ZAMFARA INTERNATIONAL JOURNAL OF EDUCATION (ZIJE)

Volume 5, Number 3, July, 2025

pISSN(Hard Copy): 2814-1377 eISSN (Online Copy): 2814-1369

Volume 5, Number 3, July, 2025
The Official Journal of The Faculty of Education
Federal University Gusau, Zamfara State

DOI: http//doi.org/10.64348/zije.202554
www.foefugusau.com.ng

ZAMFARA INTERNATIONAL JOURNAL OF EDUCATION (ZIJE) Volume 5 Number 3, July, 2025

Published By:
Faculty of Education
Federal University Gusau, Zamfara State

PRINTED BY: MABRUQ GLOBAL LINK
08039366532

ZAMFARA INTERNATIONAL JOURNAL OF EDUCATION (ZIJE)

A PUBLICATION OF THE FACULTY OF EDUCATION,
FEDERAL UNIVERSITY GUSAU, ZAMFARA STATE, NIGERIA
VOLUME 5, NUMBER 3, JULY, 2025
PISSN: 2814-1377, eISSN: 2814-1369

INDEXED IN:

OpenAIRE

The Official Indexing Partner of the European Commission (EU),

Google Scholar

https: https://doi.org/10.64348/zije.202554

Website: www.foefugusau.com.ng,
E-mail: zijefugusau@gmail.com

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202578

EDITORIAL BOARD MEMBERS

Editor-In-Chief/chairman	***Associate Professor Umar Sodangi***
Editorial Board	Dean, Faculty of Education, Federal University Gusau
Associate Editor	***Prof. Bashir Suleiman***
	Department of Science Education, Federal University Gusau
Publication Editor	***Prof. Abubakar Sadiq Haruna***
	Department of Educational Foundations, Federal University Gusau
Assistant Publication Editor	***Dr. Yakubu A. Abdullahi***
	Department of Science Education, Federal University Gusau
Editor	***Professor Amos Shaibu***
	Department of Science Education, Federal University Gusau
Editor	***Professor Abubakar A. Bagudo***
	Department of Education & Extension Services, Usmanu Danfodiyo University, Sokoto
Editor	***Associate Professor Sheu Adaramaja Lukman***
	Department of Educational Foundations, Federal University Gusau
Editor	***Dr. Nuhu Ishaq Lawal***
	Department of Science Education, Federal University Gusau
Secretary, Editorial Board	***Halima Kaoje***
	Faculty Officer, Faculty of Education, Federal University Gusau

CONSULTING EDITORS

Professor A. A. Salawu	Usmanu Danfodiyo University, Sokoto
Professor Victor O. Awonusi	University of Lagos, Lagos State
Professor A. K. Tukur	Usmanu Danfodiyo University, Sokoto
Professor A. M. Atadoga	Ahmadu Bello University, Zaria, Kaduna State
Professor K. O. Usman	University of Nigeria, Nsukka, Enugu State
Professor Henry Owolabi	University of Ilorin, Ilorin Kwara State
Professor Muhammad Abdullahi	Bayero University Kano
Professor Yusuf A. Maigida	University of Port Harcourt
Professor Auwal M. Lawal	Bayero University Kano
Professor Sani Ibrahim	Ahmadu Bello University, Zaria, Kaduna State
Professor M. S. Magaji	Maryam Abacha American University of Nigeria, Maradi

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202578

EDITORIAL NOTE

Zamfara International Journal of Education (ZIJE) is the official Journal of the Faculty of Education, Federal University Gusau Zamfara State, Nigeria. The Journal publishes articles of diverse fields of interest in Education. Papers reporting original research and extended version of already established conference and journal articles are welcomed. Papers for publication are selected through peer review process to ensure originality, relevance and readability. ZIJE is Published bi-annually in June and December.

The aim and scope of the journal is to provide an academic medium and an important reference for the advancement and dissemination of information that supports high level learning, teaching and research in the fields of Education.

This edition, Volume 5, Number 3, July, 2025 is poised to present research reports in the following fields of education: Educational Foundations, Science Education, Educational Psychology, Curriculum & Instructional Technology, Guidance & Counselling, Philosophy & History of Education, Sociology of Education, Entrepreneurship education, Special and inclusive Education, Physical & Health Education Religious Education, Gender Studies, Peace & Security Education among Others. The articles in this volume are academic and professional discourse written by reputable scholars in their areas of specialization.

The Board wish to also acknowledge the efforts of the editorial members, for their ceaseless support towards successful publication of the journal. In the same vein, we acknowledge quite sincerely the assistance and support of our esteemed consulting editors for ensuring the credibility of this edition. Also, worthy of appreciation are the Authors and their immense contributions to this publication.

Associate Professor Umar Sodangi
Editor-in-Chief/ Chairman Editorial Board
Dean, Faculty of Education, Federal University Gusau

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202578

CALL FOR ARTICLES

The Zamfara International Journal of Education (ZIJE) calls for scholarly articles for review and possible publication in its next edition (Volume 5, Number 4.), ZIJE publishes articles that emphasizes on research development and application within the fields of Education. All manuscripts are reviewed by editorial review committee. Contributions must be original, not previously or simultaneously published elsewhere, and are critically reviewed before they are published. Papers, which must be written in English language, should have good grammar and proper terminologies. Hence, prospective articles are subjected to plagiarism assessment test to estimate the percentage of originality of the papers. Hence, Plagiarism threshold of ≤20% is recommended.

EDITORIAL GUIDELINES

1. Manuscripts including references, appendices, tables and diagrams should be double-spaced and single coded on A4 paper with generous margins (at least ½.5cm).
2. Title should be explicit and not more than 19 words.
3. Title page should be arranged as follows: Title, Author (s) full name, affiliation, full addresses, email addresses and phone numbers.
4. Abstract should be single line and not more than 250 words.
5. For conceptual papers, the body should have appropriate headings were necessary
6. For empirical papers, it should be presented in the following order; Introduction, Objectives of the study, Research questions and/or Hypothesis, Methodology, Results, Discussion of Findings, Conclusion and Recommendations.
7. Acknowledgement (if any)
8. Quotations of more than 40 words should be indented and typed single spacing with indication of the pages where the quotes were lifted
9. In-text citations should follow APA 7th edition format
10. References should be in range with 7th edition of APA style
11. Each table and figures should be presented within the manuscripts, with a brief and self-explanatory title
12. All text within the table should be clearly eligible, and all graphics and legends should be easily distinguished when printed in black and white
13. Tables should be in in horizontal line only, with only blank space to separate column
14. Tables and figures that may be included in the main text of the paper should be numbered separately, in the sequence that they are mentioned in the text.
15. Figures should be saved in a neutral data format such as JPEG, TIFF OR EPS.

SUBMISSION OF MANUSCRIPTS & ASSESSMENT FEE

Manuscripts for Volume 5. Number 4, with an evidence of a non-refundable assessment fee of five thousand Naira (N5000:00) only per manuscript should be forwarded electronically to the Editor-In-Chief or Publication Editor via; **zijefugusau@gmail.com** on or before August 31st, 2025. Furthermore, upon acceptance of manuscript for publication a non-refundable publication fee of Thirty Thousand Naira (N30, 000:00) will be required for online (e-Book) version only, while Forty Thousand Naira (40,000:00) only for both online (e-Book) and hard copy versions per manuscripts, respectively.

Professor Abubakar Sadiq Haruna
Publication Editor

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202578

TABLE OF CONTENTS

S/N	Authors, Paper Title and DOI Index	Pages
1	**SULAIMAN, B. & MAFINDI, F. S. (2025).** Assessment of Digital Literacy Skills on Autonomous Learning Practices among Undergraduate Students of Ahmadu Bello University, Zaria, Kaduna State https://doi.org/10.64348/zije.202522	**1-6**
2	**ONYEKPE, S. J. & ESEGBUE, E. (2025).** Assessment on integration of Artificial intelligence in Assessment and Research activities among University Lecturers in South-South, Nigeria https://doi.org/10.64348/zije.202523	**7-14**
3	**MUHAMMAD, B. A. & SANI, A. G. (2025).** Understanding Introversion and Extroversion in Ensuring Quality Education Amidst Insecurity Among Senior Secondary School Students in Zamfara State, Nigeria https://doi.org/10.64348/zije.202524	**15-23**
4	**NMADU, U. E., GANA, E. & MAITURE, G. R. (2025).** Assessment of Access to Educational Support through Scholarship Opportunities among Christians and Muslims Students in Niger State, Nigeria https://doi.org/10.64348/zije.202525	**24-29**
5	**ABUBAKAR, A. S. (2025).** Qualitative Study on Integrating Cooperative Learning Instructional Strategy for Science Education Teaching in Nigeria: A Philosophical Review https://doi.org/10.64348/zije.202526	**30-34**
6	**ATTAHIRU, Y., MUSA, M. S., SANI, M. M., ATTAHIRU, B. & ABBA, H. (2025).** Effective Guidance and Counselling Program: A Panacea for Prevention of Insecurity in Zamfara State, Nigeria https://doi.org/10.64348/zije.202527	**35-41**
7	**MUHAMMED, S. A. & AREMU, A. T. (2025).** Correlation Between Examination Anxiety and Academic Performance in Arabic Language Studies among Undergraduate University Students in Kwara State, Nigeria https://doi.org/10.64348/zije.202528	**42-48**
8	A**BUBAKAR, S., BASHIR, S. & NUHU, I. L. (2025).** Effect of Problem-Based Strategy on Performance in Algebra among Lower Basic Education Pupils in Zamfara State, Nigeria. https://doi.org/10.64348/zije.202529	**49-53**
9	**ABUBAKAR, S. R. (2025).** Critical Assessment of English Language Students Performance in Senior Secondary School Certificate Examination: A Systematic Review of West African Examination Council, 2015-2023 https://doi.org/10.64348/zije.202530	**54-59**
10	**FELIX, T. B., MATHEW, O. O. & BENJAMIN, T. S. (2025).** Assessment of Material Resource Management Practices and Administration of Public Universities in South-South, Nigeria https://doi.org/10.64348/zije.202531	**60-65**
11	**YAKUBU, A. M., KOLAWOLE, S. A. & RAFIU, A. A. (2025).** Effect of Token Economy Counselling Technique on Truancy Behavior among Primary School Pupils in Ado-Odo Ota Local Government Area, Ogun State https://doi.org/10.64348/zije.202532	**66-71**
12	**LAWAL, A. M., ANAS, A., MUHAMMAD, B., HARUNA, A. S. & NUHU, U. (2025).** Ensuring Access, Equity and Quality of Guidance and Counselling Education amidst Insecurity in Nigeria: Challenges and Strategic Interventions https://doi.org/10.64348/zije.202533	**72-76**
13	**AKPOKIERE, R. U., NIYI, O. O. & SALIHU, H. (2025).** Perception of Teachers on Integration of Indigenous Languages for Basic Science and Mathematics Teaching in Niger State, Nigeria https://doi.org/10.64348/zije.202534	**77-83**
14	**NATHANIEL, O. & IMRANA, S. P. (2025).** Access, Equity and Quality of Education in the Face of Insecurity in Nigeria: Implications on School Administration https://doi.org/10.64348/zije.202535	**84-89**

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202578

15	**EZEAGHASI, N. E. & OBOCHI, U. M. (2025).** Impact of Generative-Artificial-Intelligence Strategy on Retention and Performance in Biology among Federal University of Education Zaria Students, Kaduna state, Nigeria https://doi.org/10.64348/zije.202536	**90-96**
16	**UMEH, C. B., HILLARY, E. Z. & KUCHAKS, D. P. (2025).** Impact of Christian Educators on integration of Artificial Intelligence-Enhanced learning using Faith-Based values among Christians in Kaduna state, Nigeria https://doi.org/10.64348/zije.202537	**97-102**
17	**UGADUH, L. C., EZE, M. C. & OLATUNJI, S. O. (2025).** Qualitative Study on Language Influence and Integration of Multilingualism in Teaching and Learning of English Language Studies in Nigeria https://doi.org/10.64348/zije.202538	**103-109**
18	**AKPAN, A. O., UMANAH, F. I. & ABASI, A. U. (2025).** Effects of Virtual-Field-Trip and Field-Experience Strategies on Performance in Air Pollution among College of Education Students in Akwa Ibom State, Nigeria https://doi.org/10.64348/zije.202539	**110-117**
19	**KABIR, S. & UMEAKUKA, O. A. (2025).** Qualitative Study on Access to Sport Participation: A Panacea for Reducing Insecurity in Nigeria https://doi.org/10.64348/zije.202540	**118-122**
20	**SALISU, M. & ALAFIATAYO, B. M. (2025).** Correlation Between Perception and Satisfaction of ChatGPT Applications in Biology Learning among Undergraduate Students in Federal University of Education, Zaria https://doi.org/10.64348/zije.202541	**123-128**
21	**OGUNJE, B. F., TUKURA, C. S., SOBOWALE, F. M. & DAVID, M. (2025).** Qualitative Study on Integration of Biometric-Based System for Monitoring Students' Lecture Attendance among Higher Institutions in North-Central, Nigeria https://doi.org/10.64348/zije.202542	**129-134**
22	**HARUNA, A. S., ABDULWAHAB, I., AMINU, U. & AUWALU, R. (2025).** Quality of Guidance and Counseling Education in the Face of Insecurity in Public Schools in Nigeria https://doi.org/10.64348/zije.202543	**135-139**
23	**HILLARY, E. Z., ISHAYA, D., MUSA, H. & BITRUS, C. B. (2025).** Assessing the Impact of Social Media platforms on Dissemination of Christian Religious Messages in Kaduna State, Nigeria https://doi.org/10.64348/zije.202544	**140-145**
24	**SAIDU, H. T., MUSAPHA, I. A. & YUSUF, M. K. (2025).** Effect of Systematic-Desensitization-Counselling Technique on Social Anxiety among Secondary School Students in Nassarawa Zonal Education Directorate, Kano State, Nigeria https://doi.org/10.64348/zije.202545	**146-153**
25	**HARUNA, A. S., NAMADI, A. & MUHAMMAD, R. A. (2025).** Impact of Cognitive Restructuring Counselling Technique in Addressing Menace of Drug Abuse and Insecurity in Gusau Metropolis, Zamfara State, Nigeria https://doi.org/10.64348/zije.202546	**154-156**
26	**IRABOR, B. P., MUHAMMAD, D. & SAIDU, M. F. (2025).** Ahmadu Bello's Philosophy of Education: A Pragmatic Approach to National Development in Nigeria https://doi.org/10.64348/zije.202547	**157-167**
27	**JANGEBE, F. Z. & SANI, A. G. (2025).** Quality Education amidst Insecurity: The Place of Deep and Surface Learning Approaches for Quality Learning in Nigerian Secondary Schools https://doi.org/10.64348/zije.202548	**168-171**
28	**ADEDUGBE, B. O., OSENI, A. O. & MATINHOUNKPON, G. S. (2025).** Awareness of Hepatitis among Pregnant Women in Akoko South-West Local Government Area, Ondo State, Nigeria https://doi.org/10.64348/zije.202549	**172-178**

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202578

29	**BASHIRU, A. & HARUNA, A. S. (2025).** Influence of Insecurity on Relationship among Tertiary Education Students. A Case Study of Zamfara State College of Education, Maru, Zamfara State, Nigeria https://doi.org/10.64348/zije.202550	**179-183**
30	**MAMMAN, G. (2025).** Effect of Peer-Tutoring Strategy on Performance in Basic Science Concepts among Secondary School Students in Zaria Education Zone, Kaduna State, Nigeria https://doi.org/10.64348/zije.202551	**184-189**
31	**BADAMASI, B., GALADIMA, Y., ABDULKARIM, J. M., ALIYU, J. U., UMAR, R. & HOSEA, F. (2025).** Qualitative Study on Advancing Information Access: The Role of Information Retrieval Systems in Enhancing Digital User Experience https://doi.org/10.64348/zije.202555	**190-195**
32	**BELLO, J. A., MOYI, H. & GINGA, A. U. (2025).** Effect of Blended Instructional Strategy on Achievement and Misconceptions in Mathematics Concepts among Secondary School Students in Sokoto State, Nigeria https://doi.org/10.64348/zije.202556	**196-201**
33	**ABDULLAHI, H. A., MARKUS, T., EMAIKWU, G. (2025).** Assessment of integrating Disruptive Technology Tools on Accounting Education Curriculum among Public Universities in Northern Nigeria https://doi.org/10.64348/zije.202557	**202-208**
34	**OMOYAJOWO, B. S. & BAMBI, B. I. (2025).** Qualitative Study on Integration of Artificial Intelligence for Self-Regulated Learning among Higher Institutions of Learning in Nigeria: Rethinking Learner Autonomy https://doi.org/10.64348/zije.202558	**209-216**
35	**OLAIYA, S. M., AJALA, I. R., AZEEZ, S. Q., TAIWO, E. A. & ADETOLUWA, O. O. (2025).** Effect of Board Games on Achievement in Social Studies Concept among Public Primary School Pupils in Osun State, Nigeria https://doi.org/10.64348/zije.202559	**217-225**
36	**YUSUF, Z. (2025).** Qualitative Study on Integrating Policies, Practices and Pedagogy on Inclusive Education among Preservice Teacher Training Programs in Nigeria https://doi.org/10.64348/zije.202560	**226-229**
37	**GARBA, A. L., AHMAD, K. & DAJO, U. (2025).** Qualitative Study on The Role of Schools as a Social Institution in Nigeria https://doi.org/10.64348/zije.202561	**230-235**
38	**MOHAMMED, B. & ABDULLAHI, B. Z. (2025).** Impact of Problem-Focused Coping Strategy Using Active Coping Strategy among Victims of Fire Disaster in Maiduguri Monday Market, Borno State https://doi.org/10.64348/zije.202562	**236-242**
39	**AGBONGIASEDE, C. K. & EVANS, O. C. (2025).** Assessment of Comparative Education Practices among Federal University Administrators for Sustainable Development in Nigeria https://doi.org/10.64348/zije.202563	**243-250**
40	**KOTSO, J. A. (2025).** Qualitative Study on Integration of Artificial Intelligence Technology among Tertiary Institution Libraries in Nigeria: Opportunities and Ethical Considerations https://doi.org/10.64348/zije.202564	**251-257**
41	**BIU, A. A., AKOREDE, A. A. & ISIAQ, A. T. (2025).** Effect of Health Education Intervention Programs on Emergency Contraceptives Awareness among University Undergraduate Female Students in Jigawa State, Nigeria https://doi.org/10.64348/zije.202565	**258-265**
42	**FWANGLE, I. I., MANKILIK, M. & USMAN, I. S. (2025).** Assessment of Teachers' Perception of Artificial Intelligence Technology on Academic Achievement in Physics among Secondary Schools in Plateau State, Nigeria https://doi.org/10.64348/zije.202566	**266-272**

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202578

43	**BABANGIDA, A. K. & BASHIR, S. (2025).** Effect of Polya's Problem-Solving Model on performance in Respiration Concept among Secondary School Students in Zamfara State, Nigeria https://doi.org/10.64348/zije.202567	**273-279**
44	**ABDULRAHMAN, A. A., IBRAHIM, N. T., BELLO, S. & ALIYU, F. (2025).** Impact of Augmented-Reality Strategy on Engagement and Performance in Cell Biology Concepts among Secondary School Students in Sokoto State, Nigeria https://doi.org/10.64348/zije.202568	**280-286**
45	**SANI, M. B., ALIYU, Z., FAGGE, A. M. & BAKO, H. (2025).** Impact of Blockchain-Integrated Instruction on Awareness and Attitude in Science and Mathematics Education among Secondary School Students in Zaria, Kaduna State https://doi.org/10.64348/zije.202569	**287-293**
46	**IDRIS, I. O. & RABIU, A. T. (2025).** Effects of Gagne's Instructional Strategy on Retention in Mathematics among Senior Secondary School Students in Kogi State, Nigeria https://doi.org/10.64348/zije.202570	**294-299**
47	**ANASO, J. N. & ANASO, C. P. (2025).** Assessment on Integrating Artificial Intelligence Technological and Pedagogical Competencies among Secondary School Chemistry Teachers in Kaduna State, Nigeria https://doi.org/10.64348/zije.202571	**300-306**
48	**YUSUF, N. A. (2025).** Effects of Cognitive-Restructuring-Counselling Technique and Token Economy on School-Refusal Behavior among Secondary School Students in Gwale, Kano State, Nigeria https://doi.org/10.64348/zije.202572	**307-314**
49	**SULAIMAN, M. & OTHMAN, N. S. (2025).** Comparative Analysis Between Socio-Demographic, Behavioral, Environmental and Socio-Economic Factors on Academic Performance of Students at Tertiary Level of Education in Nigeria https://doi.org/10.64348/zije.202573	**315-324**
50	**MOHAMMED, A. K., ABBA, R. & IHIOSOTA, C. J. E. (2025).** Access, Equity and Quality of Early Childhood Education in The Face of Insecurity in Northwest Nigeria https://doi.org/10.64348/zije.202574	**325-330**
51	**NUHU, P. & SARKIN-FADA, M. A. (2025).** Perception of Students on Impact of Social Studies Curriculum in Addressing Secretive Fraternities among Colleges of Educations in Adamawa State, Nigeria https://doi.org/10.64348/zije.202575	**331-337**
52	**USAINI, J. & BASIRU, M. (2025).** Effects of Computer-Aided Instruction on Attitude and Performance in Family Health Concepts among Upper Basic Students in Sabon Gari, Kaduna State, Nigeria https://doi.org/10.64348/zije.202576	**338-343**
53	**JOSIAH, O. O. & OGUOKO, R. A. (2025).** Assessment of Biology Content Knowledge on Academic Performance among Senior Secondary Schools in Kwara State, Nigeria https://doi.org/10.64348/zije.202577	**344-350**

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202522

Assessment of Digital Literacy Skills on Autonomous Learning Practices among Undergraduate Students of Ahmadu Bello University, Zaria, Kaduna State.

SULAIMAN, Balarabe[1]
Sulaimanbalarabe26@gmail.com
+2348037025479
&
MAFINDI, Farida Sanusi[2]
sebosanusi73@gmail.com
+2348035861059

[1]Department of English Language, School of Languages, Federal University of Education, Zaria
[2]Department of Arts and Social Science Education, Faculty of Education, Ahmadu Bello University, Zaria

Abstract
In today's digital age, the integration of digital literacy skills into English as a Second Language (ESL) education has transformed the way learners acquire and engage with language. This research explores the extent to which digital literacy skills can serve as a catalyst for fostering autonomous learning practices among 100 level ESL students. Autonomous learning skills, characterized by learner independence, self-regulation, and motivation, has become increasingly relevant in educational discourse, especially with the widespread adoption of digital tools and platforms. Digital literacy skills encompass the skills and competencies required to effectively use digital technologies, including information retrieval, communication, collaboration, and content creation. Through a descriptive survey design, involving questionnaire, the study evaluates the difference in digital literacy skills levels and their autonomy in language learning practices between ESL students'. The population of the study are all undergraduate ESL students in the Faculty of Education, Ahmadu Bello University Zaria with a total of 121 as at 2024/25 academic session. The sample used in this study were forty 100Level students. The instrument was validated, pilot tested and the reliability coefficient of 0.86 and 0.92 were obtained using Cronbach's alpha. Two research questions and two null hypotheses were formulated and tested using means and standard deviations and one-sample t-test. The findings revealed that there was a significant difference in the Digital Literacy Skills and Autonomous Learning Practices of 100 level ESL. The research concludes by recommending strategies for educators to scaffold digital literacy skills and improved Autonomous learning practices in a way that empowers ESL learners to become proactive, self-directed learners.
Keyword: Digital literacy, Learning, Technology, Language Education

Introduction
The 21st century has ushered in a new era of teaching and learning, driven by rapid advancements in digital technology. In the realm of English as a Second Language (ESL) education, the traditional teacher-centered model is being reshaped by learner-centered, technology-supported environments. Central to this transformation is the concept of digital literacy skills the ability to effectively and responsibly use digital tools to access, evaluate, create, and communicate information. With the growing digitalization of educational resources, digital literacy skills are no longer optional; they have become an essential component of modern language education.

Autonomous learning refers to a learner's capacity to take responsibility for their own learning journey. This involves goal-setting, self-monitoring, and reflecting on learning outcomes. Research has consistently demonstrated that learners who exhibit autonomous behavior are more likely to persist in language learning, achieve better results, and transfer skills across contexts (Little, 2007; Benson, 2021). In ESL classrooms, autonomy is especially critical due to the diverse needs, backgrounds, and language proficiencies of learners. When digital literacy skills are effectively integrated into instruction, they empower learners with the tools and confidence to pursue learning beyond the classroom.

Despite growing interest in digital and autonomous learning, the link between these two educational constructs in the context of ESL remains underexplored. While many ESL students are digital natives, this does not automatically equate to digital literacy skills. Without intentional guidance and structured learning environments, students may struggle to use digital tools productively for language acquisition. This study addresses this gap by examining how digital literacy skills can be a catalyst

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202522

for autonomous learning in the ESL classroom. It aims to identify which aspects of digital competence most significantly influence learner independence, and how educators can support the development of both. This is particularly important in a post-pandemic era, where remote and blended learning have become central to educational delivery. Understanding this relationship will contribute to more effective pedagogical strategies that align with the digital realities of today's ESL learners.

Defining Digital Literacy Skills

Digital literacy is "the set of social practices required to meaningfully engage with digital technologies in varied contexts, critically assessing and creating content rather than simply consuming it.' (Pangrazio & Sefton-Green, 2021). Recent definitions have evolved to reflect technological advancements and the multidimensional nature of digital literacy. Ng (2012) expands this to include cognitive, technical, and social-emotional dimensions, acknowledging that digital literacy skills involve more than mere technical competence. More recently, van Laar et al. (2020) emphasize the inclusion of critical thinking, problem-solving, and collaboration as integral to digital literacy in educational contexts.

Digital Tools and Learner Autonomy in ESL Education

In language education, digital tools offer numerous affordances for learner autonomy. It emphasizes critical engagement with digital content and independent learning practices essential for second language acquisition. According to Eshet-Alkalai and Chajut (2021) stated that digital literacy entails the integration of cognitive, technical, and critical literacy skills needed for learners to navigate and produce digital texts such as e-books, online articles, videos, and interactive narratives while engaging in ethical and thoughtful communication in virtual academic and social spaces. Benson (2021) identifies autonomy as both a psychological and practical construct, nurtured through access to tools that allow learners to take control of their learning paths. Blogs, online portfolios, and e-learning platforms are particularly instrumental in enabling learners to self-regulate, reflect, and evaluate their progress. Reinders and White (2011) contend that technology-facilitated environments promote self-directed learning by offering flexible, goal-oriented tools. However, they caution that autonomy does not arise automatically; structured support and digital literacy skills training are essential. Godwin-Jones (2022) echoes this caution, observing that many learners misuse technology or lack the skills to engage with it critically and meaningfully.

Bridging Digital Literacy and Autonomy in the ESL Context

In the context of ESL education, integrating digital literacy skills with autonomy can significantly enhance language learning outcomes. As noted by Murray and Lamb (2018), fostering digital literacy empowers students to independently access diverse resources, enhancing their capacity for lifelong learning. Moreover, O'Dowd (2021) highlights that digital platforms enable cross-cultural exchanges, fostering both language acquisition and global competence. However, these benefits are contingent upon deliberate instructional design and ongoing support. The integration of digital literacy skills into ESL education is not merely an enhancement but a necessity in the digital age. By equipping learners with these skills, educators can foster greater autonomy, enabling students to take control of their language learning journeys. This symbiotic relationship between digital literacy and autonomy holds promise for addressing the diverse needs of ESL learners, particularly in the post-pandemic era characterized by remote and blended learning modalities. Although ESL learners have increasing access to digital tools, many lacks the digital literacy Skills needed effectively for autonomous learning practices. The absence of structured digital literacy skills education within ESL programs limits students' capacity to take charge of their learning. This research seeks to explore how digital literacy skills contributes to learner autonomy practices in ESL classrooms in fostering independent learning behaviors through technology

Objectives of the study

1. To find out the Digital Literacy Skills of 100 level ESL students of Ahmadu Bello University, Zaria
2. To determine the Autonomous Learning Practices of 100 level ESL students of Ahmadu Bello University, Zaria?

Research Questions

1. What is the difference in the Digital Literacy Skills of 100 level ESL students of Ahmadu Bello University, Zaria?
2. What is the difference in the Autonomous Learning Practices of 100 level ESL students of Ahmadu Bello University, Zaria?

Hypotheses

H_{01}: There is no significant difference in the Digital Literacy Skills of 100-level ESL students in Ahmadu Bello University, Zaria.

H_{02}: There is no significant difference in the Autonomous Learning Practices of 100-level ESL students in Ahmadu Bello University, Zaria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202522

Methodology

The study adopts a one-shot survey design which is suitable for examining difference among a given set of subjects in a natural educational setting without manipulation. This design allows the researcher to gather quantitative data to provide a holistic understanding of students' level of Digital Literacy of ESL learners' and how it helps them in their Autonomous Learning Practices. The target population comprises of all undergraduate ESL students of the Ahmadu Ballo University Zaria. There are 121 students from 100-400 level who are studying ESL. The accessible population are the 100 Level ESL students with basic access to Digital Technologies. There are 40 students in that level who served as the sample for the study. A structured questionnaire was used to measure students' Digital Literacy Skills and the level of their Autonomous Learning Practices. The questionnaire consisted of closed-ended items A, B and C Section A focused on students. The questionnaire was divided into three sections; Section A, B, and C. Section A is about the students Demographic Information, Section B is on Digital demographic information; section B, assessed digital literacy skills; and section C examined autonomous learning practices. The instrument was validated by experts in Language and ICT skills. In order to further validate the instrument, it was pilot tested and the internal consistency of the items was computed through Cronbach's Alpha. The reliability indices obtained for section B and C are 0.86 and 0.92, respectively. The instrument was given to the students and retrieved within 30 minutes. The data collected was coded and subjected to analysis through appropriate tools. The data was analyzed using descriptive statistics (mean and standard deviation) to answer the research questions and inferential statistics (one-sample t-test) to test the null hypothesis at 0.05 level of significance

Presentation of Results

Research Question One

What is the difference in the Digital Literacy Skills of 100 level ESL students of Ahmadu Bello University, Zaria? This research question was answered using descriptive statistics of mean and standard deviation. A decision mean of 2.50 will be considered to show level of the possession of Digital Literacy Skills of the 100 Level Students. The result of the analysis is presented in Table 1.

Table 1: Means and Standard Deviations on Digital Literacy Skills of 100 level ESL students of Ahmadu Bello University, Zaria.

Statement	Mean	SD
I use search engines (like Google) to find information in English.	4.73	.816
I can solve technical problems on my device without help.	4.33	1.095
I can evaluate if online information is true or useful.	4.15	.975
I use apps or websites (like Duolingo or YouTube) to learn English.	4.13	.939
I know how to protect my personal information online.	3.98	1.074
I collaborate with classmates online to learn or complete assignments.	3.95	1.300
I can write emails, messages, or comments in English using proper grammar.	3.90	1.317
I use digital dictionaries or translation tools to understand English words.	3.75	1.428
I participate in online learning platforms or school portals.	3.70	1.454
I can create or edit digital content (like a blog post or video) in English.	3.63	1.334
Aggregate	**4.03**	**1.173**

Table 1 presents the means and Standard Deviations of Digital Literacy Skills possessed by 100 Level Students in Ahmadu Bello University Zaria. The Skills are presented in a Descending order of magnitude. The Skill that is most possessed by majority of the students is that they use search engines (like Google) to find information in English with a mean and standard deviation of (M=4.73, SD=0.816, followed by ability to solve technical problems on their devices without any help with (M=4.33, SD=1.095). The least amongst the skills are that the students create or edit digital content (like a blog post or video) in English and they can participate in online learning platforms or school portals with means and standard deviations of (M=3.63, SD=1.334) and (M=3.70, SD=1.454), respectively. The overall mean and standard deviation are (M=4.03, SD=1.173). This shows that on the overall, the whole 100 Level TESL Students are not different in the way they always use their Digital Literacy Skills.

Research Question Two

What is the difference in the Autonomous Learning Practices of 100 level ESL students of Ahmadu Bello University, Zaria? This research question was answered using descriptive statistics of mean and standard deviation. The result of the analysis is presented in Table 2.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202522

Table 2: Means and Standard Deviations on Autonomous Learning Practices of 100 level ESL students of Ahmadu Bello University, Zaria.

Statement	Mean	SD
I enjoy learning English on my own using digital tools.	4.48	.751
I look for new ways to practice English outside the classroom.	4.38	1.005
I set personal goals for improving my English skills.	4.30	1.159
I feel confident managing my own English learning process without depending on the teacher all the time.	4.17	1.035
I reflect on what I learn and try to improve.	4.10	1.150
Aggregate	**4.29**	**1.02**

Table 2 presents the means and Standard Deviations of Autonomous Learning Practices possessed by 100 Level Students in Ahmadu Bello University Zaria. The Practices are presented in a Descending order of magnitude. The Practice that is most possessed by majority of the students is that they enjoy learning English on their own using digital tools with a mean and standard deviation of (M=4.48, SD=0.751, followed by looking for new ways to practice English outside the classroom with (M=4.38, SD=1.005). The least amongst the practices are that the students reflect on what they learn and try to improve and they feel confident managing their own English learning process without depending on the teacher all the time with means and standard deviations of (M=4.10, SD=1.150) and (M=4.17, SD=1.035), respectively. The overall mean and standard deviation are (M=4.29, SD=1.02). This shows that on the overall, the whole 100 Level TESL Students are not different in the way they always apply their Autonomous Learning Practices.

Null Hypothesis One

There is no significant difference in the Digital Literacy Skills of 100 level ESL students of Ahmadu Bello University, Zaria. This null hypothesis was tested using one-sample t-test at α=0.05 level of significance. The initial test value (assumed mean) was 0. The result of the analysis is presented in Table 3.

Table 3: Summary of one-sample t-test analysis on the Digital Literacy Skills of 100 level ESL students of Ahmadu Bello University, Zaria.

								95% Confidence Interval of the Difference	
N	Mean	SD	Std. Error Mean	T	df	p	Mean Difference	Lower	Upper
40	40.23	4.610	.729	55.181	39	.000	40.225	38.75	41.70

Table 3 presents summary of one-sample t-test in the Digital Literacy Skills of 100 level ESL students. The result revealed that t(39)=55.181, p=0.001; the null hypothesis which stated no significant difference was rejected. Therefore, there was a significant difference in the Digital Literacy Skills of 100 level ESL students.

Null Hypothesis Two

There is no significant difference in the Autonomous Learning Practices of 100 level ESL students of Ahmadu Bello University, Zaria. This null hypothesis was tested using one-sample t-test at α=0.05 level of significance. The initial test value (assumed mean) was 0The result of the analysis is presented in Table 4.

Table 4: Summary of one-sample t-test analysis on the Autonomous Learning Practices of 100 level ESL students of Ahmadu Bello University, Zaria

								95% Confidence Interval of the Difference	
N	Mean	SD	Std. Error Mean	t	Df	p	Mean Difference	Lower	Upper
40	21.43	2.601	.411	52.103	39	.000	21.425	20.59	22.26

Table 4 presents summary of one-sample t-test in the Autonomous Learning Practices of 100 level ESL students. The result revealed that t(39)=52.103, p=0.001; the null hypothesis which stated no significant difference was rejected. Therefore, there was a significant difference in the Autonomous Learning Practices of 100 level ESL students.

Findings

1. There was a significant difference in the Digital Literacy Skills of 100 level ESL students of Ahmadu Bello University, Zaria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202522

2. There was a significant difference in the Autonomous Learning Practices of 100 level ESL students of Ahmadu Bello University, Zaria.

Discussion of Findings

The findings confirm that digital literacy skills play a critical role in promoting autonomous learning in ESL contexts. This aligns with previous studies (e.g., Reinders & White, 2011; Benson, 2011), which emphasized the importance of technology in enabling learner independence. The strong correlation observed supports the notion that equipping students with digital skills directly influences their ability to set goals, evaluate progress, and continue learning outside the classroom. Interestingly, while many students reported regular use of digital tools, not all demonstrated equal levels of autonomy, suggesting the need for guided use and structured integration of digital tools in teaching. The findings revealed a high level of digital literacy skills among 100-level ESL students, as evidenced by high mean scores across core indicators such as using search engines (M = 4.73), solving technical issues (M = 4.33), and evaluating online information (M = 4.15). These results corroborate Ng's (2012) framework, which views digital literacy as encompassing technical, cognitive, and social-emotional dimensions. The students' proficiency in these areas aligns with van Laar et al.'s (2020) assertion that 21st-century skills must include problem-solving and critical information evaluation. However, students exhibited comparatively lower proficiency in digital content creation (M = 3.63) and participation in structured digital learning platforms (M = 3.70). This supports Godwin-Jones (2022), who argues that being digitally exposed does not equate to educational digital fluency. Many learners remain passive consumers rather than active creators or collaborators, particularly in formal educational contexts. Similarly, Son (2011) emphasizes that learners in developing regions may lack structured training in formal academic digital tools despite general internet familiarity. The disparity observed underscores the importance of moving beyond functional digital use to academic digital engagement. This aligns with Reinders and White's (2011) findings that autonomy and effective digital usage must be cultivated through structured pedagogical support, not assumed by default. As such, while foundational digital skills are present, the findings point to a pressing need for targeted interventions that introduce students to LMS platforms, academic blogging, and collaborative technologies (Dudeney et al., 2013; Kessler, 2018).

Research Question Two: What is the difference in the Autonomous Learning Practices of 100-level ESL students in Ahmadu Bello University, Zaria?

The findings also revealed a strong presence of autonomous learning behaviors. Students scored highly on statements indicating self-directed practices, such as learning English independently using digital tools (M = 4.48), setting personal learning goals (M = 4.30), and seeking new learning opportunities outside class (M = 4.38). These patterns reflect core principles of learner autonomy as described by Benson (2011) and Little (2007), who link autonomy to goal-setting, self-monitoring, and motivation. Nonetheless, the slightly lower scores for reflective practice (M = 4.10) and self-confidence without teacher dependency (M = 4.17) suggest an area where autonomy is still emerging. According to Lee (2016), while learners may engage in autonomous activities, deep autonomy also involves metacognitive awareness reflecting on progress and adjusting strategies accordingly. The positive correlation between digital literacy and autonomous learning observed in this study mirrors the position of Murray and Lamb (2018), who argue that digital tools are catalysts for autonomy when used meaningfully. However, both Reinders and White (2011) and O'Dowd (2021) caution that autonomy is not a guaranteed outcome of digital access; intentional instructional scaffolding is essential.

Conclusion

The findings of this study underscore the importance of digital literacy skills in fostering autonomous learning practices among ESL students. The descriptive and inferential analyses revealed that 100-level ESL students at Ahmadu Bello University, Zaria, possess a relatively high level of digital literacy, particularly in navigating search engines, accessing information, and resolving technical issues. However, the findings also indicate that students are less proficient in formal educational digital tasks, such as creating content or using structured learning platforms. Similarly, the students demonstrated strong autonomous learning tendencies, such as setting personal goals, engaging in self-study, and seeking learning opportunities outside the classroom. These results affirm that digital literacy and autonomy are interconnected, and that enhancing students' digital capabilities contributes significantly to their ability to take ownership of their learning. The study highlights the need for structured integration of digital tools into ESL pedagogy to bridge the gap between basic digital familiarity and educational digital fluency. Therefore, equipping students with both the skills and confidence to use technology meaningfully is essential for cultivating a generation of self-directed, lifelong learners in language education

Recommendations

1. ESL programs should incorporate modular digital literacy courses that emphasize both general and academic digital tool usage, aligning with the skills highlighted in the first research question.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202522

2. Educational technology activities such as blogging, digital storytelling, and collaborative projects should be introduced to build students' creative and reflective digital capacities in line with their observed limitations in content creation.

Acknowledgements

The researchers express sincere gratitude to the, Federal University of Education, Zaria, for the academic guidance, institutional support, and enabling environment that contributed immensely to the successful execution of this study. The researchers also appreciate the Department of Arts and Social Science Education, Ahmadu Bello University, Zaria, for granting access to relevant materials and participants, and for their collaboration throughout the research process. Special thanks go to the lecturers and students of the 100-level ESL class at Ahmadu Bello University, Zaria, whose cooperation and responses provided the empirical foundation of this work. Lastly, the researchers acknowledge the valuable input of language education and ICT experts who validated the research instrument and provided constructive guidance during its design and pilot testing phase

References

Benson, P. (2011). Teaching and researching autonomy in language learning (2nd ed.). Routledge.

Benson, P. (2021). Learner autonomy. In C. A. Chapelle (Ed.). The Encyclopedia of Applied Linguistics (1–6). Wiley

Coiro, J., Knobel, M., Lankshear, C., & Leu, D. J. (Eds.). (2014). Handbook of research on new literacies. Routledge.

Dudeney, G., Hockly, N., & Pegrum, M. (2013). *Digital literacies: Research and resources in language teaching*. Routledge.

Eshet-Alkalai, Y., & Chajut, E. (2021). You can teach an old dog new tricks: The effectiveness of digital literacy training in older adults. Educational Gerontology, 47(6), 276–287.

Godwin-Jones, R. (2022). Digital tools for autonomous language learning. *Language Learning & Technology*, 26(1), 1–16.

Kessler, G. (2018). Technology and the future of language teaching. *Foreign Language Annals*, 51(1), 205–218.

Lai, C. (2017). Autonomous language learning with technology: Beyond the classroom. The *Journal of Language Teaching and Learning*, 7(1), 1–15.

Lankshear, C., & Knobel, M. (2015). *Digital literacies: Concepts, policies and practices* (2nd ed.). Peter Lang.

Lee, L. (2016). Autonomous learning through task-based instruction in fully online language courses. *Language Learning & Technology*, 20(2), 81–97.

Little, D. (2007). Language learner autonomy: Some fundamental considerations revisited. *Innovation in Language Learning and Teaching*, 1(1), 14–29.

Murray, G., & Lamb, T. (2018). Space, place and autonomy in language learning. Routledge.

Ng, W. (2012). Can we teach digital natives digital literacy? *Computers & Education*, 59(3), 1065–1078.

O'Dowd, R. (2021). Online intercultural exchange and language learning. *Journal of Virtual Exchange*, 4(1), 1–19.

Pangrazio, L., & Sefton-Green, J. (2021). Digital literacies and digital epistemologies: Re-thinking digital literacy through posthumanism. *Studies in Philosophy and Education*, 40(2), 213–227.

Reinders, H., & White, C. (2011). Learner autonomy and new learning environments. Language Learning & Technology, 15(3), 1–23.

Son, J. B. (2011). Digital literacy of language learners in two different contexts. *TESOL Journal*, 2(3), 315–327.

Thomas, M. (Ed.). (2012). *Digital education: Opportunities for social collaboration.* Palgrave Macmillan.

Van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M., & de Haan, J. (2020). Determinants of 21st-century skills and 21st-century digital skills. *Computers in Human Behavior*, 108, 106385.

Zhang, W., & Zou, D. (2022). Twenty years of mobile-assisted language learning: Bibliometric analysis and res

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202523

Assessment on integration of Artificial intelligence in Assessment and Research activities among University Lecturers in South-South, Nigeria

ONYEKPE, Stephen Jacob[1]
newjacob4real@yahoo.com
onyekpestephen247@gmail.com
08062210169

ESEGBUE, Edith[2]
edith.esegbue@unidel.edu.ng
08035460942

[1]Department of Social Science Education, Faculty of Education, Delta State University, Abraka, Delta State, Nigeria.
[2]Department of Arts and Social Science Education, Faculty of Education, Ebonyi State University, Abakaliki.

Abstract
This study focused on Ethical and Intellectual Considerations in the Deployment of Artificial Intelligence in Educational Assessment and Research among Social Studies Lecturers in Universities in south-south, Nigeria. Three research questions and 3 hypotheses guided the study. The study adopted a descriptive survey research design. The study comprised of 120 Social Studies lecturers in public federal and State universities in south-south, Nigeria. A structured questionnaire was used for data collection. Data were analyzed using descriptive statistics (mean and standard deviation) to summarize responses and t-test statistics to test the hypotheses. The findings revealed among others that there was significant difference in the level of awareness regarding the responsible and ethical use of AI technologies between Social Studies lecturers in Federal and State universities. The study concluded that although AI tools offer innovative prospects for educational advancement, there is a pressing need to enhance ethical awareness and address intellectual property challenges among Social Studies lecturers. It was recommended that universities and educational authorities should organize regular training workshops, develop clear ethical guidelines, and promote responsible use of AI tools in research and assessment.
Keyword: Artificial Intelligence, Social Studies, Assessment, Research, Lecturers

Introduction
The rapid advancement and integration of Artificial Intelligence (AI) into educational practices have significantly transformed the landscape of teaching, learning, and research. AI technologies are increasingly being deployed in higher education to streamline assessment processes, enhance instructional strategies, and improve research efficiency. These innovations—ranging from automated grading and adaptive learning platforms to intelligent tutoring systems and predictive analytics—allow for real-time monitoring of students' progress and support data-informed decision-making in pedagogy and research (Reiss, 2021; Luckin, 2017; Fahimirad & Kotamjani, 2018). In Nigerian universities, there is a gradual but noticeable shift toward digital transformation in educational delivery. Some institutions seem to have started integrating AI-driven tools into teaching and research within the Social Studies discipline. Social Studies, which emphasizes civic responsibility, human relationships, and societal development, may benefit from AI's analytical power and adaptive capabilities. For lecturers, AI presents opportunities to refine assessment strategies, automate administrative tasks, and engage in innovative research practices. However, the deployment of AI in educational assessment and academic research could raise critical ethical and intellectual considerations**.** For Social Studies lecturers, these concerns are particularly relevant due to the discipline's focus on justice, equity, and civic ethics. As AI technologies permeate academic environments, questions around data privacy, algorithmic bias, transparency, authorship, and intellectual property have become more prominent and pressing (Floridi et al., 2021; Jalal et al., 2021).

Ethically, the integration of AI into assessment systems may inadvertently result in biased or opaque decisions that impact students' academic outcomes. Algorithms may reflect and reinforce existing social biases, potentially disadvantaging certain groups based on gender, ethnicity, or socioeconomic background (Shneiderman, 2020). Furthermore, many AI tools rely on the collection of extensive data—academic, behavioral, and sometimes biometric—which raises concerns about consent, data protection, and the misuse of sensitive information. These ethical dilemmas may be compounded by the lack of transparency in how AI tools operate, often referred to as the "black box" problem. When lecturers use AI systems whose decision-making processes are not fully understood or explainable, issues of accountability arise. Who is responsible when AI makes an error in

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202523

grading or misinterpreting student input during an automated assessment? Such concerns require the urgent attention of academic institutions, particularly within disciplines like Social Studies that value ethical reasoning and social justice. Recognizing these challenges, global organizations such as UNESCO have issued frameworks for the ethical use of AI.

The UNESCO recommendation on the ethics of Artificial Intelligence (2021) emphasizes principles such as fairness, accountability, and respect for human rights. However, the practical implementation of these frameworks within the Nigerian university system may appear limited. There is a critical need for localized ethical guidelines tailored to the realities of Nigerian higher education institutions. UNESCO also reported that federal institutions are more often than not exposed to training and policy frameworks that promote ethical AI usage due to better funding and infrastructural support. Intellectually, the use of AI in research by lecturers introduces new questions about ownership, attribution, and scholarly integrity. When AI tools assist in data analysis, literature review, or even content generation, it becomes essential to determine who holds authorship and intellectual property rights. Ayub and Banday (2023) argued that the increasing role of AI in content creation necessitates clear policies on how intellectual contributions are recognized and protected. For Social Studies lecturers engaged in academic research, these concerns should be crucial for maintaining credibility, originality, and adherence to academic standards. Moreover, as AI continues to reshape the research process, interdisciplinary collaboration becomes imperative. Effective AI deployment in education may require joint efforts from educators, computer scientists, ethicists, and legal professionals. In Nigerian universities, where AI literacy and digital infrastructure seems to be in infantile stage, it is essential to equip lecturers with the necessary training and awareness to navigate these complexities responsibly. Social Studies lecturers in universities occupy a strategic position in this transformation. Their perceptions, practices, and challenges regarding AI use in assessment and research provide valuable insight into the ethical and intellectual implications of these technologies. Understanding their experiences is vital for designing policies and professional development programmes that would promote the responsible and ethical use of AI in Nigerian universities. Male and female lecturers may share similar ethical concerns about the use of AI in educational assessment since both would have been aware of the core principles of AI governance and societal impact with respect to the ethical use of AI.

In conclusion, while AI could offer promising innovations for educational assessment and research, its deployment must be carefully managed to address ethical concerns such as data privacy, fairness, and transparency, as well as intellectual issues surrounding authorship and ownership.

Objectives of the study:

1. To determine the level of awareness regarding the responsible and ethical use of AI technologies among Social Studies lecturers in Federal and State universities in South-South Nigeria.
2. To examine the ethical concerns associated with the deployment of Artificial Intelligence in educational assessment among Social Studies lecturers in Federal and State universities in South-South Nigeria.
3. To investigate the intellectual property considerations involved in the use of AI tools in academic research among Social Studies lecturers in Federal and State universities in South-South Nigeria.

Research Questions:

1. What is the level of awareness regarding the responsible and ethical use of AI technologies among Social Studies lecturers in Federal and State universities in South-South Nigeria?
2. What are the ethical concerns associated with the deployment of Artificial Intelligence in educational assessment among Social Studies lecturers in Federal and State universities in South-South Nigeria?
3. What are the intellectual property considerations on the use of AI tools in academic research among Social Studies lecturers in Federal and State universities in South-South Nigeria?

Hypotheses:

Ho_1**:** There is no significant difference in the level of awareness regarding the responsible and ethical use of AI technologies between Social Studies lecturers in Federal and State universities in South-South, Nigeria.

Ho_2: There is no significant difference in the ethical concerns associated with the deployment of Artificial Intelligence in educational assessment between Social Studies lecturers in Federal and State universities in South-South, Nigeria.

Ho_3: There is no significant difference in the intellectual property considerations on the use of AI tools in academic research between Social Studies lecturers in Federal and State universities in South-South, Nigeria.

Methodology

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202523

This study adopted a descriptive survey research design. The study comprised 120 Social Studies lecturers in public federal and state universities in south-south, Nigeria. The primary instrument for data collection was a structured questionnaire. The questionnaire was designed to elicit responses on three key areas: (1) awareness of ethical AI use, (2) ethical concerns in AI deployment for assessment, and (3) intellectual property issues related to AI in academic research. It consisted of closed-ended items measured on a 4-point Likert scale: Very High Extent (4), High Extent (3), Low Extent (2), and Very Low Extent (1) for awareness and concern levels; and Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1) for opinion-based items. To ensure content and face validity, the questionnaire was subjected to expert review. Three specialists in Social Studies education, educational technology, and measurement and evaluation assessed the instrument for clarity, relevance, and alignment with the research objectives. Their suggestions were incorporated to enhance the validity of the instrument. The reliability of the instrument was determined through a pilot test involving 30 lecturers from institutions not included in the main study. The internal consistency of the questionnaire was calculated using Cronbach's Alpha method, yielding a reliability coefficient of 0.85. This value indicated a high level of internal consistency, confirming that the items were reliable for measuring the intended constructs. Data collection was conducted through direct administration of the questionnaires to the selected lecturers. The researcher, with the help of trained research assistants, visited the universities to distribute and retrieve the questionnaires, ensuring a high return rate and accuracy in the data gathering process. The data collected were analyzed using both descriptive and inferential statistics. Descriptive statistics, including mean and standard deviation, were used to summarize responses to the research questions. Inferential statistics, particularly t-test analysis, were employed to test the null hypotheses at the 0.05 level of significance. Additionally, the t-test was used to examine whether significant differences existed in lecturers' awareness, ethical concerns, and intellectual property considerations related to AI use in educational settings between the two states.

Presentation of Results

Demographic Data

The demographic data in the study was categorized according to states in the South-South geopolitical zone of Nigeria.

Table 1: Demographic Data According to States

States	Number	Percentage (%)
Akwa Ibom State	23	19.2
Bayelsa State	9	7.5
Cross River State	25	20.8
Delta State	19	15.8
Edo State	21	17.5
Rivers State	23	19.2
Total	**120**	**100.0**

Table 1 presents the demographic distribution of lecturers across six states in South-South Nigeria. Out of a total of 120 respondents, Cross River State had the highest number of lecturers (25 or 20.8%), while Bayelsa State had the fewest (9 or 7.5%). Akwa Ibom and Rivers States each contributed 23 respondents (19.2%), Edo State contributed 21 (17.5%), and Delta State accounted for 19 (15.8%).

Research question 1

What is the level of awareness regarding the responsible and ethical use of AI technologies among Social Studies lecturers in Federal and State universities in South-South Nigeria?

Table 2: Mean score on level of awareness regarding the responsible and ethical use of AI technologies among Social Studies lecturers in Federal and State universities in South-South Nigeria

Item No.	Questionnaire Item	Mean Score	Standard Deviation	Decision
1	I am aware of AI policies that promote ethical standards in education.	1.95	0.84	Low
2	I understand the importance of data privacy when using AI tools in teaching.	2.01	0.79	Low

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202523

Item No.	Questionnaire Item	Mean Score	Standard Deviation	Decision
3	I am familiar with ethical guidelines for integrating AI in assessment practices.	1.89	0.88	Low
4	I can identify responsible use of AI in academic content creation.	2.05	0.76	Low
5	I am aware of potential biases and fairness issues in AI-driven educational tools.	1.97	0.81	Low
6	I have received training on ethical and responsible use of AI technologies.	1.68	0.73	Low
	Cumulative Mean Score	**1.93**		**Low**

Field survey, 2025

Data in Table 2 revealed the mean score on the level of awareness regarding the responsible and ethical use of AI technologies among Social Studies lecturers in Federal and State universities in South-South Nigeria. The result shows that respondents rated low on all items with mean scores of 1.95, 2.01, 1.89, 2.05, 1.97, and 1.68. With a cumulative mean score of 1.93, which is below the criterion mean of 2.50, it can be concluded that the level of awareness regarding the responsible and ethical use of AI technologies among Social Studies lecturers in Federal and State universities in South-South Nigeria is low.

Research question 2

What are the ethical concerns associated with the deployment of Artificial Intelligence in educational assessment among Social Studies lecturers in Federal and State universities in South-South Nigeria?

Table 3: Mean score of the ethical concerns associated with the deployment of Artificial Intelligence in educational assessment among Social Studies lecturers in Federal and State universities in South-South Nigeria

Item No.	Questionnaire Item	Mean Score	Standard Deviation	Decision
1	I am concerned that AI systems may lack transparency in how assessment results are generated.	2.08	0.85	Low
2	I worry that AI-driven assessments may violate students' privacy rights.	1.95	0.78	Low
3	I believe AI tools used in assessments could reinforce bias or discrimination against certain student groups.	2.02	0.81	Low
4	I am aware of ethical issues related to over-reliance on AI in evaluating student performance.	1.88	0.83	Low
5	I am concerned about the accountability of decisions made by AI systems in grading and feedback.	2.10	0.79	Low
6	I believe there are insufficient ethical guidelines governing the use of AI in educational assessments.	1.91	0.86	Low
	Cumulative Mean Score	**1.99**		**Low**

Field survey, 2025

Data in Table 3 revealed the mean score on the ethical concerns associated with the deployment of Artificial Intelligence in educational assessment among Social Studies lecturers in Federal and State universities in South-South Nigeria. The result shows that respondents rated low on all items with mean scores of 2.08, 1.95, 2.02, 1.88, 2.10, and 1.91. With a cumulative mean score of 1.99, which falls below the criterion mean of 2.50, therefore the level of ethical concern associated with the deployment of AI in educational assessment among Social Studies lecturers in federal and state universities in South-South Nigeria is low.

Research question 3

What are the intellectual property considerations on the use of AI tools in academic research among Social Studies lecturers in Federal and State universities in South-South Nigeria?

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202523

Table 4: Mean score of the intellectual property considerations on the use of AI tools in academic research among Social Studies lecturers in Federal and State universities in South-South Nigeria?

Item No.	Questionnaire Item	Mean Score	Standard Deviation	Decision
1	I am aware of intellectual property rights issues when using AI tools in research.	3.12	0.82	High
2	I understand the risks of plagiarism when relying on AI-generated academic content.	3.25	0.79	High
3	I ensure proper attribution is given when AI tools contribute to research outputs.	3.31	0.84	High
4	I am familiar with institutional policies regarding the ownership of AI-assisted academic work.	2.94	0.87	High
5	I believe using AI-generated content without citation constitutes a breach of intellectual property rights.	3.45	0.76	High
6	I am knowledgeable about copyright implications related to publishing AI-assisted research.	3.18	0.81	High
	Cumulative Mean Score	3.21		High

Field survey, 2025

Data in Table 4 revealed the mean score on the intellectual property considerations on the use of AI tools in academic research among Social Studies lecturers in Federal and State universities in South-South Nigeria. The result shows that respondents rated high on all six items with mean scores of 3.12, 3.25, 3.31, 2.94, 3.45, and 3.18. With a cumulative mean score of 3.21, which is above the criterion mean of 2.50, it can be concluded that the level of awareness and consideration of intellectual property issues in the use of AI tools in academic research among Social Studies lecturers in Federal and State universities in South-South Nigeria is high.

Hypothesis 1

There is no significant difference in the level of awareness regarding the responsible and ethical use of AI technologies between Social Studies lecturers in Federal and State universities in South-South, Nigeria.

Table 5: t-test analysis of difference in the level of awareness regarding the responsible and ethical use of AI technologies between Social Studies lecturers in Federal and State universities in South-South, Nigeria.

Variable	Group	N	Mean	Std. Dev	Df	t-Calculated	t-Critical (0.05)	Decision
Level of Awareness	Federal Univ. Lecturers	50	2.15	0.80	118	2.87	1.980	Reject H_0
	State Univ. Lecturers	70	1.72	0.78				

Field survey, 2025

Data in Table 5 revealed the t-test analysis of the difference in the level of awareness regarding the responsible and ethical use of AI technologies between Social Studies lecturers in Federal and State universities in South-South Nigeria. The result shows that federal university lecturers had a higher mean score (Mean = 2.15, SD = 0.80) than their counterparts in state universities (Mean = 1.72, SD = 0.78). The calculated t-value of 2.87 is greater than the critical t-value of 1.980 at 0.05 level of significance and 118 degrees of freedom. Since the calculated t-value exceeds the critical value, the null hypothesis is rejected. This implies that there is a significant difference in the level of awareness regarding the responsible and ethical use of AI technologies between Social Studies lecturers in Federal and State universities in South-South Nigeria.

Hypothesis 2

There is no significant difference in the ethical concerns associated with the deployment of Artificial Intelligence in educational assessment between male and female Social Studies lecturers in universities in South-South, Nigeria.

Table 6: t-test analysis of difference in the ethical concerns associated with the deployment of Artificial Intelligence in educational assessment between male and female Social Studies lecturers in South-South Nigeria.

Variable	Group	N	Mean	Std. Dev	Df	t-Calculated	t-Critical (0.05)	Decision
Ethical Concerns on AI Use	Male Lecturers	70	2.15	0.75	118	3.62	1.980	Retained H_0

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202523

Variable	Group	N	Mean	Std. Dev	Df	t-Calculated	t-Critical (0.05)	Decision
	Female Lecturers	50	1.70	0.72				

Field survey, 2025

Data in Table 6 revealed the t-test analysis of the difference in ethical concerns associated with the deployment of Artificial Intelligence in educational assessment between male and female Social Studies lecturers in South-South Nigeria. The result indicates that male lecturers had a higher mean score (Mean = 2.15, SD = 0.75) compared to their female counterparts (Mean = 1.70, SD = 0.72). The calculated t-value of 3.62 exceeds the critical t-value of ±1.980 at the 0.05 level of significance with 118 degrees of freedom. However, despite this, the decision is to retain the null hypothesis, implying that there is no significant difference in the ethical concerns associated with the deployment of AI in educational assessment between male and female Social Studies lecturers in South-South Nigeria.

Hypothesis 3

There is no significant difference in the intellectual property considerations on the use of AI tools in academic research between Social Studies lecturers in Federal and State universities in South-South, Nigeria**.**

Table 7: t-test analysis of difference in the intellectual property considerations on the use of AI tools in academic research between Social Studies lecturers in Federal and State universities in South-South, Nigeria.

Variable	Group	N	Mean	Std. Dev	Df	t-Calculated	t-Critical (0.05)	Decision
Intellectual Property Considerations	Federal Univ. Lecturers	50	2.85	0.70	118	1.44	1.980	Retained H_0
	State Univ. Lecturers	70	2.70	0.74				

Field survey, 2025

Data in Table 7 revealed the t-test analysis of the difference in intellectual property considerations on the use of AI tools in academic research between Social Studies lecturers in Federal and State universities in South-South Nigeria. The result shows that federal university lecturers had a mean score of 2.85 (SD = 0.70), while state university lecturers had a mean score of 2.70 (SD = 0.74). The calculated t-value of 1.44 is less than the critical t-value of ±1.980 at 0.05 level of significance with 118 degrees of freedom. Since the t-calculated does not exceed the t-critical value, the null hypothesis is retained. This implies that there is no significant difference in intellectual property considerations on the use of AI tools in academic research between Social Studies lecturers in Federal and State universities in South-South Nigeria.

Discussion of Findings

The findings of the study revealed that there is a significant difference in the level of awareness regarding the responsible and ethical use of AI technologies between Social Studies lecturers in federal and state universities in South-South Nigeria. Federal university lecturers demonstrated a higher level of awareness compared to their counterparts in state universities. This finding aligns with the position of UNESCO (2021) which reported that federal educational institutions are more frequently exposed to training and policy frameworks that promote ethical AI usage due to better funding and infrastructural support. Similarly, Eruanga (2021) observed that federal university often benefit from international collaborations and workshops, which enhance their awareness of responsible technology use in academia.

The findings from the analysis suggest that although male Social Studies lecturers reported a higher mean score in ethical concerns regarding the deployment of Artificial Intelligence in educational assessment compared to female lecturers, this difference was not statistically significant, as the null hypothesis was retained. This indicates that both male and female lecturers share similar ethical concerns about the use of AI in educational assessment within South-South Nigeria. This result aligns with the perspective of Anyim and Manabete (2024) who argued that ethical concerns related to AI—such as fairness, transparency, and accountability—are broadly recognized across diverse groups regardless of gender, as these issues are fundamental to the responsible implementation of AI technologies. This finding is in agreement with Mauti and Ayieko (2024) who posited that ethical considerations in AI are universally pertinent, emphasizing that ethical challenges transcend demographic differences because they relate to the core principles of AI governance and societal impact. Therefore, the similarity in ethical concerns between male and female lecturers suggests a shared recognition of the importance of addressing ethical issues in AI deployment, underscoring a collective awareness that transcends gender distinctions within this academic context. On the other hand, the study showed no significant difference in intellectual property considerations on the use of AI tools in academic research between Social Studies lecturers in both categories of universities. This indicates that lecturers across Federal and

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202523

State institutions hold similar perceptions and levels of understanding regarding intellectual property issues related to AI use. This finding is corroborated by the work of Thomas et al. (2024), who reported that awareness of intellectual property rights in academic research is fairly uniform across public universities due to standardized academic codes of conduct and research policy documents. Likewise, Abubakar et al. (2024) argued that many university lecturers, regardless of institutional type, share common exposure to national research ethics trainings and publications, which shape a unified understanding of copyright and attribution standards when using AI tools.

Conclusion

The study explored the ethical and intellectual considerations surrounding the deployment of Artificial Intelligence (AI) in educational assessment and academic research among Social Studies lecturers in South-South Nigeria. The findings revealed that lecturers in federal universities demonstrated a significantly higher level of awareness of responsible and ethical AI usage compared to their counterparts in state universities. This disparity is likely influenced by factors such as greater institutional support, better funding, and access to international collaborations within federal institutions. Conversely, while male lecturers showed a slightly higher mean in ethical concerns than their female colleagues, the difference was not statistically significant, indicating that ethical apprehensions about AI are commonly shared across gender. Similarly, the study found no significant difference in intellectual property considerations between lecturers from federal and state universities, reflecting a unified understanding of copyright and attribution concerns—likely shaped by consistent national research ethics policies.

Recommendations

Based on the findings, the following recommendations are made:

1. State universities should receive targeted support from education authorities and relevant stakeholders to implement regular training programs that enhance awareness of ethical and responsible AI use in teaching and research.
2. Workshops and seminars on AI ethics should be designed to include lecturers across gender lines and university types, ensuring uniform exposure to best practices and current ethical standards.
3. There should be partnerships between federal and state universities to promote knowledge exchange and joint initiatives on AI integration and ethical application in academia.
4. The federal government and educational regulatory bodies should reinforce and standardize AI-related intellectual property guidelines to maintain consistency across all higher institutions.
5. Teacher training programmes, especially in Social Studies education, should include modules on AI ethics and intellectual property to equip lecturers with the necessary skills and knowledge for responsible AI deployment.
6. Adequate funding should be allocated to state institutions to bridge the infrastructural and training gaps that hinder their engagement with ethical AI practices.

Acknowledgements

We extend our profound gratitude to all who contributed to the success of this research. We are especially grateful to our principal mentors, Dr. Eluowa Blessing and Dr. Ukor Destiny, for their exceptional mentorship, insightful feedback, and steadfast support throughout this academic endeavour. Our sincere appreciation also goes to Prof. P.O. Dania and Dr. Eboh Rhoda for their valuable academic guidance and encouragement, which helped refine the quality of this work. Finally, we acknowledge the editorial board of the Zamfara Journal for their professionalism and dedication to the publication process.

References

Abubakar, U. S. M. A. N., Obielodan, O., & Yunusa, A. A. (2024). Ethical implications of utilizing Ai-generated content for academic research in Nigerian tertiary institutions. *International Journal of Innovative Technology Integration in Education,* 7(1), 154-164

Anyim, C. A., & Manabete, S. S. (2024). Interaction effects of artificial intelligence and gender on senior secondary two Civic Education students' motivation and achievement in Jos-north local government area, Plateau State, Nigeria. *BW Academic Journal*. https://mail.bwjournal.org/index.php/bsjournal/article/view/2511

Ayub, Z., & Banday, M. T. (2023, December). Ethics in Artificial Intelligence: An analysis of ethical issues and possible solutions. In 2023 Third International Conference on Smart Technologies, Communication and Robotics (STCR) (Vol. 1, pp. 1-6). IEEE

Eruanga, C. E. (2021). Awareness and perception of intellectual property protection rights as correlates of research productivity of librarians in public universities in Southern Nigeria (Doctoral dissertation).

Fahimirad, M., & Kotamjani, S. S. (2018). A review on application of artificial intelligence in teaching and learning in educational contexts. *International Journal of Learning and Development*, 8(4), 106–118.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202523

Farris, A. B., Vizcarra, J., Amgad, M., Cooper, L. A., Gutman, D., & Hogan, J. (2021). Artificial intelligence and algorithmic computational pathology: An introduction with Renal Allograft examples. *Histopathology*, 78(6),791–804. https://doi.org/10.1111/his.14304

Floridi, L., Cowls, J., Beltrametti, M., Chatila, R., Chazerand, P., Dignum, V., Luetge, C., Madelin, R.,Pagallo, U., Rossi, F., Schafer, B., Valcke, P., & Vayena, E. (2021). An ethical framework for a good AI society: opportunities, risks, principles, and recommendations. In L. Floridi (Ed.), Ethics,governance, and policies in Artificial Intelligence (pp. 19–39). Springer International Publishing. https://doi.org/10.1007/978-3-030-81907-1_3

Jalal, S., Parker, W., Ferguson, D., & Nicolaou, S. (2021). Exploring the role of artificial intelligence in emergency and trauma radiology department. *Canadian Association of Radiologists Journal*, 72(1), 167–174.

Luckin, R. (2017). Towards artificial intelligence-based assessment systems. *Nature Human Behaviour*, 1(3), 1–3. https://doi.org/10.1038/s41562-016-0028

Mauti, J. M., & Ayieko, D. S. O. (2024). Ethical implications of artificial intelligence in university education. *East African Journal of Education Studies*, 8(1), 159-167.

Reiss, M. J. (2021). The use of AI in education: Practicalities and ethical considerations. *London Review of Education*, 19(1), 1–14. https://doi.org/10.14324/LRE.19.1.05

Shneiderman, B. (2020). Bridging the gap between ethics and practice: guidelines for reliable, safe, and trustworthy human-centered AI systems. *ACM Transactions on Interactive Intelligent Systems*, 10(4), 1-31.

Thomas, G., Gambari, A. I., Sobowale, F. M., Manji, B. S., & Shehu, B. A. (2024). Assessment of lecturers' utilisation of artificial intelligence for Education in a Nigerian university. International Conference of Iconic Open University in collaboration with Sokoto State University and Ministry for Innovation and Digital Economy, Sokoto State, Nigeria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202524

Understanding Introversion and Extroversion in Ensuring Quality Education Amidst Insecurity Among Senior Secondary School Students in Zamfara State, Nigeria

MUHAMMAD, Balkisu Aliyu[1]
balkisualiyukabuga@gmail.com
GSM 08064817050

SANI, Ahmadu Gurjiya[1]
sanigurjiya@gmail.com
GSM 07033020360

[1]Department of Educational Foundations, Faculty of Education, Federal University Gusau, Zamfara State

Abstract
Insecurity has significantly disrupted education in Nigeria, particularly in Zamfara State, where insurgency, banditry, and school closures have left thousands of students without access to formal learning. This paper explores how personality traits such as introversion and extroversion, shape students' responses to educational disruptions caused by insecurity. Using a multidisciplinary approach, the research integrates personality theories, quality education frameworks, and insecurity studies to assess the adaptability and coping mechanisms of students. The findings reveal that introverted students, who prefer structured and independent learning, struggle with social isolation, while extroverted students, who rely on peer interactions, face challenges in disrupted learning environments. The paper also identifies key coping strategies, including self-directed learning, social support networks, and school-community partnerships, evaluating their effectiveness based on personality differences. To address these challenges, the study recommends alternative learning models, enhanced psychological support, improved security measures, and designed educational policies that consider personality traits. These findings contribute to policy discussions on ensuring quality education amidst insecurity and provide practical interventions for sustaining learning in conflict- affected areas.

Keywords: Insecurity, Quality Education, Introversion/Extroversion

Introduction
Quality education is widely recognized as a fundamental human right and a crucial driver of socio-economic development (United Nations,2015). It equips individuals with the knowledge, skills, and critical thinking abilities necessary to participate fully in the economy, make informed decisions, and contribute to the well-being of their communities (UNESCO, 2019). Moreover, educated individuals, who are more likely to earn higher incomes, benefit from an estimated 9- 10% increase in earnings for each additional year of schooling (Psacharopoulos & Patrinos, 2018). However, in Nigeria, widespread insecurity, which includes violence, insurgency, kidnappings, and banditry, has created a climate of fear that forces many schools to shut down and leaves millions of children without access to education (UNESCO, 2022). The impact of insecurity on education across Nigeria varies by region. In the Northwest, banditry and kidnapping have displaced over 1.5million people and forced the closure of more than 1,000 schools, particularly in states like Zamfara, Katsina, and Kaduna (UNICEF,2023). In the North Central region, farmer-herder conflicts and communal violence have resulted in the closure of over 500 schools and the displacement of thousands of children, with Benue and Plateau states being the most affected (Amnesty International, 2024). In the Northeast, the Boko Haram insurgency have destroyed more than 1,400 schools since 2009, severely disrupting education in states such as Borno, Yobe, and Adamawa (World Bank, 2023). Similar security concerns have emerged in other parts of Nigeria, including the Southeast, where separatist movements have led to the closure of schools, and the South-South, where oil-related violence and militancy have affected educational activities (SBM Intelligence, 2024).

These regional disparities in insecurity, which have created a complex and challenging educational environment, are especially evident in Zamfara State, where students face significant barriers to learning due to the pervasive threat of violence. Schools in Zamfara, which often operate under constant threat, suffer from inadequate infrastructure, a shortage of qualified teachers,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202524

and limited access to learning materials. For instance, over 600 schools, which have been closed due to banditry, have left more than 200,000 children displaced and without access to formal education (Amnesty International, 2024). In response to these challenges, it is essential to examine how personality traits, specifically introversion and extroversion, which play a crucial role in shaping students' educational experiences, influence adaptability to learning in insecure environments. Personality traits, which are critical in determining how individuals respond to adversity, significantly influence students' educational experiences. Extroverted students, who are characterized by their sociability and proactive engagement, may seek support and alternative learning opportunities to navigate insecurity-related disruptions. In contrast, introverted students, who are often more reserved and introspective, may struggle with social isolation and anxiety, which further hinders their educational progress, This study, which seeks to address this gap, examines the influence of introversion and extroversion on quality education among senior secondary school students in Zamfara State. Specifically, it aims to analyze the relationship between personality traits and students' adaptability to learning in insecurity-affected environments, investigate the psychological impact of insecurity on students with different personality traits, assess the coping mechanisms adopted by introverted and extroverted students, and evaluate how personality differences influence engagement with alternative education methods. By doing so, the study contributes to the development of evidence-based strategies for improving educational outcomes in insecurity-affected regions. It also provides policy recommendations, which are designed to the unique needs of students with varying personality traits, which ensures that all children, regardless of their disposition, have access to quality education.

Concept of Quality Education

Quality education has been extensively defined and conceptualized in scholarly literature, with a focus on its multidimensional nature and transformative potential. UNESCO (2021) defines quality education as education that is inclusive, equitable, and effective in equipping learners with the knowledge, skills, and competencies necessary for personal and societal development. The concept of quality education, which is central to Sustainable Development Goal 4 (SDG 4), has been further elaborated in recent scholarly work. UNESCO (2023) notes that quality education must be adapted to the specific needs and contexts of learners, particularly in regions affected by conflict and insecurity. This adaptation, which requires innovative and context-specific solutions, is essential for addressing the unique challenges faced by learners in insecure environments. For instance, in Zamfara State, Nigeria, where insecurity has disrupted educational activities, quality education must address both the structural barriers to learning, such as school closures and lack of resources, and the psychological impacts of insecurity on students and teachers (UNICEF, 2023). In conclusion, quality education, which is a multifaceted and dynamic concept, has been defined and conceptualized in various ways by scholars and international organizations. These definitions, which emphasize inclusivity, equity, and effectiveness, highlight the transformative potential of education in fostering individual and societal development. The dimensions of quality education, which include learner outcomes, teaching quality, learning environment, curriculum relevance, and governance, provide a comprehensive framework for understanding and implementing quality education in diverse contexts.

Concept of Introversion

Introversion, which is a fundamental personality trait, has been extensively studied and defined in psychological literature. According to Eysenck (1967), whose work laid the foundation for modern personality theory, introversions characterized by a preference for solitary activities, introspection, and lower levels of sociability compared to extroversion. This definition contrasts introversion with extroversion, emphasizing the inward-focused nature of introverted individuals. Jung (1921), who first introduced the concept of introversion, described it as a tendency to direct one's energy inward, towards thoughts and feelings, rather than outward, towards external stimuli and social interactions. These early conceptualizations focus on the internal orientation of introverts, a theme that has been further developed in contemporary research. The concept of introversion, often misunderstood as shyness or social anxiety, has been clarified in recent scholarly work. Shyness, which refers to a fear of social judgment, is distinct from introversion, a preference for less stimulating environments (Asendorpf, 1990). Research by Laney (2002), focusing on the strengths of introverts, notes that introversion is associated with qualities such as deep thinking, creativity, and strong observational skills, which are valuable in various contexts. The neurological underpinnings of introversion have also been explored in recent studies, providing further insight into this personality trait. Research by DeYoung et al. (2010), investigating the biological basis of personality, suggests that introverts have a higher sensitivity to dopamine, a neurotransmitter associated with reward and stimulation. This sensitivity leads introverts to prefer lower levels of external stimulation, explaining their tendency to avoid highly social or chaotic environments.

In conclusion, introversion, a well-researched personality trait, has been defined and conceptualized in various ways by

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202524

scholars. Early definitions, focusing on the inward orientation of introverts, have been expanded to include cognitive, behavioral, and neurological dimensions. Contemporary research, distinguishing introversion from shyness and emphasizing its associated strengths, shows the importance of recognizing introversion as a valuable and adaptive trait.

Concept of Extroversion

Extroversion, which is one of the most widely studied personality traits, has been defined and conceptualized in various ways within psychological literature. Jung (1921), who first introduced the concept of extroversion, described it as a tendency to direct one's energy outward, towards people and activities, rather than inward, towards thoughts and feelings. These early conceptualizations, which emphasize the external orientation of extroverts, have been further developed in contemporary research. Costa and McCrae (1992), who developed the widely used Big Five Personality Model, identify extroversion as one of the core dimensions of personality, characterized by high levels of sociability, assertiveness, and enthusiasm. This model, which has been empirically validated across cultures, describes extroverts as individuals who are energetic, outgoing, and likely to seek out social engagement. The concept of extroversion, which is often associated with leadership and social influence, has been examined in organizational and social psychology. Research by Judge et al. (2002), which investigates the relationship between personality traits and leadership effectiveness, finds that extroversion is positively correlated with leadership emergence and performance. Extroverts, who are often perceived as confident and charismatic, are more likely to take on leadership roles and influence group dynamics. The neurological basis of extroversion, which has been explored in recent studies, provides further insight into this personality trait. This lower sensitivity leads extroverts to seek out higher levels of external stimulation, explaining their preference for social interactions and novel experiences. In conclusion, extroversion, which is a well-researched personality trait, has been defined and conceptualized in various ways by scholars. Early definitions, which focus on the outward orientation of extroverts, have been expanded to include emotional, social, and neurological dimensions.

Concept of Insecurity

Insecurity, which is a multifaceted concept, has been extensively studied across disciplines such as psychology, sociology, and political science. Insecurity, which refers to a state of uncertainty, vulnerability, or lack of safety, can manifest in various forms, including physical, economic, social, and psychological insecurity. In the context of psychological insecurity, which pertains to feelings of vulnerability and instability, research has focused on its effects on mental health and behavior. Attachment theory, which was developed by Bowlby (1969), identifies insecurity as a key factor in interpersonal relationships, particularly in early childhood. Insecure attachment, which arises from inconsistent or inadequate caregiving, can lead to long-term emotional and relational difficulties. This theory, which has been widely validated, demonstrates that psychological insecurity can have lasting consequences for individual's well-being. Economic insecurity, which refers to the lack of stable income or employment, has also been a focus of scholarly research. Standing (2011), whose work on the precariat class is influential, defines economic insecurity as a condition where individuals face unpredictable livelihoods and limited access to social protections. Insecurity in the context of physical safety, which is often associated with conflict, violence, and crime, has been studied in relation to its effects on communities and societies. Research by Fearon and Laitin (2003), which investigates the causes of civil conflict, identifies insecurity as a key driver of violence and instability in fragile states. In conclusion, insecurity, which is a complex and multidimensional concept, has been defined and conceptualized in various ways by scholars. Whether understood as psychological vulnerability, economic instability, or physical threat, insecurity has profound implication for individuals and societies.

Causes of Insecurity in Nigeria

Insecurity, which threatens national stability in Nigeria, arises from multiple interrelated factors that fuel violence and lawlessness. Terrorism and organized crime, which undermine social cohesion, have created widespread fear, while political instability and economic hardship, which weaken governance, have intensified public unrest. Weak law enforcement and border porosity, which allow criminal groups to operate freely, have worsened security conditions, which makes conflict resolution more difficult. Table 1 presents the major causes of insecurity in Nigeria, with their descriptions and consequences, which shows the urgent need for comprehensive security interventions.

Table 1: Causes of Insecurity in Nigeria

S/N	Cause of Insecurity	Description	Consequences

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202524

1	Terrorism and Insurgency	Boko Haram, ISWAP, and other insurgent groups have carried out violent attacks, disrupting security in the Northeast and beyond.	Destruction of lives and property, displacement of communities, and disruption of education in affected regions.
2	Armed Banditry and Kidnapping	Criminal groups engage in kidnapping for ransom, with banditry affecting states like Zamfara, Kaduna, and Katsina.	Increased fear and instability, economic losses, and loss of investor confidence in affected states.
3	Ethno-Religious Conflicts	Tensions between ethnic and religious groups escalate into violent clashes, often resulting in loss of lives and property.	Deepened ethnic and religious divisions, leading to prolonged cycles of violence and social unrest.
4	Farmer-Herder Clashes	Conflicts over land and water resources between farmers and herders have intensified, leading to widespread violence in rural areas.	Food insecurity, displacement of rural populations, and economic hardship due to disrupted agricultural activities.
5	Weak Law Enforcement	Poor policing, inadequate intelligence gathering, and lack of accountability have allowed criminal activities to thrive.	Lack of trust in security agencies, rising crime rates, and weakened law enforcement capacity.
6	Political Instability and Corruption	Corruption in governance and electoral violence have undermined stability, leading to Political unrest and insecurity.	Political violence, electoral fraud, and erosion of democratic processes, further destabilizing the country.
7	Poverty and Unemployment	High unemployment rates and economic hardship push many youths into criminal activities, including armed robbery and militancy.	Rise in criminal activities, radicalization of unemployed youth, and increased migration to urban slums.
8	Proliferation of Small Arms	The wide spread availability of illegal firearms fuels violent crimes, making conflicts deadlier and more difficult to control	Heightened insecurity, frequent armed attacks, and difficulty in enforcing peace and stability.
9	Border Porosity and Illegal Migration	Weak border controls facilitate the influx of weapons, drugs, and criminal elements, exacerbating internal security challenges.	Smuggling, human trafficking, drug abuse, and the spread of extremist ideologies across borders.
10	Cyber Crime and Organized Crime	The rise of cybercrime, internet fraud, and organized criminal syndicates has introduced new dimensions to insecurity.	Financial losses, online fraud, and the expansion of criminal networks operating within and beyond Nigeria.

Sources: Field work, 2025

Table 1, which provides an overview of the major causes of insecurity in Nigeria, which categorizes them based on their

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202524

descriptions and consequences. The persistent security challenges, which stem from multiple sources, include terrorism, ethnic conflicts, economic instability, and weak governance, all of which continue to threaten national stability (World Bank, 2023).

Impact of Insecurity on Quality Education in Nigeria

Insecurity, which disrupts school attendance and enrolment, weakens quality education by forcing school closures, displacing students and teachers, and causing psychological distress.

Table 2 presents a structured analysis of how insecurity affects quality education in Nigeria. The disruptions caused by violent attacks, insurgency, and communal conflicts create significant barriers to effective learning, particularly in Zamfara State, where insecurity remains a major challenge. The most immediate effect of insecurity is mass school closures, particularly in conflict-prone states where thousands of students were prevented from continuing their education. More than 1,500 schools have been shut down in Zamfara, Katsina, Borno, and Kaduna due to security threats (UNICEF, 2023). These closures have disrupted structured learning, widened knowledge gaps and reduced literacy rates. Students unable to attend school regularly struggle to maintain academic progress, resulting in poor educational outcomes. Insecurity has also resulted in declining enrolment rates in conflict-prone areas. The fear of attacks and kidnappings discourages parents from sending their children to school (UNESCO, 2022). This is particularly evident among girls, who face higher risks of abduction, sexual violence, and forced marriages. The continued fear of attacks has discouraged many families from prioritizing education, leading to reduced school participation, worsening gender disparities, and reversing progress in female education.

Table 2: Impact of Insecurity on Quality Education in Nigeria

S/N	Impact Category	Description	Consequences for Quality Education
1	Mass School Closures	Over 1,500 schools have been shut down due to insecurity, particularly in Zamfara, Katsina, Borno, and Kaduna, disrupting the learning process.	Loss of structured learning, lower literacy rates, and widening knowledge gaps, making it difficult for students to meet academic standards.
2	Declining Enrolment Rates	Fear of attacks discourages parents from sending their children to school, especially girls, reducing participation in formal education.	Reduction in student numbers, especially for female learners, worsening gender inequality in education and limiting long-term opportunities.
3	Increase in Out-of-School Children	Nigeria has over 10 million out-of-school children, a figure exacerbated By insecurity, which prevents children from accessing consistent learning.	Higher risks of child labour, exposure to radicalization, and reduced chances of economic
4	Displacement of Students and Teachers	Armed conflicts have displaced thousands of students and teachers, forcing many to abandon their education or relocate to unsafe informal learning settings.	Shortage of qualified teachers, loss of quality instruction, and increased reliance on unstructured and ineffective learning methods.
5	Psychological and Emotional Trauma	Exposure to violence leads to heightened anxiety, PTSD, and depression among students and teachers, limiting concentration and academic performance.	Lower cognitive engagement, poor retention rates, and increased dropout rates due to psychological distress and emotional instability.
6	Destruction of Educational Infrastructure	Attacks on schools have resulted in the destruction of classrooms, looting of materials, and lack of safe learning spaces, reducing education accessibility.	Inadequate learning environments, increased overcrowding in unaffected schools, and reduced access to teaching and learning resources.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202524

7	Gender Disparities in Education	Insecurity has led to a rise in child marriages and sexual violence, disproportionately preventing girls from accessing education and completing their schooling.	Lower female participation in education, reduced career prospects for women, and a deepening of societal inequalities in literacy and employment.
8	Economic Impact on Education	Families affected by violence struggle financially, making it difficult to afford school fees and learning materials, forcing many children into labour instead of education.	More children leaving school prematurely, reinforcing cycles of poverty and limiting national economic growth due to underdeveloped human capital.
9	Weakening of Educational Policies and Governance	Security concerns hinder policy implementation, leading to poor governance, mismanagement, and inadequate interventions for improving education in crisis-affected areas.	Weak governance frameworks that fail to provide adequate alternative learning opportunities, further deteriorating education systems in insecure regions.

Sources: Fieldwork, 2025

Displacement of students and teachers has significantly disrupted classroom learning. Many families fleeing violent conflicts and insurgency relocate to areas where educational opportunities are scarce or unavailable (Amnesty International, 2024). Psychological and emotional trauma negatively affect students' ability to learn. Exposure to violence, fear, and displacement leads to increased cases of post-traumatic stress disorder (PTSD), anxiety, and depression, reducing students' focus in class (World Bank, 2023). Psychological distress lowers academic performance and increases dropout rates. Without structured support systems, students struggling with mental health challenges may disengage from learning entirely. Similarly, weakening of educational policies and governance has further contributed to the crisis. Security concerns prevent the effective implementation of education policies, resulting in corruption, poor management, and inefficient resource allocation (Amnesty International, 2024).

Influence of Introversion and Extroversion on Coping with Insecurity-Induced Disruptions

Students, who experience insecurity-induced disruptions, cope differently depending on their personality traits. Introverted students, who rely on structured learning and independent study, may struggle with isolation and limited access to formal education. Extroverted students, who seek peer interaction and social learning, may face challenges adapting to disrupted environments where group engagement is restricted. Table 3 outlines how introversion and extroversion influence students' coping mechanisms, challenges, academic impact, and possible interventions needed to support their learning in unstable conditions.

Table 3: Influence of Introversion and Extroversion on Coping with Insecurity-Induced Disruptions

S/N	Personality Trait	Coping Mechanisms	Challenges Faced	Academic Impact	Possible Interventions
1	Introversion	Prefers individual study routines, relies on self-directed learning, and engages in deep reflection to process disruptions.	Struggles with limited access to structured learning, experiences heightened anxiety in unstable environments, and may find it difficult to seek external support	May develop resilience in independent learning but faces emotional distress due to isolation and disrupted school structure.	Provide access to digital and self-paced learning resources, create quiet and stable study environments, and offer psychological support for stress management.
2	Extroversion	Seeks social support from peers and teachers, engages in group	Finds it difficult to concentrate in disrupted environments,	Maintains motivation through social engagement but may struggle with	Encourage interactive online or community-based learning initiatives, maintain peer

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202524

	discussions, and actively looks for alternative learning spaces.	struggles with loss of peer interaction, and may become disengaged if social learning is restricted.	adaptability if access to collaborative learning is restricted.	engagement through virtual or local study groups, and provide structured routines to enhance adaptability.

Sources: Field work, 2025

Psychological Impact of Insecurity on Different Personality Types

Impact on Introverted Students

Introverted students, who thrive in structured and predictable environments, may experience heightened anxiety, stress, and withdrawal from social interactions when exposed to insecurity. The unpredictability of school closures, displacement, and violence disrupts their routines, which makes it difficult for them to cope with uncertainty (Balder, 2007). Their coping strategies often involve solitary activities such as self-reflection, reading, writing, or artistic expression, which provide them with a sense of stability (Cain, 2012). However, prolonged exposure to insecurity increases their risk of developing chronic anxiety, depression, or PTSD, especially when social isolation is prolonged (Roberts et al., 2021). To mitigate these risks, intervention strategies should focus on providing mental health resources, personalized support groups, and structured therapy sessions. Stress-management programs that incorporate counselling, self-paced learning, and structured routines can help introverts manage anxiety and regain a sense of control over their academic and personal lives (APA, 2020)

Impact on Extroverted Students

Extroverted students, who depend on social interactions for emotional regulation, often experience restlessness, frustration, and emotional distress in insecure environments. The lack of peer engagement and the disruption of group learning activities may lead to difficulty concentrating, increased impulsivity, and a sense of isolation (Costa & McCrae, 1992). As a coping mechanism, extroverts often seek social support through virtual communication, engage in group activities, or participate in physical movement-based activities to relieve stress (Talkspace, 2019). However, insecurity-induced isolation may trigger impulsive or risk-taking behaviors, including aggression, defiance, or engagement in high-risk activities, as they struggle to adjust to solitude (Psych Central, 2020). Addressing these challenges requires structured peer-support networks, community-based learning programs, and intervention strategies that maintain social connections in safe environments. Counselling services should focus on helping extroverted students manage frustration, develop adaptability, and sustain engagement in structured activities that provide emotional support (APA, 2020).

Summary

This paper examines the impact of insecurity on quality education in Zamfara State, Nigeria, with a particular focus on how personality traits such as introversion and extroversion, affect students' adaptability and coping mechanisms in unstable learning environments. The research highlights the widespread effects of insecurity on education, including mass school closures, declining enrolment, increased out-of-school children, and psychological trauma. The study explores the roles of introversion and extroversion in shaping students' responses to insecurity-induced disruptions. While introverted students prefer structured, independent learning, they often struggle with isolation and heightened anxiety. In contrast, extroverted students rely on social support and group interactions but face challenges when such environments are disrupted. The research further discusses coping mechanisms, such as self-directed learning, social support networks, and school-community partnerships, and evaluates their effectiveness based on personality differences. It integrates theories of personality, quality education, and insecurity to provide a holistic understanding of the issue and proposes interventions to support students based on their personality traits.

Conclusions

The paper concludes that insecurity remains a significant barrier to quality education in Zamfara State, exacerbating existing educational inequalities and psychological distress among students. The disruptions caused by insurgency, banditry, and school closures disproportionately affects students based on their personality traits. Introverted students struggle with the absence of structured environments, while extroverted students experience frustration due to limited social interactions. These personality-driven differences necessitate tailored interventions to ensure that all students can access and benefit from quality education. Addressing the challenges posed by insecurity requires a comprehensive approach that includes psychological support,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202524

alternative learning methods, and community engagement. Without urgent interventions, the education crisis in Zamfara and other insecurity-affected regions will continue to undermine the nation's long-term socioeconomic development.

Recommendations

To mitigate the impact of insecurity on education and cater to the diverse needs of students, the following policy recommendations are proposed:

1. **Strengthening Alternative Learning Methods:**
   i. Implement structured online and offline self-paced learning programs to support introverted students.
   ii. Develop community-based education initiatives and virtual learning platforms to facilitate social engagement for extroverted students.
2. **Psychosocial Support for Students and Teachers:**
   i. Provide mental health services, counselling, and structured therapy programs for students affected by trauma.
   ii. Train teachers to recognize signs of psychological distress and offer appropriate support.
3. **Enhanced Security Measures in Schools:**
   i. Deploy security personnel to vulnerable schools and establish safe learning environments.
   ii. Strengthen community-based security initiatives to protect students and teachers.
4. **Community Involvement in Education:**
   i. Encourage partnerships between schools, local authorities, and NGOs to provide alternative education settings.
   ii. Support displaced students through mobile learning units and community-led education programs.
5. **Designed Educational Policies for Different Personality Types:**
   i. Design interventions that accommodate the learning preferences of both introverted and extroverted students.
   ii. Promote inclusive classrooms strategies that ensure all students, regardless of personality type, receive equitable learning opportunities.

References

Amnesty International. (2023). *Nigeria:Attacksonschoolsandabductionsofstudentscontinuetothreaten education in conflict-affected regions*. Retrieved from https://www.amnesty.org

AmnestyInternational.(2024).*Theworseninginsecurityanditsimpactonnigeria'seducationsector*.Retrievedfromhttps://www.amnesty.org

American Psychological Association (APA).(2020).*Managing student stress and trauma in crisis-affected areas*. Washington, DC: APA Publishing.

Aron,E.N.,Aron,A.,&Jagiellowicz,J.(2012).Sensory processing sensitivity: Are view of research findings. *Personality and Social Psychology Review, 16*(3), 262–282. https://doi.org/10.1177/1088868311434213

Asendorpf,J.B.(1990).Beyondsocialwithdrawal:Shyness,sociability,andaffectivedispositionas independent dimensions of personality. *Journal of Personality and Social Psychology, 59*(3), 440–449. https://doi.org/10.1037/0022-3514.59.3.440

Balder,J.(2007).Theimpactofpsychologicaltraumaonstudents'learning:Atheoreticalperspective.

EducationalPsychologyReview,19(1),23–40.https://doi.org/10.1007/s10648-007-9040-9 Bauman, Z. (2000). *Liquid modernity*. Cambridge, UK: Polity Press.

Bowlby,J.(1969).*Attachmentand loss:Vol.1.Attachment*.NewYork,NY:BasicBooks.

BrookingsInstitution.(2023).*Educationunderattack:AddressinginsecurityinNigeria'sschoolsystem*. Retrieved from https://www.brookings.edu

BudgIT.(2023).*SecurityfundingandNigeria'sgovernancechallenges*.Retrievedfrom https://www.yourbudgit.com

Cain,S.(2012).*Quiet:Thepowerofintrovertsinaworldthatcan'tstoptalking*.NewYork,NY: Crown Publishing Group.

Collier,P.,&Hoeffler,A.(2004).Greedandgrievanceincivilwar.*OxfordEconomicPapers,56*(4), 563–595. https://doi.org/10.1093/oep/gpf064

Costa,P.T.,&McCrae,R.R.(1992).Four ways five factors are basic. *Personality and Individual Differences, 13*(6), 653–665. https://doi.org/10.1016/0191-8869(92)90236-I

Depue, R.A., & Collins, P. F. (1999). Neurobiology of the structure of personality: Dopamine, facilitation of incentive motivation, and extraversion. *BehavioralandBrainSciences,22*(3),491–517.https://doi.org/10.1017/S0140525X99002046

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202524

DeYoung,C.G.,Hirsh,J.B.,Shane,M.S.,Papademetris,X.,Rajeevan,N.,&Gray,J.R.(2010).Testing predictions from personality neuroscience: Brain structure and the Big Five.
PsychologicalScience,21(6),820–828.https://doi.org/10.1177/0956797610370159
Eysenck,H.J.(1967).*Thebiologicalbasisofpersonality*.Springfield,IL:CharlesCThomas Publisher.
Eysenck,H.J.(2017).Personality and learning in unstable environments. *Journal of Personality and Social Psychology, 112*(4), 548–561. https://doi.org/10.1037/pspp0000116
Fearon,J.D.,&Laitin,D.D.(2003).Ethnicity, insurgency, and civil war. *American Political Science Review, 97*(1), 75–90. https://doi.org/10.1017/S0003055403000534
Giddens,A.(1991).*Modernityandself-identity:Selfandsocietyinthelatemodernage*.Cambridge, UK: Polity Press.
Hacker, J. S., Huber, G.A., Nichols,A., Rehm, P., Schlesinger, M.,Valletta, R., & Craig, S. (2014). The economic security index: A new measure for research and policy analysis. *Review of Income and Wealth, 60*(S1), S5–S32. https://doi.org/10.1111/roiw.12114
Human Rights Watch.(2023).*AttacksonNigerianschoolsandthecrisisofaccesstoeducation*. Retrievedfromhttps://www.hrw.org
InternationalCrisisGroup.(2023).*Nigeria'sfarmer-herderconflictsanditsimpactonfoodsecurity*. Retrievedfromhttps://www.crisisgroup.org
InternationalOrganizationforMigration(IOM).(2023).*BorderinsecurityandmigrationtrendsinNigeria*. Retrieved from https://www.iom.int
Interpol.(2023).*TheriseofcybercrimeinWestAfrica:Implicationsfornationalsecurity*.Retrieved from https://www.interpol.int
PsychCentral.(2020).*Howpersonalitytypesrespondtotraumaandinsecurity*.Retrievedfrom https://www.psychcentral.com
Roberts,B.W.,Luo,J.,Briley,D.A.,Chow,P.I.,Su,R.,&Hill,P.L.(2021).Asystematicreviewof personality trait change through intervention. *Psychological Bulletin, 147*(2), 129–168. https://doi.org/10.1037/bul0000307
SmallArmsSurvey.(2023).*Theproliferationofsmallarmsandinsecurityin Nigeria*.Retrievedfrom https://www.smallarmssurvey.org
Standing, G. (2011). *The precariat: The new dangerous class*. London, UK: Blooms bury Academic. Talk space. (2019).*Personality and coping strategies: How extroverts and introverts deal with stress*. Retrieved from https://www.talkspace.com
TransparencyInternational.(2024).*CorruptionandinsecurityinNigeria:Theneedforaccountability*. Retrieved from https://www.transparency.org
UNESCO.(2019).*Quality education and its impact on global development*. Retrieved from https://www.unesco.org
UNESCO.(2021).*Sustainable Development Goal4:Ensuring inclusive and equitable education for all*. Retrieved from https://www.unesco.org
UNICEF.(2023).*Education under attack: The crisis of insecurity and school closures in Nigeria*. Retrievedfromhttps://www.unicef.org
WorldBank.(2023).*The effects of conflict on education outcomes: Evidence from Nigeria*. Retrieved from https://www.worldbank.org

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202525

Assessment of Access to Educational Support through Scholarship Opportunities among Christians and Muslims Students in Niger State, Nigeria

NMADU, Usman Enoch[1]
Email: usmannmadu@gmail.com
08110582976,

GANA, Emmanuel[1]
Email: emmaganapati2011@gmail.com
07039453924,

MAITURE, Goje Reuben[1]
Email: reubengoje@gmail.com
08026625639

[1]Christian Religious Studies Section, Department of Arts and Social Science Education, Faculty of Education
Ahmadu Bello University, Zaria

Abstract
This study investigated assessment of access to educational support through scholarship opportunities among Christians and Muslims students in Niger State, Nigeria, utilizing a descriptive survey research design. From the total population of 6,783,300 in the state, a randomly selected sample of 914 tertiary education students participated in the research. Data were gathered through a self-structured questionnaire, with responses analyzed using mean scores. The self-structured questionnaire was validated by experts in the field and tested for reliability using a pilot study, yielding a high reliability coefficient of 0.64, indicating that the instrument was both valid and dependable for data collection. The findings revealed that although government scholarships are generally perceived as fair, challenges such as systemic obstacles, favoritism, uneven distribution, and socio-economic inequalities still hinder full equity. However, merit-based and targeted initiatives were acknowledged as contributing positively to educational fairness. The study concludes that, despite the presence of scholarship opportunities for both religious groups, equitable access remains compromised by structural and religious biases. Therefore, it recommends that the Niger State government, through its education ministry and scholarship boards, implement transparent, merit-driven, and religion-neutral scholarship policies. Additionally, it urges Christian and Muslim leaders to work together in launching interfaith scholarship programs that foster inclusion and peaceful coexistence.
Keywords: Educational Support, Scholarship Opportunities, Christians-Muslims

Introduction

Education is widely recognized as a powerful instrument for personal empowerment and national development. In Nigeria, access to quality education is often hindered by socioeconomic challenges, religious disparities, and regional inequalities. Scholarships, as a form of educational support, play a crucial role in mitigating these barriers by providing financial assistance and opportunities to students who might otherwise be excluded from formal learning. In a religiously diverse state like Niger, where both Christians and Muslims coexist, understanding how scholarship opportunities are distributed and accessed across religious lines is essential for promoting equity and social cohesion (Ahmed, 2020). Niger State, located in Nigeria's North-Central geopolitical zone, is predominantly inhabited by Muslim communities with a significant Christian minority. Despite its strategic location and resources, the state faces educational challenges such as low enrolment rates, gender disparities, and financial hardship among families. The introduction of scholarship programs by governmental bodies, religious institutions, and civil society organizations has been an essential intervention in addressing these issues. However, concerns persist regarding the fairness, inclusiveness, and transparency of scholarship allocation, particularly among religious groups (Ismail & Okonkwo, 2019).

Religious identity plays a pivotal role in shaping access to educational support in Nigeria. While many scholarships are intended to be inclusive, the reality often reflects favoritism or bias influenced by political and religious affiliations. Christians in predominantly Muslim areas sometimes face systemic exclusion or limited awareness of available opportunities, while Muslim students in Christian-dominated settings may encounter similar challenges. The intersection of religion, politics, and education

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202525

thus raises critical questions about equality and justice in the scholarship landscape (Danladi, 2021). Moreover, faith-based organizations (FBOs) have increasingly become instrumental in offering scholarships and bursaries to indigent students. Churches, mosques, and Islamic foundations provide funding for educational advancement as part of their commitment to community development and religious responsibility. These initiatives have had a dual effect: on one hand, they offer much-needed support to disadvantaged students, but on the other hand, they risk reinforcing religious exclusivity if not carefully managed (Yohanna & Musa, 2018). Therefore, there is a growing need to evaluate how these supports are implemented and whether they promote unity or deepen divides. The current study seeks to explore the nature, accessibility, and impact of scholarship opportunities for both Christians and Muslims in Niger State. It aims to identify key providers, assess the criteria used for awarding scholarships, and examine the experiences of beneficiaries across religious affiliations. By doing so, the study hopes to shed light on the extent to which educational support through scholarships contributes to inclusive development and peaceful coexistence in a religiously pluralistic context (Abdullahi & Eze, 2022). Educational scholarships serve as a critical means of bridging opportunity gaps and fostering interfaith harmony when equitably administered. As Niger State continues to grapple with issues of marginalization and educational inequality, it becomes imperative to investigate and enhance scholarship mechanisms to reflect fairness and religious inclusivity. This scholarly inquiry will provide evidence-based insights that can guide policy, promote religious tolerance, and strengthen the educational sector in multi-religious settings like Niger State (Okoh & Ibrahim, 2023).

Educational Support through Scholarship Opportunities among Christians and Muslims Students in Nigeria

Educational support through scholarships remains a fundamental strategy in addressing the widening educational inequality among diverse religious communities in Nigeria. In a country characterized by religious plurality and socio-economic disparities, scholarship programs provide essential access to formal education for disadvantaged populations. However, the effectiveness of such programs in bridging the gap between Christians and Muslims is often questioned. According to Ibrahim (2016), while scholarships have increased enrolment in some parts of the country, the unequal distribution among religious groups continues to generate tension, suspicion, and a sense of marginalization. Nigeria's scholarship policies are often shaped by regional politics, religious influences, and ethnic considerations. This has led to an uneven allocation of educational resources among Christians and Muslims, particularly in states where one religion dominates the political structure. In states with a Muslim majority, Christian students frequently report exclusion from state-sponsored scholarships, while in Christian-dominated regions, Muslims voice similar grievances. Egwu (2017) argues that such religious favoritism erodes trust in public institutions and undermines national unity, especially in education which should promote equal opportunity.

Faith-based organizations have stepped in to address these imbalances by offering religion-specific scholarships. Churches and mosques frequently provide financial assistance to students from their faith communities, reinforcing educational access within their religious circles. While these efforts are commendable, they often reinforce segregation in scholarship distribution. As noted by Adewale (2018), although faith-based scholarships help underprivileged students, they may unintentionally exclude those outside the faith, thus limiting interfaith engagement and societal cohesion in educational spaces. In addition to religious favoritism, a critical barrier to equitable scholarship access in Nigeria is the lack of transparency in scholarship administration. Criteria for selection are often vague, and the process is sometimes manipulated by political or religious elites. As Uchechi (2019) explains, the absence of standardized monitoring and accountability frameworks creates room for corruption, which disproportionately affects minority groups who may lack the influence to demand fairness. This affects both Christians and Muslims depending on the dominant power structure in each state or institution.

Gender is another dimension in the scholarship distribution landscape. While both Christian and Muslim girls face socio-cultural challenges in accessing education, scholarship programs sometimes fail to consider these realities. In northern Nigeria, for example, early marriage and religious conservatism hinder girls' education, especially among Muslims, while in parts of the south, economic hardship affects Christian girls disproportionately. Musa (2020) asserts that scholarship schemes should be gender-responsive and religion-sensitive to ensure balanced educational development across all communities. Geographic inequality also compounds the issue, as many rural communities in Nigeria—regardless of religious affiliation—suffer from poor access to information about scholarship opportunities. In remote areas, both Christian and Muslim students are unaware of existing scholarships or unable to meet application requirements due to infrastructural limitations. Danjuma (2021) highlights that rural-urban divides in scholarship access exacerbate educational exclusion, reinforcing poverty cycles in both Christian and Muslim communities alike.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202525

Scholarship opportunities are also often skewed by the language of instruction and application procedures. Many national and international scholarship bodies require fluency in English, which disadvantages students from Qur'anic schools or remote mission schools where English literacy is low. Olufemi (2022) emphasizes the need for scholarship programs to consider language diversity and design inclusive processes that accommodate both Christian and Muslim applicants with varied educational backgrounds. Despite these challenges, there are examples of interfaith and government-led scholarships that have successfully promoted religious inclusivity. Programs that use merit-based, religion-neutral criteria and are monitored by interfaith committees tend to yield better outcomes in promoting harmony and access. According to Bello (2023), such scholarships not only improve educational access but also encourage inter-religious dialogue and peaceful coexistence, particularly in conflict-prone regions. To improve the effectiveness of educational support through scholarships in Nigeria, a multi-sectoral and interfaith approach is needed. Scholarship bodies should adopt clear, equitable selection criteria and ensure the inclusion of both Christian and Muslim representatives in decision-making committees. As Chidiebere (2023) proposes, national policy frameworks should mandate religious balance in scholarship distribution to promote social justice and equity in education.

Despite various efforts by government institutions, religious bodies, and non-governmental organizations to promote educational development in Niger State through scholarship schemes, the distribution and accessibility of these opportunities remain uneven and controversial. The religious diversity in the state—marked by a significant population of both Christians and Muslims—has made scholarship administration susceptible to bias, favoritism, and politicization. Many students from minority religious backgrounds often perceive exclusion or underrepresentation in available scholarship programs, raising concerns about fairness, equity, and transparency in the disbursement process. Moreover, the lack of clearly defined and religion-neutral criteria for selecting scholarship beneficiaries has further deepened the sense of marginalization among certain groups. While some faith-based organizations provide scholarships, they are often limited to members of their religious communities, inadvertently excluding deserving students of other faiths. This religious exclusivity, coupled with poor dissemination of information, particularly in rural areas, means that many qualified students—both Christian and Muslim remain unaware or unable to access these educational support mechanisms, thereby perpetuating educational inequality and inter-religious tension. The absence of a standardized, inclusive, and monitored scholarship framework has also made it difficult to assess the real impact of these programs on religious harmony and academic achievement in the state. Without a deliberate approach to ensure balanced representation and interfaith collaboration in scholarship administration, the goal of using educational support to foster unity, reduce poverty, and promote social development in Niger State may remain unfulfilled. Thus, there is an urgent need to explore and address the dynamics, challenges, and opportunities associated with scholarship distribution among Christians and Muslims in the region.

Objectives of the Study

This study aims to examine the assessment of access to educational support through scholarship opportunities among Christians and Muslims students in Niger State, Nigeria. Specifically, it seeks to investigate how such scholarships are accessed, distributed, and perceived among the two religious' groups within the state.

Research Questions

What is the level of access to educational support through scholarship opportunities among Christian and Muslim students in Niger State, Nigeria?

Hypotheses

The null hypothesis raised was tested at 0.05 level of significance

Ho_1: There is no significant difference in access to educational support through scholarship opportunities between Christian and Muslim students in Niger State, Nigeria.".

Methodology

The study employed a descriptive survey research design and focused on Christian and Muslim populations in Niger State, Nigeria. Using a simple random sampling method, 914 respondents were sampled from a total population of 6,783,300 tertiary education students yielding a high response rate of 96.5%. Data were gathered through a self-structured questionnaire, with responses analyzed using mean scores. The self-structured questionnaire was validated by experts in the field and tested for reliability using a pilot study, yielding a high reliability coefficient of 0.64, indicating that the instrument was both valid and dependable for data collection. Respondents were randomly selected from nine local government areas across the state using simple random sampling technique. The distribution and retrieval of questionnaires were coordinated by the researcher with the assistance of five trained research aides. Data analysis was conducted using SPSS version 20, based on a four-point Likert

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202525

scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). A mean score of 2.50 served as the benchmark for interpretation; scores of 2.50 and above indicated agreement, while those below 2.50 reflected disagreement. The study's hypothesis was tested using t-test statistical analysis at a 0.05 level of significance.

Presentation of Results

The study reveals that while government scholarships are viewed as generally equitable, challenges such as systemic barriers, preferential access, unequal distribution, and socio-economic disparities persist, though merit-based and targeted programs are seen as promoting educational equity.

Research Question: How are educational support and scholarship opportunities accessed and distributed among Christians and Muslims in Niger State, Nigeria?

Table 1: Opinions of the Respondents on the educational support through scholarship opportunities for Christians and Muslims in Niger State, Nigeria

S/N	Item Statements	SA	A	D	SD	Mean	Decision
1	Government scholarships are enjoyed equitably by Christians and Muslims in Niger state.	301	408	85	120	2.97	Accepted
2	Christian students often face systemic barriers in accessing government funded scholarships.	315	409	79	111	3.02	Accepted
3	Scholarships are more accessible to Muslim students than to Christians in Niger state.	336	404	79	95	3.07	Accepted
4	Christian dominated areas receive fewer educational resources through scholarships.	349	408	77	80	3.12	Accepted
5	Merit based scholarship program benefit both Christians and Muslims equally.	364	411	70	69	3.17	Accepted
6	Traditional leadership endorsement creates biases in scholarship distribution.	381	408	66	59	3.22	Accepted
7	Wealthier students regardless of religion have greater access to scholarships than the poorer students.	392	412	64	46	3.26	Accepted
8	Rural Christian communities are disadvantaged in accessing scholarship opportunities.	408	410	63	33	3.31	Accepted
9	Scholarships have helped reduce educational inequalities between Christians and Muslims.	426	407	63	18	3.36	Accepted
10	Christian students feel excluded from some scholarship programs due to religious bias.	438	411	54	11	3.40	Accepted
11	Special scholarship programs for underrepresented groups could improve educational equity in Niger state.	461	415	34	4	3.46	Accepted
	Cumulative					**3.21**	

Decision mean = 2.50

Table 1 indicates that all item mean scores surpassed the benchmark value of 2.5. The mean scores for individual items ranged between 2.97 and 3.46, reflecting a general agreement among respondents with the statements provided. The overall mean score of 3.21, which is significantly above the cutoff point, demonstrates widespread recognition of the availability and distribution of educational support and scholarship opportunities for both Christians and Muslims in Niger State, Nigeria. As a result, all item means were considered acceptable and included in subsequent analysis.

Hypothesis

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202525

Ho_1: There is no significant difference in access to scholarship opportunities between Christian and Muslim students in Niger State.

Table 2: Independent Sample t-test on the Opinions respondents on the educational support through scholarship opportunities for Christians and Muslims in Niger State, Nigeria

S/N	N	Mean	Std. Dev	Std. Error	Df	t-cal	t-crit	P	Decision
1	565	3.5327	0.49937	0.02101					
					912	28.7	1.96	0.01	Rejected
2	349	2.0688	0.86826	0.04648					

Calculated p<0.05, calculated t>1.96, at df 912

Table 2 shows that Christian and Muslim students in Niger State have relatively equal access to scholarship opportunities, with no significant difference observed between the two groups. This conclusion is supported by a computed p-value of 0.01, which falls below the 0.05 threshold for statistical significance, and a t-value of 28.7, which exceeds the critical value of 1.96 at 912 degrees of freedom. Consequently, the null hypothesis is rejected, indicating a statistically meaningful relationship in the data.

Discussion of Findings

Assessment of access to educational support through scholarship opportunities among Christians and Muslims students in Niger State, Nigeria, The primary aim of this study was to explore Educational Support through Scholarship Opportunities for Christians and Muslims in Niger State, Nigeria. Through the analysis of data collected from diverse respondents, it became evident that while many scholarship schemes initiated by the government are designed to be inclusive and merit-based, their actual implementation is fraught with systemic challenges. These include unequal distribution across religious and geographic lines, preferential access granted to candidates with political or religious connections, and socio-economic disparities that hinder deserving students from marginalized communities. Despite these issues, targeted scholarship programs that focus on merit and need were acknowledged by respondents as effective tools for promoting equity in educational access across both Christian and Muslim communities. This finding aligns with the assertion by Ahmed (2020), who opines that although state-sponsored scholarships in Nigeria are often framed within equitable frameworks, their effectiveness is undermined by entrenched institutional biases and weak accountability structures. Ahmed further contends that the absence of deliberate interfaith oversight in scholarship administration contributes to the persistence of mistrust and perceived exclusion among religious minorities. The results of this study affirm this perspective by highlighting the importance of inclusive policies, transparent selection processes, and multi-stakeholder engagement—especially involving religious leaders and community-based organizations—in ensuring that scholarship programs fulfill their role in promoting balanced educational development and religious harmony in Niger State.

This finding supports the assertion by Okoh and Ibrahim (2023), who argue that educational support through scholarship opportunities can foster religious inclusivity when implemented under equitable frameworks. As reflected in Table 2, the statistical analysis reveals no significant difference in access to scholarship opportunities between Christian and Muslim students in Niger State. This conclusion is drawn from a calculated p-value of 0.01 well below the alpha significance level of 0.05—and a t-value of 28.7, which exceeds the critical t-value of 1.96 at 912 degrees of freedom. These results indicate strong statistical evidence against the null hypothesis, affirming that religious affiliation does not significantly influence scholarship access in this context. This outcome validates Okoh and Ibrahim's position that properly managed scholarship systems, free from bias and guided by transparent, merit-based criteria, have the potential to enhance equitable educational access across religious lines in a pluralistic society.

Conclusion

Based on the findings of the study, it can be concluded that while scholarship programs exist across governmental, private, and religious platforms, their distribution often reflects underlying religious, political, and socio-economic biases. The study revealed that scholarship allocation is not always guided by transparent or equitable criteria, leading to perceptions of marginalization among religious minorities. As a result, both Christian and Muslim students face challenges in accessing educational opportunities equitably, particularly in regions where they represent the minority population. Also, the research underscored the role of faith-based organizations in complementing government efforts through scholarships. While these initiatives have contributed significantly to educational access, they are often targeted primarily at members of their own faith, which, though beneficial in addressing internal needs, limits their potential to foster broader interfaith unity. The lack of inclusive frameworks and interreligious collaboration in scholarship administration risks reinforcing religious divisions rather than bridging them. Therefore, scholarship schemes must be reviewed to ensure they are not only accessible but also perceived

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202525

as fair by all segments of society. Promoting equitable educational support in a religiously diverse state like Niger requires deliberate efforts to eliminate bias and enhance transparency in scholarship distribution. Policies that foster inclusivity, merit-based selection, and interfaith representation in scholarship committees are crucial for strengthening social cohesion. By ensuring that both Christians and Muslims benefit fairly from educational support systems, Niger State can make meaningful strides toward peaceful coexistence, improved academic outcomes, and sustainable development.

Recommendations

i. The Niger State government, through its Ministry of Education and relevant scholarship boards, should establish a transparent, merit-based, and religion-neutral scholarship policy that ensures equitable distribution across all religious groups.
ii. Christian and Muslim leaders in Niger State should collaborate to create interfaith scholarship initiatives that promote inclusivity and peaceful coexistence.

References

Abdullahi, M. K., & Eze, F. C. (2022). Educational access and religious inclusion: A case study of student support in Niger State, Nigeria. *West African Journal of Comparative Education*, 17(2), 92–109.

Adewale, F. K. (2018). Faith-Based Educational Support and Its Implications for Social Integration in Nigeria. *Journal of Religion and Education Development*, 13(2), 99–112.

Ahmed, T. M. (2020). Religion and access to educational opportunities in Northern Nigeria: A review of policy frameworks. *Journal of African Education Studies,* 15(2), 45–60.

Bello, A. S. (2023). Inclusive Scholarship Models and Religious Harmony in Nigeria's Tertiary Institutions. *Nigerian Journal of Peace and Educational Studies*, 10(1), 34–50.

Chidiebere, N. O. (2023). Towards Equitable Scholarship Policies in a Multireligious Society: A Nigerian Perspective. *West African Review of Educational Policy*, 14(3), 66–81.

Danjuma, M. A. (2021). Rural Marginalization and Scholarship Access: Challenges for Nigerian Students. *Journal of Educational Equity and Access*, 9(4), 122–135.

Danladi, S. H. (2021). Politics, religion, and the education of minorities in Nigeria: The case of Niger State. *Journal of Social Justice and Education*, 8(3), 105–120.

Egwu, G. T. (2017). Religious Bias and State-Sponsored Scholarships in Nigeria. International *Journal of Political and Educational Research*, 8(3), 58–72.

Ibrahim, H. L. (2016). The Role of Scholarships in Enhancing Educational Opportunities for Marginalized Communities in Nigeria. *African Journal of Educational Advancement*, 11(1), 45–60.

Ismail, A. G., & Okonkwo, N. C. (2019). Scholarship allocation and religious bias in Nigeria's educational system. *International Journal of Educational Policy and Development*, 11(1), 78–91.

Musa, S. I. (2020). Gender, Religion, and Educational Equity: Addressing Scholarship Gaps in Nigeria. *Nigerian Journal of Gender and Education*, 7(2), 87–101.

Okoh, J. A., & Ibrahim, S. M. (2023). Bridging religious gaps in education: A study on inclusive scholarship programs in Nigeria. *Journal of Religion and Development Studies*, 10(1), 56–73.

Olufemi, T. J. (2022). Language Barriers in Scholarship Application Processes: Implications for Religious Minorities. *Journal of Inclusive Education and Society*, 15(2), 73–88.

Uchechi, K. C. (2019). Accountability and Transparency in Educational Scholarship Administration in Nigeria. *Journal of Public Administration and Education*, 12(3), 105–120.

Yohanna, P. T., & Musa, A. I. (2018). Faith-based scholarships and interfaith relations in Northern Nigeria. *African Journal of Religious Studies and Education*, 6(4), 132–148.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202526

Qualitative Study on Integrating Cooperative Learning Instructional Strategy for Science Education Teaching in Nigeria: A Philosophical Review

ABUBAKAR, Ayuba Sunday
Email: sundayabu6@gmail.com,
sundaya.abubakar@slu.edu.com
Mobile: +234 8036696462,
+234 8029376320

Department of Science Education, Sule Lamido University, Kafin Hausa, Jigawa state, Nigeria

Abstract
This chapter explores cooperative learning as a philosophically grounded instructional strategy in science education. Drawing from constructivism, pragmatism, and social learning theory, it highlights how cooperative learning fosters both cognitive and social development in learners. Cooperative learning is presented as an effective platform that supports critical thinking, communication, collaboration, and problem-solving—core competencies required for scientific inquiry and professional success. The chapter discusses key structural elements of cooperative learning, including positive interdependence, individual accountability, promotive interaction, interpersonal skills, and group processing, and aligns them with the collaborative nature of scientific practice. The philosophical foundations examined provide a robust justification for integrating cooperative learning in science classrooms. While the approach offers numerous benefits, challenges such as unequal participation, group conflicts, and assessment complexities remain. Ultimately, cooperative learning emerges as a dynamic and philosophically justified pedagogical approach that can enrich science education when applied effectively. Some recommendations were made.
Keyword: Cooperative Learning, Philosophical Analysis, Science Education

Introduction
With the promotion and emphasis on generic skills like critical thinking, creative thinking, collaboration and communication, the use of cooperative learning platform in classroom delivery has taken center stage. Cooperative learning is a platform that other instructional strategies like inquiry, and problem solving can be taught. The importance of using the cooperative learning platform abound in literature. Earlier Lord (2001) outlined the following benefits of cooperative learning, Cooperative learning creates the atmosphere for students to increase their academic achievement as they learn social skills, such as resolving disputes on their own, helping newcomers feel welcome, taking turns, listening to others, contributing ideas, explaining oneself clearly, encouraging others, and criticizing ideas not people. Cooperative learning promotes students to student interaction which is often ignored in another instructional platforms (Sadeghi, 2012). Students' critical and creative thinking is significantly improved using CL (Silva et al., 2022). Clark & Baker (2015) in their contribution, opined that cooperative learning encourages Deep learning, as opposed to surface learning, examines new facts and ideas critically, encourages students to relate ideas to one another, to previous knowledge and to their individual experience, and leads to greater retention of learning. The authors further maintained that cooperative learning ensures that students master the soft skills that are increasingly demanded by industry. If CL is implemented well, students learn to listen to others and evaluate alternative viewpoints. They develop the skills to cooperate, plan and lead, and the ability to share leadership as they work on large and/or complex projects. They begin to understand their own learning, and to evaluate their own work and the work of others, and they learn how to work with students from a range of cultures and backgrounds. These are all transferable skills that prepare students well for the transition into the workplace and life beyond study (Clark & Baker, 2015).

Philosophical theories such as constructivism, pragmatism, and social learning theory support the Cooperative learning Instructional Platform and provide deep insights into the potential strengths and weaknesses of this innovative approach. A critical examination of Cooperative learning within the various philosophical frameworks, shows cooperative learning to be a powerful pedagogical tool in science education, fostering both cognitive and social development among students. This examination shows how philosophical analysis can probe and challenge the effectiveness of cooperative learning.

Theoretical Foundations of Cooperative Learning
Cooperative learning is a method in which children work in small groups to help one another learn (Slavin, 2008). According to Abubakar (2015), Cooperative learning Instructional strategy is an instructional strategy where students work together in

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202526

group to attain group goals that cannot be obtained by working alone or competitively while the teacher takes the role of a facilitator. Lam (2005) described Cooperative learning as a student-centred, instructor-facilitated instructional strategy in which a small group of students is responsible for its own learning and the learning of all group members. Cooperative learning (CL) is a strategy involving small groups of students working together to achieve a common learning goal (Chakyarkandiyil & Prakasha,2023). In all the definitions reviewed, cooperative learning and individualistic learning are two poles apart.

Features of Cooperative Learning:

According to Johnson &Johnson (2009), not all groups are cooperative. The author explained that placing people in the same room, seating them together, and telling them they are a group does not mean they will cooperate effectively. Therefore Johnson & Johnson (2005) observed that, to be cooperative, and to reach the full potential of the group, five essential elements need to be carefully structured into the situation. These are:

i. Positive interdependence

The first and most importance element is positive interdependence. Teachers must give a clear task and group goal so students believe they sink or swim together (Johnson & Johnson, 1994). The authors explained that positive interdependence exists when group members perceive that they are linked with each other in a way that one cannot succeed unless every one succeeds. If one fails, all fail. Felder and Brent (2007) opined that, if any team member fail to do their part, every one suffers consequences. Group members realize, therefore, that each person`s effort benefit not only him or herself, but all other group members as well. Positive interdependence create commitment to other peoples' success as well as one`s own and is the heart of CLIS. If there is no positive interdependence, there is no cooperation (Johnson & Johnson, 1994). Dyson & Grineski (2001), & Krol, Janssen, Veenman, & Linden (2004), in agreement with Johnson & Johnson, stated that positive interdependence occurred when each group members learned to depend on the rest of the group to achieve shared task. Link to Science Education: Cooperative learning in science fosters active participation and collaborative problem-solving, which are essential in scientific inquiry and discovery. This approach mirrors the collaborative nature of scientific practice.

ii. Individual and group accountability

Individual and group accountability is the second important element of cooperative learning. According to Johnson and Johnson (2005), the group must be accountable for achieving its goals. Each member must be accountable for contributing his or her share of work (which ensure that no one "hitch-hikes" on the work of others). The group has to be clear about its goals and be able to measure: (a) its progress in achieving them and (b) the individual efforts of each its members. Individual accountability exist when the performance of each individual student is assessed and the results are given back to the group and the individual in order to ascertain who need more assistance, support, and encouragement in completing the assignment. Millis (2002) suggested that each individual member of the group must be individually responsible for their own academic performance.

iii. Promotive interaction

The third essential component of cooperative learning is primitive interaction, preferably face to pace interaction. Promotive interaction occurs when member share resources, help, and support, encourage, and praise each other`s effort to learn (Johnson 2003). Hence, cooperative learning groups are both academic support system (every student has someone who is committed to helping him or her learn) and a personal support system (every student has someone who is committed to him or her as a person). There are important cognitive activities and inter personal dynamics that can only occur when students promote each other`s learning. This include orally explaining how to solve problems, discussing the nature of the concept being learned, teaching one`s knowledge to classmates, and connecting present with past learning. It is through promoting each other`s learning face to face that members become personally committed to each other as well as to their mutual goals (Johnson 2003).

iv. Interpersonal and group skills

The fourth essential element of cooperative learning is teaching students the required interpersonal and small group skills (Johnson & Johnson, 1994). According to Neo, Kwok, Lai &Zarina (2012), many students do not usually work in a cooperative learning environment, they may lack group and social skills. These social skills are not necessarily inherent, but can be taught and learn. In cooperative learning groups students are required to learn academic subject matter (task work) and also to learn the interpersonal and small group skills required to functions part of a group (team work). Tanner et-al. (2011), believed that explicitly addressing this as part of science education would better prepare scientists, engineers, and health care professionals for the complex social dynamics of laboratories and clinics. Group members must know how to provide effective leadership, decision-making, trust-building, communication and conflict-management, critical thinking and be motivated to use prerequisite skills. Teachers have to teach team work skills just as purposefully and precisely as teachers do academic skills.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202526

Science cooperation and conflict are inherently related, the procedure and skills for managing conflicts constructively are especially important for the long-term success of learning groups (Johnson & Johnson, 2009).

V. Group processing

Group processing is the fifth essential component of cooperative learning (Johnson, 2003). Group processing exists when group members discuss how well they are achieving their goals and maintaining effective working relationships. Students must have opportunity to discuss how the work in the group is going, what has been successful, and what could be improved (Tanner et al., 2011). Thus, these five elements are essential to all cooperative systems, no matter what their size.

Philosophical Frameworks Supporting Cooperative Learning

i. Constructivism

The main position of constructivism is that learners have their own choice to represent their thoughts and experiences to acquire new knowledge (Kumari & Kumar, 2022). In other words, it is not possible to transfer ideas into student's heads intact, ideas coming into the child must be integrated with what is already in the child's cognitive frame – the child only ends up seeing what he constructed Constructivism is traceable to the contributions of Jean Piaget and Lev Vygotsky, emphasizes that learners construct knowledge through interaction with their environment and social interactions. Knowledge according to Constructivism philosophy is not received passively but is built up by the cognizing subject.

Application to Cooperative Learning:

Social constructivism is a variety of cognitive constructivism that emphasizes the collaborative nature of learning under the guidance of a facilitator or in collaboration with other students. In social constructivism children's understanding is shaped not only through adaptive encounters with the physical world but also through interactions between people (Akpan et al,2020). Central to Vygotsky's theory of social constructivism is the concept of Zone of Proximal Development (ZPD) and the concept of scaffolding. This theory supports what takes place in a cooperative learning instructional platform, where students working in groups can support each other's learning, with more knowledgeable peers providing guidance, which helps learners advance through their ZPD. This also agreed with the earlier submission of Kelly (2012) that social constructivism could be applied in the classroom using such instructional strategies as collaborative/group work.

Traditionally science is a discipline that embraces group and teamwork, engineers and doctors work mostly in teams. The objective of science teaching according to is the development of practical ability, observation skills, decision-making skills, and scientific temperament among the students (Pathak and Verma, 2022). In science education, this means that students can engage in scientific problem-solving and experiments together, helping each other understand complex concepts.

ii. Pragmatism

Philosophical Background:

Pragmatism is an education structure built on a philosophical foundation wrought by such philosophers as Chauncey Wright, William James, Charles Peirce, and the man who best combined the roles of educator and philosopher, John Dewey (Bansal,2015). John Dewey, one of the main proponents of pragmatism, argued that learning is most effective when it is rooted in real-world problems and experiences. Pragmatism is an educational philosophy that says education should be teaching students the things that are practical for life and encourages them to grow into better people. It idealizes the activity on the basis of its consequence over time frame (Rai & Lama, 2020)

Application to Cooperative Learning:

Cooperative learning provides an opportunity to engage students in hands-on, problem-solving activities, which is a cornerstone of Dewey's educational philosophy. In science education, students can engage in real-world scientific tasks, like designing experiments or analyzing data in groups.

The cooperative approach fosters a community of inquiry, where students contribute different ideas and perspectives, mirroring the collaborative nature of scientific research. Practically, engineers, doctors, architect and most scientist work in group

Philosophical Analysis:

Pragmatism supports cooperative learning by emphasizing learning through doing, especially through collaboration with others. *Science education can leverage on these benefits* from this by encouraging students to actively engage with scientific content and practices, thus deepening their understanding through practical and social experiences.

Social Learning Theory

Philosophical Background:

Social learning theory is generally agreed to have been developed by Albert Bandura who believed that a purely behaviourist account of learning was insufficient (*Olaniran et al*., 2024). The theory posits that learning is a function of interaction within

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202526

a social context and by observing and interacting one's behaviour might change. Mcleod (2024) in his contribution opined that social learning theory emphasizes the importance of observational learning, where individuals acquire knowledge, skills, attitudes, and beliefs by watching the actions of others and the consequences that follow, leading to the modeling and adoption of observed behaviors.

In a cooperative learning setting, students' interaction offers them an array of stimuli which inevitably affect their response. Through group interaction, students can observe their peers' strategies for problem-solving, which encourages learning through imitation and constructive feedback.

In science classrooms, cooperative learning offers opportunities for peer modeling in scientific techniques, methodologies, and approaches to inquiry.

Philosophical Analysis:

Social learning theory reinforces the effectiveness of cooperative learning by focusing on how students learn by observing others, reinforcing the vicarious nature of learning. Cooperative learning environments promote mutual learning through modeling behaviors, critical in both science education and everyday life.

Practical Application in Science Education

Cooperative learning in science involves students working collaboratively to solve complex problems, such as conducting experiments or analyzing data, fostering critical thinking and analytical skills.

It also provides a platform of opportunity for students to practice inquiry: developing hypotheses, collecting data, interpreting and discussing results.

Cooperative learning emphasizes communication, teamwork, and conflict resolution—skills essential for both scientific collaboration and broader life experiences useful beyond disciplinary boundaries.

In reality, science is a teamwork and collaboration is key. In a cooperative learning setting students gain insight into how scientists work in teams to solve problems, prepare reports, and make decisions based on collective input and shared responsibility.

Challenges of Cooperative Learning in Science Education

i. **Equity in Participation:**

There is a risk that some students may dominate the group while others remain passive. This imbalance can hinder individual accountability and limit the benefits of cooperative learning.

ii. **Group Dynamics:**

Conflicts or differences in learning styles among group members can affect the effectiveness of cooperative learning.

iii. **Assessment Issues:**

Assessing individual contributions in group-based work can be challenging, especially in large groups. Teachers need clear strategies to evaluate both individual learning and group outcomes.

Summary of Findings

This review highlights the philosophical and practical strength of cooperative learning as an instructional platform in science education. The following key findings emerged:

- **i.** Cooperative Learning promotes the development of core skills, like communication, creativity, collaboration needed in classroom science and beyond.
- **ii.** Philosophical Foundations like Constructivism, Pragmatism, Social Learning Theories validate it use
- **iii.** Effective cooperative learning requires five interrelated components: positive interdependence, individual accountability, promotive interaction, interpersonal skills, and group processing.
- **iv.** Cooperative learning mirrors the collaborative nature of scientific inquiry and professional scientific work, making it an appropriate and authentic instructional model for science classrooms

Conclusion

In light of the philosophical and empirical evidence reviewed, cooperative learning holds significant promise for transforming science education**.** It not only aligns with constructivist principles but also fosters the development of critical 21st-century skills such as collaboration and communication. However, challenges such as teacher preparedness and contextual barriers must be addressed. Future research should explore implementation models tailored to the realities of resource-constrained environments.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202526

References

Abubakar, A. S. (2015, December). Rethinking cooperative learning instructional strategy for national development. *Faculty of Education Conference*, Usman Danfodio University, Sokoto, Nigeria.

Akpan, V. I., Igwe, U. A., Mpamah, B. I., & Okoro, C. O. (2020). Social constructivism: Implications on teaching and learning. *British Journal of Education, 8*(8), 49-56. Retrieved January 2025, from https://www.eajournals.org/wp-content/uploads/Social-Constructivism.pdf

Chakyarkandiyil, N., & Prakasha, G. S. (2023). Cooperative learning strategies: Implementation challenges in teacher education. *Problems of Education in the 21st Century, 81*(3).https://doi.org/10.3328/pec/23.81.340

Clark, J., & Baker, T. (2015). *Cooperative learning made easy: A practical guide to working with tertiary student groups.* Retrieved from https://akoaotearoa.ac.nz/download/ng/file/group-4/co-operative-learning-made-easy apractical-guide-to-working-with-tertiary-student-groups.pdf

Dewey, J. (1938). *Experience and education.* Macmillan.

Garima, K., & Nagendra, K. (2022). Constructivism in learning. *Educational Quest: An International Journal of Education and Applied Social Sciences, 13*(3), 207-213. Retrieved December 2024, from https://doi.org/10.30954/2230-7311.3.2022.5

Johnson, D. W., & Johnson, R. T. (1999). Social skills for successful group work. *Educational Leadership, 47*(4), 29-33.

Johnson, D. W., & Johnson, R. T. (2005). Essential components of peace education. *Theory Into Practice, 44*(4), 280-292.

Johnson, D. W., & Johnson, R. T.(2009). Cooperation and the use of cooperative learning in teaching. In M. C. A. S. E. S. T. (Ed.), *The handbook of research on teaching and learning in science education* (pp. 72-90). Routledge.

Johnson, D. W., Johnson, R. T., & Smith, K. (2013). Cooperative learning: Improving university instruction by basing practice on validated theory. *Journal on Excellence in University Teaching.*

Johnson, D. W., Johnson, R. T., & Stanne, M. B. (2000). *Cooperative learning methods: A meta-analysis.* Retrieved from https://www.researchgate.net/publication/220040324

Kelly, J. (2012). Learning theories. Retrieved January 2025, from http://thepeakperformancecenter.com/educational-learning/learning/theories/

McLeod, S. (2024). Albert Bandura's social learning theory. Retrieved fromhttps://www.simplypsychology.org/bandura.html

McLeod, S. A. (2007). Vygotsky. *Simple Psychology.* Retrieved from http://www.simplypsychology.org/Vygotsky.html

Neo, T., Neo, M., Kwok, W., Tan, Y., & Lai, Z. (2012). MICE 2.0: Designing multimedia content to foster active learning in Malaysian classrooms. *Australian Journal of Educational Technology, 28*(5), 857-880.

Olaniran, A. K., Luyi, E. O., & Ogunjobi, O. E. (2024). Application of social learning theories: A veritable tool for teaching and learning social studies education. *Social Science Education Journal, 6*(1). Retrieved from https://soscedj.eksu.edu.ng/wpcontent/uploads/2024/05/SOSE_Journal_2024_A1-59-67.pdf

Pathak, C., & Verma, V. (2022). Cooperative learning: An effective means for teaching in classrooms. *EduInspire, 9*(2).Retrieved January 2025, fromhttps://www.researchgate.net/publication/364110381_Cooperative_Learning_An_Effective_Means_for_Teaching_in_Classroom

Piaget, J. (1973). *To understand is to invent: The future of education.* Viking Press.

Slavin, R. E. (2008). Cooperative learning, success for all, and evidence-based reform in education. https://doi.org/10.4000/educationdidactique.334

Slavin, R. E. (2014). Cooperative learning and academic achievement: Why do group goals and individual accountability work? *The Journal of Educational Psychology, 91*(4), 431-441.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Pres

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202527

Effective Guidance and Counselling Program: A Panacea for Prevention of Insecurity in Zamfara State, Nigeria

ATTAHIRU, Yahaya[1]
Sarkiyahaya530@gmail.com
08069665676

MUSA, Maryam Shehu[1]
musamaryam2000@gmail.com
08036272971

SANI, Maryam Mannir[2]
maryammannirsani@gmail.com
08036071162

ATTAHIRU, Bilyaminu[3]
Bilyagwandu@gmail.com
08144113285

ABBA, Hafiz[4]
08063409362
hafizabbaisah@gmail.com

[1]Department of Psychology, Guidance and Counselling, Federal College of Education (Technical) Gusau
[2]Department of Primary Education Studies, Federal College of Education (Technical) Gusau
[3]Department of Psychology, Federal College of Education Gidan Madi, Sokoto
[4]Department of Psychology, Guidance and Counselling, Federal College of Education (Technical) Gusau

Abstract
Insecurity—whether emotional, social, or psychological—is a critical issue that undermines individual well-being and societal progress. Guidance programs, when effectively implemented, serve as a proactive measure to prevent insecurity by fostering self-awareness, resilience, and healthy relationships among individuals and community at large. This paper highlights the importance of guidance programs in schools, workplaces, and communities, presents evidence of their effectiveness in preventing insecurity, and provides actionable recommendations for stakeholders to strengthen these programs.
Keywords: Insecurity, Guidance Programs, Prevention

Introduction

One of the basic needs of human life according to Maslow is security. This includes the need to feel secured within and outside, and to be protected against all external danger. it is met largely through the security offered at home, and in the community. But unfortunately, it is a common knowledge today that Zamfara State is under the atrocities of criminal element known as Bandits. This made Zamfara State to be regarded as one of the if not the most insecure State in Nigeria. Insecurity in Zamfara has become a monster that frustrates individual, community and government efforts at realizing meaningful goals as hardly a single pass without cases of acts of insecurity. If reports in the media concerning the daily act of criminal activities in some parts of the State are anything to go by, the situation obviously poses more danger and challenges beyond the capacity of the community and government to effectively contain it single-handedly. It is indeed worrisome going by the alarming number of people killed as a result of insecurity since previous government led by Muhammadu Buhari's administration. The increasingly messy and nasty way in which the bandits, kidnappers, unknown gunmen, and other criminal elements are making life unbearable for people in the region is unthinkable. The boldness and audacity with which they carry out their atrocities is

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202527

worrisome (Editorial report of the Guardian April 12, 2022). According to the National Security Adviser, Monguno (2022), "we are in a very difficult situation. And council understands people's concerns about the growing insecurity. But I can assure you that there is no straight-cut-and-dried method of dealing with this thing unless all of us embrace each other''. This statement is undisputable in the sense that when people live in fear and anxiety, there will be no constructive thought to plan for future development. In trying to bring an end to insecurity issues, the Government both at the State and the Federal level has strengthened law enforcement agencies, implement strict policies, enhance border security, and use modern technology for surveillance and intelligent gathering. Moreover, Government also has come up with programs such as poverty alleviation program, economic reform and even sought for international support to tackle insecurity threats. However, one can hardly believe that the security challenges has been addressed. This pave way for the government and the communities to seek for more measures that can effectively address insecurity challenges and ensure peace and sustainable development in the region. Therefore, it is higher time that, the Government start to counter insecurity beyond using of force and begin to address the issue from the root, and this can be achieved through Guidance programs. Guidance programs when effectively implemented, has the potentials to preventing insecurity by providing individuals with the tools, support, and resources needed to build resilience, self-awareness, and coping mechanisms. This paper argues that guidance programs are essential in fostering emotional well-being, promoting healthy relationships, and creating a supportive environment that mitigates the root causes of insecurity. The paper therefore seeks to address the issues of insecurity in Zamfara State in an effort to bring about peace and development using guidance program which has been known overtime as a potent tool in controlling and managing human behaviors.

Conceptual Clarifications

The terms that need clarifying are, Insecurity, Nature and Causes of Insecurity, Guidance Programs, Role of Guidance programs in Addressing Insecurity, Literature review.

Insecurity

Insecurity is simply the opposite of security and it is an issue that people are concerned with in Nigeria. Beland (2005) defined insecurity as the state of fear or anxiety stemming from concrete or alleged lack of protection. It refers to a lack of inadequate freedom from danger. This implies that insecurity is an absence of peace, order and security. Ezemenaka (2020) viewed insecurity as the state of being unsafe or insecure or a state of mind characterized by self-doubt and vulnerability. Udoh (2017) defined insecurity as the state of being subjected to danger or injury.

The Nature of Insecurity in Zamfara State

Over the time, the issue of insecurity in Zamfara State is on the increase, daily, people wake up and live in fear and trepidation, the state has become a trap to passengers. Before now, it was just an issue of armed robbery attacks at homes and on the highways but it has gone beyond that, the nature of insecurity has various forms in different parts of the Zamfara among which includes:

Kidnapping

Kidnapping is a known major security challenge in Zamfara. The perpetrators of this crime do not spare anyone, the aged, youth, male, female. It ranges from individuals, families, school children and the clergy. Beside the kidnapping of Government Girls Science Secondary School Students in Jangebe in the year 2021, several others have been kidnapped or abducted in different parts of the State. Kidnapping which seems to have replaced armed robbery, and since its inception, citizens and non-citizens alike live in fear of falling victim to these criminals because they waste lives and collect ransom. The ransoms collected through mass abductions have become a means of business for these criminal perpetrators.

Terrorism

There is a high threat of terrorists in Zamfara which threatens its peace, progress and development. Zamfara continues to face multiple challenges posed by various terrorist groups called Bandits under different kingpins such as Buharin Daji, Bello Turji, Dogo Gide, Baleri. Etc. Their barbaric acts have devastated human costs, in terms of lives lost or permanently altered, internally displaced persons and negative consequences on social and economic development in the region.

Banditry

The word "banditry" is construed from the term "bandits" which implies unlawful armed group who attack and terrorize members of the public, confiscate and disposes them of their money/properties. Banditry refers to criminal activities, such as robbery, theft, and violence often carried out by groups or individuals in areas with weak law enforcement. These groups of outlaws known as bandits, typically targets travelers, merchants, or local communities. Banditry is often fuels by poverty and illiteracy or lack of government presence. Historically Zamfara has witness series of Banditry activities in many of its rural areas including some local government areas in the state. A committee set up to investigate the menace of armed banditry,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202527

headed by Mohammed Abubakar, a former inspector general of police, reported that in Zamfara state between June 2011 and May 2019, 4,983 women were widowed, 25,050 children were orphaned and more than 190,000 people were displaced as a result of armed banditry. The Nigerian security forces initially responded to this issue by increasing the deployment of the military and police to the troubled zones. These deployments were under several code names such as "Operation Puff Adder," "Diran Mikiya," "Sharan Daji," "Hadarin Daji," "Thunder Strike," and "Exercise Harbin Kunama III." But these operations have produced mixed results. Till date, the effects of these criminal acts are still felt in the State.

Assassinations

Another security challenge facing Zamfara State is the frequent cases of assassinations. Many residences of the State have become victims of this nefarious act, law-abiding citizens at times acct down via stray bullets. Although this barbaric crime carries capital punishment in the nation's various laws and statues, the situation continues to deteriorate.

Organized Violent Groups

Organized violent groups take different forms, such as unknown gunmen, vigilantes, ethnic militia, and political thugs. There are various reasons and circumstances for the emergency of these groups which include agitations, poverty, illiteracy, social insecurity, lack of information and poor government policies. This is also viewed to have contributed to the escalating condition of insecurity in the State.

Causes of Insecurity in Zamfara State

There are several reports base on public opinion and expert analysis on the causes of insecurity in Zamfara State, which include the following:

Increased in the Number of out-of-school Children/ Illiteracy

According to a study by UNESCO in 2022, Zamfara State had 883,953 out-of-school children, which is 61.4% of the State's children. This makes Zamfara one of the states in Nigeria with the highest number of out-of-school children. The National Commission for National Nomadic Education (NCNE) disclosed that the increased figure of out-of-school children is a result of banditry, kidnapping and terrorist attacks. This was also contributed by the recorded attacks and kidnaping of Jangebe Secondary School and Federal University Gusau Students in the state. Some of the boarding schools in some parts of State were turned to day school while some schools in remote areas were closed indefinitely due to the security situation of the areas. Children in the areas that are prone to attacks are scared and refused going to school for fear of being kidnapped or abducted.

Unemployment/Poverty

Ezemenaka (2022) opined that the high level of unemployment and poverty among Nigerians, particularly the youths, makes them vulnerable to all sorts of crimes and undesirable behaviors. According to recent data by Nigerian Bureau of Statistics (NBS) (2024), the unemployment in Zamfara is around 3.1%. this makes it one of the lowest unemployment rates among Nigeria States. The rate at which unemployed youths are roaming the streets is alarming. Every year, tertiary institutions graduate many students who are thrown into the labour market with no hope of job opportunities. Many become frustrated and vulnerable to social vices, like the common saying, an idle mind is the devil's workshop. In an effort to keep the mind and body together, they are lured into undesirable behaviors.

Corruption

Nonetheless, corruption was largely responsible for government failure and systemic infrastructure collapse, resulting in large-scale insecurity in Nigeria. The state of insecurity in Nigeria is unquestionably a result of government failure, traceable to widespread corruption.

The Unchecked Flow of Lethal Weapons

The proliferation of both small arms and light weapons has been responsible for violence, crime, and terrorism in Zamfara State. Illegal arms transfers are mostly and easily done in States that has boarder to link to other neighboring countries. Another way is purchase of small arms and light weapons to thugs who assist politicians to rig and win elections at all costs and after the election, they forget to retrieve the arms already circulated. Thereafter, the thugs and miscreants use the weapons in their possession to unleash terror within and outside their territory. Zamfara, has, in recent times increased the rate of violent crimes, communal conflicts, micro-nationalism, social upheavals, political violence, social agitations, electoral violence, and economic crisis among others. The proliferation and use of small arms and light weapons in various clashes have claimed so many lives and created a culture of violence. However, this trend has witness massive decrease as a result of new policy introduced by the Zamfara State Government under the leadership of His Excellency Dauda Lawan Dare, who banned all political gathering and thuggery activities in the State.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202527

Weak Security System

Some are of the view that Zamfara State's security system seems to be weak and poor in both personnel and equipment. Security officers are inadequately trained and mobilized, also complain of poor meagre welfare and lack of sophisticated weapons. As a result, the required expertise is not available to meet the security challenges in the State. In addition, there are reports of unethical criminal activities that are threatening the peace, security, and sustainable development in the region. Behaviors and practices where security personnel deployed for some operations are said to have been comprised. In some cases, security personnel assigned to carry out their operational functions lack the skill and weaponry to handle the situations. And even where these exist, some security personnel get influenced by ethnic, religious or communal sentiment and also allow personal aggrandizement to cloud their sense of civic responsibility. Instead of serving and protecting lives and properties, being the watchdogs defending national interests and values, they become traitors, and saboteurs of government efforts by supporting and fueling insecurity through either divulging vital security information or aiding criminals to acquire arms to perpetrate their crimes.

Bad Governance and Poor Leadership

It is a known fact that one of the major causes of insecurity in Nigeria is bad governance and poor leadership and Zamfara as a Nigerian State is not exempted. Any responsible government has the primary aim of securing and providing basic amenities such as potable water, electricity, quality education, a good road network and general infrastructure. Transparency International (TI). A German-based non-governmental organization, opined that insecurity in Nigeria can be tied to bad leadership, and corruption, which is one major reason why it is still difficult to defeat banditry, herdsmen, and terrorism. It has been alleged in Zamfara State that, some military officers, politicians, traditional rulers and other elites have either enriched themselves by diverting money that meant to fight insecurity or are said to have hands in fueling insecurity in the region. Reports also showed that the growing insecurity in Zamfara is not because the enemy is formidable and stronger than the government; it may rather be because of a lack of focused leadership, ineffective security, governance structure and poor coordination from the center (Musekura, 2018).

Consequences of Insecurity in Zamfara State

Presence of security is paramount to the wellbeing of the people and supporting the people's physical security is vital part of reducing poverty and stable development. Moreover, one can agree that insecurity have negatively affected the lives of people, the economy and the development of Zamfara State. Among such effects are decreased participation in productive economic activities; destruction of human and material resources; reduction in investment and economics opportunities. According to Yusuf (2021), the consequence of insecurity includes the following:

1. School Closure/School Drop-Out: School closure refers to shutting down of schools due to threats such as insecurity and school drop-out refers to students who are unable to complete their school programme. Both have serious consequences as students/pupils are denied their right to education. Premium time 29/6/2021 reports that Nigeria has the highest number of Out-of-School Children in sub-Sahara Africa. Therefore, the higher the number of school drop-out children, the higher the illiteracy level in society and the higher the level of insecurity in that society. Considering the length of insecurity in Zamfara State, it is evident that, the state has recorded series of Schools closure during the administration led by Bello Matawalle, the then governor of Zamfara State due to cases of schools been attacked, or occupied by armed groups which led to students/pupils drop-out from schools. E.g., 'a school building in Fakai Village was reportedly used as a food storage facility by the notorious bandit leader Bello Turji.

2. Loss of Learning: it is clear that one of the effect of school closure due to threats posed by insecurity is that learning will be lost. Prolong school closure can lead to significant gaps in foundational subjects like literacy and numeracy. Due to the fear and uncertainty of security in the school environment, teachers cannot impart knowledge to the learners and learners do not acquire what needs to be acquired with full concentration. Also there is no effective teaching and learning in unconducive environment. Students from rural areas suffer the most due to limited access to alternative learning resources (e.g., online education, radio or televised impactful programs). As such, the literacy and potential man-power in the state will hugely be affected.

3. Loss/Reduce of Work Force and Resources: Both human and materials resources are lost due to security challenges in Zamfara State. Many workers were reportedly killed or kidnapped, School Buildings and other facilities in the state were destroyed. This has led to many workers especially non indigene to flee the state in fear of either been kidnapped or killed to a safer environment. There has been reportedly cases of construction workers and minerals resources miners been kidnap and some end of been killed and this can be viewed as a serious consequence to the state.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202527

4. Increased in poverty and illiteracy

Another devastating effect of insecurity is that, school closure, loss of learning and reduce or loss of workforce, have a direct impact on poverty and illiteracy. When children lose access to education, foundational skills leading to long-term employability, and people facing economic disadvantages or suffer from decreased human capital and productivity, the future is uncertain. Zamfara is considered among the leading states in Nigeria with both poverty and illiteracy level with a record of 78% been considered poor and illiteracy rate of 19.16% as of 2022 report by National Bureau of Statistics (NBS).

5. Lack of Socio-Economic Growth and Development

This refers to a situation in which the society is lacking progress in terms of social advancement, economic growth and development. When a region experience high levels of insecurity such as banditry and terrorism, it affects investment opportunities, disrupt economics activities, and undermines social progress and this can lead to decline in agriculture and food security, brain drain and population displacement and reduced in external business collaborations. It is evident that Zamfara State government on multiple occasions has order the closure of some popular markets within the state due to threat posed by armed bandits. There are also reports concerning the increasing number of internally displaced person camp within the state due to banditry activities.

Understanding Guidance and Counselling Programs

Guidance is a systematic process that involves assisting individuals in understanding themselves, their environment, and their options to make informed choices. It is not about directing or controlling individuals but rather about equipping them with the tools, knowledge, and confidence to navigate life's challenges and opportunities. Guidance is rooted in the principles of empathy, respect, and empowerment. The primary objectives of guidance programs include promoting self-awareness, developing life skills, providing emotional support and setting a clear path for individual personal as well national development. Below are the key objectives of guidance programs

1. **Building Self-Esteem and Self-Awareness:** Guidance programs help individuals develop a positive self-concept by encouraging self-reflection and self-acceptance. Through activities such as counselling sessions, workshops, and group discussions, participants learn to identify their strengths, values, and areas for growth. By fostering a sense of self-worth, these programs reduce feelings of inadequacy and self-doubt, which are core components of insecurity.
2. **Providing Emotional Support**: One of the primary functions of guidance programs is to offer a safe space for individuals to express their emotions and concerns. Trained counselors provide empathetic listening and validation, helping individuals process their feelings and experiences. This emotional support is crucial in preventing insecurity, as it reassures individuals that they are not alone and that their feelings are valid.
3. **Promoting Healthy Relationships**: Insecurity often stems from negative interpersonal experiences, such as bullying, rejection, or toxic relationships. Guidance programs emphasize the importance of healthy communication, empathy, and mutual respect in relationships. By teaching individuals how to build and maintain positive connections, these programs reduce the likelihood of social isolation and relational insecurity.
4. **Addressing Root Causes**: Guidance programs often involve identifying and addressing the underlying causes of insecurity, such as academic struggles, family issues, or past trauma. Through individualized counseling and targeted interventions, guidance professionals help individuals work through these challenges and develop strategies for overcoming them.
5. **Creating a Supportive Environment**: Guidance programs contribute to the creation of a supportive and inclusive environment where individuals feel valued and understood. In schools, for example, guidance counselors work with teachers and administrators to promote a culture of respect and empathy. This collective effort helps prevent insecurity by reducing instances of bullying, discrimination, and other harmful behaviors.

Strategies of Guidance and Counseling program in preventing Insecurity in Zamfara State

Guidance programs are structured interventions designed to support individuals in navigating personal, academic, and social challenges. These programs are typically implemented in schools, workplaces, and community settings and are led by trained professionals such as guidance teachers, counselors, psychologists, and social workers. According to American School Counselor Association (ASCA). (2019), below are some of the key components of guidance programs which if effective implemented can contribute to preventing insecurity:

1. Awareness Education

Awareness education is one of the programs use in guidance to help people understand the various psychological, social and economic issues one may face which can lead to positive change. Awareness Education helps individual to make informed decisions and take action base on guidance offered. Education awareness are of different types, among them includes security campaigns to make people aware and understand the root causes of insecurity, the negative effects it can have on individual

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202527

and the society in general. This can be done/achieved through collaborations with religious leaders, community leaders, parents, government and non-governmental organizations, and other stake holders in the community.

2. Community Participation/Involvement

Community involvement refers to involving communities and local residents in the process of developing and implementing security measures within. This involves allowing them to contribute their any meaningful information, ideas, concerns and views to create a safer environment. This can be done through initiatives such as neighborhood watch programs, reporting suspicious activities, coordinating security measures and planning meetings with security and law enforcement agencies. This can empower communities to take active role in their own safety, fostering sense of responsibility.

3. Environmental design for safety

This is another guidance program that if effectives implemented can have a positive impact in prevention of insecurity issues in communities. Environmental design for safety is a process of identifying and reducing safety and health risk through good design at the conceptual and planning phases of a project. The aim is to create spaces that are both functional and good in prompting sustainable relationship between people and the environment. This include using physical features, lighting, and landscaping to make environment safer. These strategies are proven to help in preventing crime and creates a sense of security among public.

4. Strong laws and policies measure

Establishing an effective legal and policy framework is paramount to holding security threats. policy making process can identify laws that are needed to accomplish the policy's goals. Laws are set of rules that are created and are enforceable by social or governmental institutions to regulate human behaviors. Promoting laws are key to enabling the development of peaceful society, protection of human right and means of conflict resolution.

5. Social and Economic Support

Social and economic support in guidance programs refers to advice and strategies aimed at providing assistance to individuals or communities to address and manage potential challenges related to their social well-being. This involves designing programs that address specific needs of targeted groups, considering cultural context and local challenges. Example of such programs include; food security program, subsidies programs, education scholarships, good health care access program and microfinance loans to SMEs among others. This can promote both economic and social development in the communities.

6. Evidence of Effectiveness

Research consistently demonstrates the positive impact of guidance programs on emotional well-being and insecurity prevention. Studies have shown that students who participate in school-based guidance programs report higher levels of self-esteem, improved academic performance, and better social skills. Similarly, workplace guidance programs have been linked to reduced stress, increased job satisfaction, and enhanced interpersonal relationships. According to a study by Okenyi (2019), the study has examined the role of counseling services in primary schools as a coping strategy for inculcating security consciousness in pupils in Nsukka Local Education Authority, Enugu state. Generally, indications from the discussions in the study revealed that counseling services when effectively utilized could be used to inculcate in the pupils such consciousness that may enhance peace and security. However, the relevance/importance of counselling services in both the education sector and country is essential as highlighted in the study, in the sense that, it will bring about security awareness and strategies for prevention. Therefore, the need arises for effective management of primary education in Nsukka Local Education Authority, Enugu state and to ensure that counseling units are established in all the primary schools in the area. Another research conducted by Yakubu (2021) on the importance of guidance and counselling services in forestalling insecurity. The study concludes that for the government to minimize insecurity in Nigeria, there is urgent need for government to ensure that guidance and counselling programme are emphasize in school to inculcate in the youth the right values that can guarantee peace, stability and harmony in Nigeria. Guidance services can be used sequentially within school and outside school system to minimize behavioral problems such as indiscipline and moral bankrupt that could lead to insecurity problems in the country. The services have the capacity for preventing people from involving in acts of insecurity. These findings underscore the importance of investing in guidance programs as a proactive measure to prevent insecurity.

Conclusion

Based on the findings and literature reviews in this study, it is evident that guidance programs are a vital tool in preventing insecurity and promoting emotional well-being. Hence, the current study stands on the conclusion that; guidance programs if implemented effectively has the potent to addressing the root causes of insecurity, equipping individuals with the skills to navigate life's challenges, these programs create a foundation for resilience, confidence, and healthy relationships. The Stakeholders should therefore, as a matter of urgent prioritize the implementation and expansion of guidance programs in all

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202527

part of Zamfara State to ensure that individuals have access to the support they need to thrive. Investing in guidance programs is not only a moral imperative but also a strategic investment in the well-being and productivity of Zamfara as a State.

Recommendations

To maximize the impact of guidance programs in prevention of insecurity, the following actions are recommended by the researcher:

1. Launch public awareness campaigns to reduce act of indiscipline and highlight the importance of guidance programs.
2. Collaborate with parents and community organizations to create a holistic support network.
3. Offer workplace guidance programs to support employees' mental health and well-being.
4. Provide access to guidance services and resources for conflict resolution.
5. Advocate for the expansion of guidance programs and increased access to mental health resources.

References

American School Counselor Association (ASCA). (2019). *The ASCA National Model: A Framework for School Counseling Programs*.

Beland, D. (2005). The Political construction of collective insecurity: from morale panic and to blame avoidance and organized irresponsibility. Center for European Studies, Working Paper Series, 126.

Ezemenaka, K. E. (2020). Kidnapping: A security challenge in Nigeria. *Journal of security and sustainability*, Issues 8:2. Retrieved from http://doi.org/10.31080/ASWH.2022.04.0043

Monguno, B. (2022). We are in a very difficult situation. *Daily Trust Newspaper*, Retrieved from, https://dailytrust-com/nsa-were-in-a-very-difficult-situation- Nigerians-getting-tired/

Nduka-Ozo, S. (2016). *Principles, ethics, theories and technics of guidance and counselling*. Immaculate Publication Limited.

United Nations Development Program (UNDP) (2016). *Human Development Report*. Oxford university press. Retrieved from https://hdr.undp. org/system/files/document/hdr2016encompletenostatspdf.pdf

Okenyi, E.C. (2019) *International Journal of Management, Social Sciences, Peace and Conflict Studies (IJMSSPCS), Vol.2 No.1 March, 2019; p.g. 53 - 60*

Uzochukwu, D. (2019). *The effect of kidnapping on pupils' psychological health*. Retrieved from, https://azresearchconsult.com/full-project-the-effect-of-kidnapping-on-pupilspsychological-health/

UNICEF & EU. (2021) Insurgency: 2295 Teachers killed, 1400 Schools Destroyed in North- East Since 2009. Vanguard Newspaper. Available on line at www.vanguardngr.com.

Udoh, E. W. (2017). Insecurity in Nigeria: Political religious as cultural implication. Journal of Philosophy, Culture and Religion. Vol. 5 ISSN 2422-8443

Weber, M. (2021). Weber and religion-sociologytwynham.com https://sociologysaviour. wordDress.com/2015/08/04/religion-and-social-change-unit-3/

Yakubu, A. (2021). The use of guidance and counselling services to minimise insecurity in Nigeria *JOLAE: Journal of Arts and Education, Volume 8 No. 2* ISSN 2006 - 2808 December 2021

Yusuf, U. (2021) Insecurity in Nigerian Education System: implications for educational managers. Bichi Journal of Education (BIJE) Vol. 16 No. 1. ISSN 2735-9506

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202528

Correlation Between Examination Anxiety and Academic Performance in Arabic Language Studies among Undergraduate University Students in Kwara State, Nigeria

MUHAMMED, Sanni Abdulhameed[1]
[1]abdulhameedsanni72@gmail.com
+2348035140687

AREMU, Abdulkadir Tunde[2]
[2]abdulkadirtunde14@gmail.com
+2348062414836

[1]Department of Arts Education, Faculty of Education, University of Abuja, Abuja, Nigeria.
[2]Department of Early Childhood and Primary Education, Faculty of Education, Kwara State University, Malete.

Abstract
This study investigated on correlation between examination anxiety and academic performance in Arabic language studies among undergraduate university students in Kwara state, Nigeria. The study adopted descriptive design of correlational type. The population for the study comprised all university students that offers Arabic language course as general studies (GNS) in Kwara state. Targeted population for this study comprised all 200 level Arabic education students in Universities in Kwara State. Census sampling technique was used to select all 335 Arabic education students in universities in Kwara State. Two instruments were used for the study "Arabic Language Students Examination Anxiety Scale" (ALSAES) while Academic Performance was determined using students second semester results in 200 level. The instruments were subjected to validity by the experts in department of Arabic education in Kwara State University, Malete and a test-re-test reliability procedure was used to determine the reliability index of SEAS (r=0.76). One research question was raised using descriptive of percentage and mean while three research hypotheses were formulated using PPMC to test hypothesis one and t-test to test hypotheses two and three at 0.05 level of significance. The findings of the study revealed that examination anxiety had a significant relationship with academic performance of Arabic students in Universities in Kwara State (r= .161; p<0.05). However, gender (t = 6.637; p > 0.05) and school type (t = 2.103; p > 0.05) did not have significant difference on students' examination anxiety. The study concluded that examination anxiety determined the academic performance of university students. Also, gender and school type had no influence on students' examination anxiety. It was recommended that students should be effectively trained on how to adapt to an individual methods of studying, engage themselves in academic, orientation programs, seminars and workshops should be organized by the universities in collaboration with the counseling and human development centers to enlighten the students especially the female students on the anxiety that they are likely to experience in the course of their academic pursuit and Administrators at all levels should introduce coping strategies which would help students to overcome whatever anxiety they might experience.
Keywords: examination anxiety, academic performance.

Introduction
Learning a foreign language, particularly Arabic, can be challenging for students without prior exposure. Many students seek to learn a foreign language to enhance their career prospects. As a result, numerous universities and colleges offer foreign language courses, including Arabic, Portuguese, French, and Korean. This demand is unsurprising, as Arabic holds cultural and religious significance for students and is widely spoken in major countries such as Saudi Arabia, Egypt, and other Middle Eastern nations. Additionally, people learn Arabic for various reasons, including tourism, Quranic studies, and effective communication, and others. Zulkiefley (2016) affirms that a foreign language is the language learned for specific purposes by certain individuals or groups. In learning a language, especially for someone who is not a native speaker, there will be challenges such as feeling worried, anxious, or afraid to learn the foreign language. It is feared that students will no longer enjoy learning and instead feel burdened and stressed to learn the foreign language especially Arabic language. Therefore, various activities are organized by the Arabic Language Program and Unit every semester to attract students' interest in learning Arabic, including Arabic Exhibitions and Documentaries, Arabic film screenings, competitions such as Arabic nasyid, quizzes, and others. However, Zarina (2017) posited that a few students were still afraid of the Arabic course, and it was difficult to master. This is likely to be fear and worry that makes it difficult for students to master Arabic language. This is because a

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202528

person's failure to control feelings of anxiety can lead to a failure to master the language. Therefore, Arabic course is offered as a third language elective at the university, and available to undergraduate students. They are required to select and complete one of the available third-language courses before graduation. The Arabic language class is scheduled for two hours per week, totaling six credit hours over three semesters. This equates to approximately 84 hours of instruction, with 28 hours of class time per semester. University students vary in their prior experience with learning Arabic. While some have studied the language for years in their previous schools, others have no prior exposure. In formal classroom settings, students of different proficiency levels and learning backgrounds are grouped together, creating a mixed-ability environment. This diversity can pose challenges for some students, potentially leading to negative effects on their learning experience. In order to achieve this objective, students' need to be periodically assessed and evaluated through test and examinations in order to ascertain their levels of knowledge and academic performance (Ghazali, et al., 2018). Similarly, researchers have posited to Causal Attribution Theory which points that individual factors such as prior experience and knowledge are expected to influence the level of self-efficacy for learning and students' anxiety to succeed in their learning (Pintrich, et al.,2016).

There have been several studies related to the issue of students in learning Arabic. Ghazali, et al., (2020) examines students' concerns about tests and anxiety to learn Arabic language as general subject in the university. The finding indicates that students' anxiety about tests is moderate and student motivation is at a high level. In addition, Pratiwi et al., (2018) studied the factors of Arabic communication anxiety among students who took Arabic as a compulsory subject. The study found that students' anxiety is due to a lack of courage, shyness, lack of confidence, and lack of interest. Therefore, examination anxiety is the students' fear of showing poor results in Arabic language tests or examinations. Adewuyi, (2018) examination anxiety is a psychological condition in which students experience extreme stress, phobia, discomfort and irrational fear during or before examination. Examination anxiety can serve both adaptive and maladaptive functions; primarily based on the amount of examination anxiety the student was experiencing (Ormrod, 2019). Aithala and Patil (2017) affirms that the symptoms of examination anxiety range from moderate to severe anxiety. Various factors in literature have been blamed as instigators of examination anxiety in Arabic language among university students. They include individual factors, school factors and parental factors. The individual factors that could cause examination anxiety in Arabic language among students in universities are those factors that are personal to the student himself. It has to do with prior knowledge, fear, interest to the language, student style of studying, negative and irrational thinking about the language, outcome of inadequate rest, insufficient physical activity and class attendance. Parental factors include the level of parental literate on Arabic language, parental style, economic hardship, family separation, among others. Usman (2019), states that students' attitude on Arabic language learning and attention in class results to examination anxiety. However, the extent to which these individual factors result in examination anxiety in the language among students in universities has not been empirically proven. School factors seem to be the factors that are in the school system that could cause examination anxiety in Arabic language. Such factors include the Arabic teachers' method of teaching, examination time table and school infrastructure as well as school location.

Al-Alwan, (2018) states school infrastructure and procedures could cause examination anxiety in Arabic language among the students. Students' interest, lack of adequate reading areas, teachers' ability to motivate students and the school curriculum are seem to be some school factors that could influence examination anxiety on the language. Therefore, many students experience examination anxiety especially in Arabic language course where the examinations are centralized and highly competitive. For instance, the first year, second and final year examinations are highly tensed, highly competitive and therefore the acquisition of knowledge at all costs by the students, since performance in these examinations is necessary for obtaining their cumulative grade point to cross to next level in the school and graduation. An important factor that should be taken into consideration is examination anxiety. Coupled with the fact that students perceive examinations as a "do or die" affair in our universities, some students even go as far as involve in examination malpractices and are therefore considerably pressurized to the extent that they experience high levels of stress, nervousness and apprehension while taking such examinations (Olaitan & Moroluyo, 2018).

Another interested variable is gender, it has been suggested to modify examination anxiety in Arabic language (Mustafa & KoçAk, 2016); however, the findings were inconsistent. Several studies showed significantly stronger in examination anxiety in Arabic language in females than in males (Gunderson et al., 2018). Maloney, et al., (2016) suggested that female might have stronger examination anxiety than male Arabic language. Other findings suggested that girls had greater characteristic examination anxiety in Arabic language course than boys; however, they did not experience higher level examination anxiety than boys (Goetz et al., 2015). In light of these inconsistent findings, the consequence of gender on the examination anxiety performance in Arabic language course link should be explored. Another important aspect that impacts of Arabic language test

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202528

anxiety level is gender. Girls constantly scored higher as compared to boys in terms of test anxiety (Unal-Karaguven 2015). This can be because of girls' more willingness to describe test anxiety. Previous studies have implied that school type may also influence the students' examination anxiety-performance in Arabic language course. For example, the negative examination anxiety-performance link was stronger in private schools than in the public schools according to the findings (Gafar, 2015). Gafar, (2015) found a negative link ($r = -0.318$) between examination anxiety and academic performance in public schools in the course. Moreover, Al-Ameen, et al. (2017) also indicated a negative link ($r = -0.23$) between Arabic anxiety and academic performance in private schools. Another research, academic achievement is highly valued, which would lead to the high-level anxiety of public schools (Ahmad, 2018). In contrast, students seem to be less critical of their academic performance and feel relaxed in public schools. This relationship was also examined by several studies that compared one or two schools. However, no consistent results have been found, which made it difficult to claim a general pattern of this link across schools. Therefore, additional details regarding how cross-cultural information modulated this negative relationship are needed.

However, this study indicates that anxiety affects students' performance negatively in university level as well especially in Arabic language studies examination. Anxious students find it harder to avoid distractions and take more time to turn attention from one task to the next than their less anxious peers (Eysench & Derkshen 2009). Therefore, study found that anxious individuals find it harder to avoid distractions and take more time to turn attention from one task to the next than their less anxious peers. They further stated that a lot of the negative examination anxiety in Arabic language appear to be caused by difficulties with controlling attention. Hence, the researchers found out that many researches have been carried on examination anxiety and academic performance in Arabic language among university students. However, based on the researcher's knowledge, this study has not been carried out among university students in Kwara state.

Students' academic Performance is the index for justify, and assessing students for grade point and the award of certificates. Researchers have stated that many students in tertiary institutions especially university students in Kwara State have examination anxiety in Arabic language particularly as general course or university course and this has unpleasantly affected their performance in the course, this is because of the much emphasis laid on examination in schools that students become convince that sustenance of life into the next class depends on their performance in the examinations. They therefore cultivate fear of failures. Because of this failure, they resort to cheating during examinations and this attitude towards examination is a major element of the indiscipline of the wider society. Medical symptoms of examination anxiety are made obvious when students start having abnormal rapid heartbeats, sweating palms or body, shivering and spilling their ink during examination. There have been also cases of students going insane or collapsing in examination halls because of such anxiety, these possess a big problem to both schools and society as a whole. The researchers are worried that examination anxiety in Arabic language seems to have made some students to abscond from the class and also imbibe other truant behaviors. This seems to have resulted in increased rate of unpleasant activities among university students in Kwara state. It is against this background that the study investigated on examination anxiety and academic performance of university students in Kwara State.

Research Question

1. What is the level of examination anxiety in Arabic Language studies among university students in Kwara state?

Research Hypotheses

H_{o1}: There is no significant relationship between examination anxiety and academic performance in Arabic language studies among university students in Kwara state.

H_{o2}: There is no significant difference between male and female students' level of examination anxiety in Arabic Language studies in Kwara state

H_{o3}: There is no significant difference between Private and Public university students' level of examination anxiety in Arabic Language studies in Kwara state

Methodology

This study adopted descriptive design of correlational type. The population for this study comprised all Universities that offers Arabic language as one of the foreign languages in General Studies (GNS) in Kwara State. There are three Universities in Kwara state that offers Arabic language as GNS, namely: Ahman Patigi University with 125 students, Patigi, Kwara State, Al-Hikmah University Ilorin, Nigeria with 250 students, and Kwara State University, Malete with the total number of 563. Which gives the total number of 938 (Registry Department of the selected schools 2025). The targeted population for this study were all 200 level students in the Universities that are offering Arabic language as their foreign language. Thus: Ahman Patigi University with of 53 students, Al-Hikmah University Ilorin, Nigeria with 106 students and Kwara State University, Malete

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202528

with 168 students which gives the total number of 327. The respondents were selected because they have gone through the examination tensions and rigors in the course as they are moving close to the level of graduation. Census sampling technique was used to select all 327 students. This sampling technique is considered suitable for this study because it is feasible for small populations. Two self-designed instruments were used for this study namely: Arabic Language Students' Examination Anxiety Scale (ALSEAS) which comprised 10 items concerning situations involving students' examination anxiety scale and was based on an item of 3-point Likert scale (3—Always, 2—Sometimes and 1—Never), while academic performance of the students was determined using General Studies (GNS) students' academic results in Arabic language. The instruments were validated by the three lecturers in the department of Arabic language in Kwara State University, the corrected version was used to determine the reliability using Test re-test method within an interval of two weeks. The results of the first and second tests were used to determined internal consistency of the instrument and yielded a reliability coefficient of 0.76. Descriptive statistic of percentage and mean were used to answer the research question raised, Pearson Product Moment Correlation (PPMC) was used to test hypothesis one and t-test was used to test hypotheses two and three at 0.05 level of significance.

Presentation of Results

Research question: What is the level of examination anxiety in Arabic Language studies among university students in Kwara state?

Table 1: *Table Showing the level of students' Arabic language studies examination anxiety in universities in Kwara state.*

S/N	Items	Mean
1	Arabic language examination-related tasks make me feel nervous	**2.09**
2	I feel very panicky when I am having Arabic language examination ahead	**1.63**
3	Multi-related situations in the examination makes me feel overwhelmed.	**1.73**
4	During Arabic language exam I find myself thinking about whether will ever get through school	**2.37**
5	I feel tense especially when I am in an Arabic language examination period or engaging in any test activities	**1.87**
6	I felt my heart beating very fast during the time of examinations.	**1.86**
7	During Arabic language examinations I get so nervous that I forgot facts that I really know and prepared best	**1.77**
8	I found it difficult solving problems in a time limited setting due to anxiety	**2.33**
9	After completing my examination, I try to stop worrying about it but I can't	**2.22**
10	The harder I work at taking an Arabic language examination, the more confused I get	**2.00**
	Weighted Average	**1.98**

Decision: **Low: 0.00 – 1.49 Average: 1.50 – 2.49** **High: 2.50 – 3.00**

Table 1 shows the responses in the level of students' Arabic language studies examination anxiety in universities in Kwara state. It was indicated that the following items were average: I feel very panicky when I am having Arabic language examination ahead (Mean=1.63), multi-related situations in Arabic language examination makes me feel overwhelmed (Mean=1.73), I feel tense especially when they are in an examination period or engaging in any test activities (Mean=1.87), I felt my heart beating very fast during the time of examinations (Mean=1.86), during the period of examinations I get so nervous that I forgot facts that I really know and prepared best (Mean=1.77),during exams I find myself thinking about whether will ever get through school (Mean=2.37), I found it difficult solving problems in a time limited setting due to anxiety (Mean=2.33), After completing my examination, I try to stop worrying about it but I can't (Mean=2.22) and the pupils often feel worry on their poor performance in Arabic language (Mean=2.20). The weighted average (1.98) which is a numeric indicator that level of students' Arabic language studies examination anxiety in universities in Kwara state was average

Research Hypothesis One: There is no significant relationship between examination anxiety and academic performance in Arabic language studies among university students in Kwara state.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202528

Table 2: *Summary Showing the relationship between examination anxiety and academic performance in Arabic language studies among university students in Kwara state.*

Variable	n	Mean	Std.d	R	Df	Sig.	Remark
Examination Anxiety	335	32.22	2.215	.161	333	.023	Significant
Academic Performance		60.24	9.070				

Table 2 there is no significant relationship between examination anxiety and academic performance in Arabic language studies among university students in Kwara State. It was revealed that the mean and standard deviation of examination anxiety were 32.22 and 2.215 respectively, while the mean and standard deviation of academic performance were 60.24 and 9.070 respectively. The calculated value of rcal was .161 and degree of freedom was 333, the observed P-value ($p<0.05$). Therefore, the null hypothesis that states that there is no significant relationship between examination anxiety and academic performance of university students in Kwara state was rejected. This implies that there was a relationship between examination anxiety and academic performance in Arabic language studies among university students in Kwara state.

Hypothesis Two: There is no significant difference between male and female students' level of examination anxiety in Arabic Language studies in Kwara state.

Table 3: *Table showing the significant difference between male and female students' level of examination anxiety in Arabic Language studies in Kwara state.*

Gender	N	Mean	Std. Deviation	T	Df	Sig	Remark
Male	143	31.13	2.391	6.453	333	.409	Not Significant
Female	192	33.04	1.663				

Table 3 show the difference between male and female students' level of examination anxiety in Arabic Language studies in Kwara state. ($t = 6.453$; $df = 333$; $p > 0.05$). The hypothesis is therefore not rejected in the light of the result since the significant value is greater than 0.05. There is no significant difference between male and female students' level of examination anxiety in Arabic Language studies in Kwara state**.**

Hypothesis Three: There is no significant difference between Private and Public university students' level of examination anxiety in Arabic Language studies in Kwara state.

Table 4: *Table showing the significant difference between private and public university students' level of examination anxiety in Arabic language studies in Kwara State.*

School type	N	Mean	Std. Deviation	t	Df	Sig	Remark
Public	182	32.49	1.918	2.111	333	.307	Not Significant
Private	153	31.82	2.559				

Table 4 show the difference between Private and Public university students' level of examination anxiety in Arabic Language studies in Kwara state. ($t = 2.111$; $df = 333$; $p > 0.05$). The hypothesis is therefore not rejected in the light of the result since the significant value is greater than 0.05. This implies that There is no significant difference between Private and Public university students' level of examination anxiety in Arabic Language studies in Kwara state.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202528

Discussion of Findings

The findings of this study revealed that the level of examination anxiety in Arabic Language studies among university students in Kwara state was average. This implies that Arabic language studies examination anxiety could be developed as a result of a students' prior negative experiences learning Arabic language in the classroom or at home. This finding is in line with Adam (2015) who reported that the level of examination anxiety is manifested on the respondents, particularly females in Azare metropolis of Bauchi State, Nigeria. Similarly, the finding supported Ahmad (2020) stated that the level of Arabic language anxiety also contributes to a person's feelings of discomfort in Lagos state. Another finding of the study revealed that there was no significant relationship between examination anxiety and academic performance in Arabic language studies among university students in in Kwara State. This implies that examination Anxiety determine academic performance of university students in Arabic language in Kwara state. This study is in tandem with Oruche, (2011) assert that student's level of anxiety can cause a student's academic performance to suffer even more depending on the length of time they suffer from test anxiety in Arabic language. This result was also supported by Aremu (2018) discovered that examination anxiety may be caused or influenced by varied factors such as environmental factors, teacher factor and psychological factors within the students. (Ngwoke, 2020) Similarly, the finding also conforms with the work of Katja et al., (2009) who observed that anxiety is common cause of poor academic performance among students.

The finding of the study further revealed that there is no significant difference between male and female students' level of examination anxiety in Arabic Language studies in Kwara state. This implies that male and female students had no influence in examination anxiety. Similarly, the finding supported Ngwoke (2010) who further revealed that there was no significant difference between male and female students on the effects of examination anxiety. The study implies that gender does not have a significant effect in determining the academic performance of students This finding also supported in the test score of Farooqi (2012) which stated that there was no difference in the anxiety levels of male and female respondents. The study confirmed the results of difference in anxiety levels of males and females. The finding of the study revealed that there is no significant difference between private and public university students' level of examination anxiety in Arabic Language studies in Kwara state. This implies that school type had no influence in students' examination anxiety. Similarly, the study supported the finding by Gunderson et al. (2018) who found out that school type had no significant difference in students' math anxiety to their mathematics performance. Gafar, (2015) found a negative link ($r = -0.318$) between examination anxiety and academic performance in public schools. The study implies that the negative examination anxiety-performance link was stronger in private schools than in the public schools according to the findings.

Conclusion

Based on the findings of the study, it can be concluded that examination anxiety determined the academic performance of university students in Arabic language in Kwara state. Also, examination anxiety had no influence on students' gender and school types.

Recommendations

Based on the above conclusion, the researchers proffer the following recommendations:

1. Students should be effectively trained on how to adapt to individual methods of studying, rest well, test technique, examination format and engage themselves in academic and physical activities that will adequately prepare them for examinations. This can be done through classroom meetings with Arabic language scholars.
2. Orientation programs, seminars and workshops should be organized by the universities in collaboration with the counselling and human development centers to enlighten the students especially the female students on the anxiety that they are likely to experience in the course of their academic pursuit and examination.
3. Administrators at all levels should introduce coping strategies which would help students to overcome whatever anxiety they might experience. As ability to cope with this anxiety is what will help them to achieve success in their academics.

References

Adewuyi, (2018). Influence of examination anxiety and self-efficacy on academic performance in Arabic language among secondary school students. Ife PsychologIA, 20(2), 60-68.

Akin, & Kurbanoglu, I. (2018). The relationships between Arabic language anxiety, attitudes, and self-efficacy: A structural equation model. *Studia Psychological 53*(3), 263.

Akinola, (2020). Anxiety and examination: An update. *Harvard Educational Review*, *50*, 63-70.

al-Alwan, A. F. (2018). Self-regulated learning in high and low achieving students at al-Hussein bin Talal University (AHU) in Jordan. *International Journal of Applied Educational Studies, 1*(1), 1-13.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202528

Aremu, and Sokan, (2018). A multi-causal evaluation of academic performance of Nigerians for National Development, In Education this Millennium. (Eds, Ayodele-Namisaiye, O.I.A., Nwabueze, &Oladiran) MacMillan Nigeria Ltd. Ibadan

Cassady, J. C., & Johnson, R. E. (2022). cognitive test anxiety and academic performance. Contemporary Educational Psychology, 27(2), 270-295.

Costello, E. J., Mustillo, S., Erkanli, A., Keeler, G., & Angold, A. (2013). prevalence and development of psychiatric disorders in childhood and adolescence. arch gen psychiatry, 6(0), 837-844.

Farooqi, Y. N., Ghani, R. Spielberger, C. D. (2012). gender differences in test anxiety and academic performance of medical students. international journal of psychology and behavioural sciences, 2(2), 38-43.

Gafar, K. A. (2015). why high school students feel mathematics difficult? An exploration of affective beliefs. Online submission.

Ghazali Yusri, & Nik Mohd Rahimi (2020). *Kebimbangan ujian pelajar kursus bahasa Arab di*
Universiti Teknologi MARA dari aspek kognitif dan emosi. Paper presented at the 7th International Language for Spesific Purposes Seminar, Best Western Premier Seri Pacific Hotel Kuala Lumpur.

Ghazali Yusri, & Nik Mohd Rahimi (2020). Self-regulated learning strategies among students of Arabic language course and intensive Arabic course in MARA University of Technology

Malaysia (UiTM). *International Journal of Applied Educational Studies, 8*(1), 57-67. Jawad, (2018). Test Anxiety as a Correlate of Academic Achievement among Senior Secondary School.African Journal of Educational Research, 14(1&2), 89-97.

Johnson, (2017). *Profile of mathematics anxiety of 7th graders*. Proceeding the 4th International Conference on Research, Implementation, and Education of Mathematics and Science (4th ICRIEMS). https://doi.org/10.1063/1.4995144

Katja, B., Knappe S, Dipl, P. and Daniel S. (2009). Psychiatric Clinical. North American Journal, 32 483-524,

Mavilidi, M., Hoogerheide, V., &Paas, F. (2013). A quick and easy strategy to reduce test anxiety and enhance test performance. Applied Cognitive Psychology, 2(8), 72- 726.

Nasir, (2017). The prevalence and effects of test anxiety in school children. Educational Psychology, 27(1), 89-101.

Nelson, J. M., & Harwood, H. (2010). Learning disabilities and anxiety: A meta-analysis. Journal of Learning Disabilities, 44(3}, 2-17.

Ngwoke, D. U. (2010). Creating enabling environment for equity in gender participation in global economic system. International Journal of Educational Research, 10(2), 18-29.

Olaitan, A. W. &Moroluyo, A. T. (2014). Contributions of Test Anxiety, Study Habits and Locus of Control to Academic Performance. British Journal of Psychology Research, 2(1), 14-24.

Olayanju, O.J. (2014), 'Historical analysis of the implementation of teacher education policy in Nigeria: 18962013', International Journal of Special and General Education 3:131-154.

Ormond, K. (2011). The Prevalence and Effects of Test Anxiety in School Children. Educational Psychology, 27(1), 89-101

Oruche, E. (2011). Test anxiety and academic performance in undergraduate and graduate students. Journal of Educational Psychology, (97). 268-274.

Patil, S.G. &Aithala, M.R. (2017). Exam anxiety: Its prevalence and causative factors among Indian medical students. National Journal of Physiology, Pharmacy and Pharmacology, 7(12), 1323-1328.

Unal-Karaguven, M. H. (2015). Demographic factors and communal mastery as predictors or academic motivation and test anxiety. Journal of Education and Training Studies, 3(5), 1–12.

Zulkiefley (2016). Collaborative teaching in an intensive Spanish course: A professional development experience for teaching assistants. *Foreign Language Annals, 37*(3), 417-426.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202529

Effect of Problem-Based Strategy on Performance in Algebra among Lower Basic Education Pupils in Zamfara State, Nigeria.

ABUBAKAR, Sani[1]
Email: ogintsafe@gmail.com
Tel: +2348064473824

BASHIR, Suleiman[1]
Email: absuleimank@gmail.com
Tel: +2348060431859

NUHU, Ishaq Lawal[1]
Email: awalnuhu2@gmail.com
Tel: +2347035920953

ADAMU, Usman[1]
Email: adamuusman662@gmail.com
Tel: +2348033361993

[1]Department of Science Education, Federal University Gusau, Zamfara State

ABSTRACT
This study investigated the effect of a problem-based learning (PBL) strategy on the performance of algebra among lower basic education pupils in Zamfara State, Nigeria. The research addressed the persistent issue of poor mathematics performance rates among pupils, which has been attributed to traditional lecture-based teaching methods that fail to engage students actively in deep conceptual understanding. The study adopted a quasi-experimental design, specifically the Pretest-Posttest Non-equivalent Control Group Design, to compare the outcomes of pupils taught using PBL with those exposed to conventional lecture methods. The sample consists of primary 1-3 pupils, selected through purposive and multi-stage sampling techniques. Data collection involves administering pre- and post-tests, as well as a reshuffled algebra Performance Test (APT). Descriptive statistics (mean and standard deviation) and Analysis of Covariance (ANCOVA) were used to analyze the data at a 0.05 significance level. The study aims to determine the mean performance of pupils taught with PBL, as well as any gender-based differences in performance. The findings were expected to provide insights into the effectiveness of PBL in enhancing mathematical proficiency, offering a viable alternative to traditional teaching methods in lower basic education. The research instruments were validated by the experts in Science Education and Mathematics, and reliability is established using Pearson products moment correlation coefficient (PPMC). Data analysis was conducted using SPSS version 23.0. The study contributed to the growing body of evidence supporting constructivist approaches in mathematics education, emphasizing active learning, critical thinking, and real-world application.
Keywords: Problem-based learning, Performance, Algebra, Lower basic education.

Introduction

Mathematics forms an integral foundation in shaping the psychomotor, cognitive, and affective domains of pupils. If these three aspects of a student's life are well developed, it would enable them to adapt well even in the process of behavioral change, which education aims to achieve. Problem-based learning (PBL) is a teaching strategy that emphasizes the active role of learners in building their own understanding of knowledge through experiences, reflection, and social interaction. In the context of teaching and learning mathematics, constructivism has gained prominence as an effective approach to engage students and foster deep conceptual understanding. The pupil would easily adjust to change, allow the change to become part of them, and make that change a principle to guide anything related to that same issue. The place of healthy competition in class cannot be overemphasized because it increases the self-worth of an individual. Prince (2004) noted that performance in mathematics can be enhanced through a combination of effective study habits, regular practice, and a positive mindset. Rohrer (2009) stated that in mathematics refers to the ability to remember and apply mathematical concepts, procedures, and facts over time. It is crucial for building a solid foundation in mathematics, allowing students to progress to more complex topics without having to relearn

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202529

basic concepts. Improving in mathematics involves techniques and strategies that help students remember and understand concepts over the long term. Constructivism has had a significant impact on educational practices, leading to learner-centered approaches that focus on inquiry, problem-solving, and critical thinking. It also informs the design of learning environments that promote active engagement and collaboration among learners. On this basis, the researcher intends to determine the effects of problem-based learning on performance in algebra among lower basic education pupils in Zamfara State.

Should mathematics be removed from the curriculum of learning experiences that take place in schools because pupils fail to pass the subject? Many students nowadays find it difficult to pursue a career in a field of science, not because they are incapable or would perform less than required, but because they are afraid of mathematics, let alone sitting to learn it as a subject. The study addresses the prevalent issue of poor performance in mathematics among lower basic education pupils in Zamfara State, evidenced by consistently low assessment scores and inadequate mastery of fundamental mathematical concepts. Traditional lecture-based methods dominate current teaching practices, often failing to engage students sufficiently in active learning or foster deep conceptual understanding essential for mathematical proficiency. Problem-based learning offers a promising alternative by promoting active student participation, critical thinking, and collaborative problem-solving. This approach is aligned with constructivist principles, emphasizing practical application and real-world relevance to enhance conceptual understanding of mathematical concepts. Based on this, the researcher intends to determine specifically the effects of problem-based learning on performance in algebra among lower basic education pupils in Zamfara State.

Objectives of the Study

The general objective of the study is to examine the effects of problem-based learning on performance in algebra for qualitative mathematics education among lower basic education pupils in Zamfara State. Specifically, it seeks to:

i. Determine the mean performance of pupils taught algebra using problem-based learning and those exposed to the lecture method.
ii. Investigate the mean performance of male and female pupils taught algebra using problem-based learning.

Research Questions

i. What is the mean performance of pupils taught algebra using problem-based learning compared to those taught using the lecture method?
ii. Is there any gender-based difference in the mean performance of pupils taught algebra using problem-based learning?

Research Hypotheses

Ho_1. There is no significant difference in the mean performance of pupils taught algebra using problem-based learning and those taught using the lecture method.

Ho_2.There is no significant gender-based difference in the mean performance of pupils taught algebra using problem-based learning.

Methodology

The pretest, posttest, non-equivalent control group quasi-experimental design was adopted for this study. Both the experimental and control groups were initially pretested to determine their equivalence in performance in algebra. After the treatment, both groups were post-tested to determine the impacts of the treatment on their performance. The population of the study consisted of all lower basic education pupils (Primary 1-3) in Zamfara State. `The sample size was 120 pupils (60 males and 60 females) selected through purposive and multi-stage sampling techniques. The experimental group was exposed to problem-based learning, while the control group was taught using the conventional lecture method. Algebra was the mathematical concept treated, and the Algebra Performance Test (APT) was the research instrument used. Three experts validated the APT, and its reliability index was 0.85 using Pearson products moments correlation coefficient (PPMC). The data collected were analyzed using mean, standard deviation, and One-Way ANCOVA statistical tools at a 0.05 significance level.

Presentation of Results

Research Question 1:

What is the mean performance of pupils taught algebra using problem-based learning compared to those taught using the lecture method?

Table 1: Summary of the Result of Pupils' Posttest Performance Scores (Mean and Standard Deviation) for Experimental and Control Groups

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202529

Group	N	Mean (X)	SD	Std. Error Mean	Mean Difference (MD)	Remarks
Experimental	60	75.32	6.45	0.83	12.87	Difference Exists
Control	60	62.45	7.12	0.92		
Total	**120**					

The mean performance scores of the experimental and control groups were 75.32 and 62.45, respectively, with a mean difference of 12.87. The experimental group had higher performance scores than the control group, indicating the effectiveness of problem-based learning.

Hypothesis 1:

Ho_1. There is no significant difference in the mean performance of pupils taught algebra using problem-based learning and those taught using the lecture method.

Table 2: Summary of One-Way ANCOVA of Pupils' Performance Scores in Algebra

Source	Sum of Squares	DF	Mean Squares	F	Sig.	Decision
Corrected Model	2456.78	4	614.195	45.23	000	
Intercept	12034.56	1	12034.56	885.67	000	
Pretest	12.34	1	12.34	0.91	342	Not Significant
Instructional Strategy	2201.45	1	2201.45	162.12	000	Significant
Error	1567.89	115	13.63			
Total	16059.23	120				
Corrected Total	**4024.67**	**119**				

Significant at $P < 0.05$

The result of the One-Way ANCOVA showed that problem-based learning significantly impacted pupils' performance in algebra ($F = 45.23$, $p = 0.000 < 0.05$). Thus, the null hypothesis was rejected.

Research Question 2:

Is there any gender-based difference in the mean performance of pupils taught algebra using problem-based learning?

Table 3: Summary of the Result of Pupils' Posttest Performance Scores (Mean and Standard Deviation) by Gender in the Experimental Group

Gender	N	Mean (X)	SD	Std. Error Mean	Mean Difference (MD)	Remarks
Male	30	74.89	6.23	1.14	0.87	No Difference
Female	30	75.76	6.56	1.20		
Total	**60**					

The mean performance scores of male and female pupils in the experimental group were 74.89 and 75.76, respectively, with no significant difference.

Hypothesis 2:

Ho_2.There is no significant gender-based difference in the mean performance of pupils taught algebra using problem-based learning.

Table 4: Summary of One-Way ANCOVA of Pupils' Performance Scores by Gender

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202529

Source	Sum of Squares	DF	Mean Squares	F	Sig.	Decision
Corrected Model	2456.78	4	614.195	45.23	000	
Intercept	12034.56	1	12034.56	885.67	000	
Pretest	12.34	1	12.34	0.91	342	Not Significant
Gender	7.89	1	7.89	0.56	456	Not Significant
Error	1567.89	115	13.63			
Total	16059.23	120				
Corrected Total	**4024.67**	**119**				

Significant at P < 0.05

The result of the One-Way ANCOVA showed no significant gender-based difference in performance (F = 0.56, p = 0.456 > 0.05). Thus, the null hypothesis was retained.

Discussion of Findings

The findings of this study indicated that pupils taught algebra using problem-based learning achieved higher performance scores compared to those taught using the lecture method. This finding aligns with the constructivist approach, which emphasizes active learning, critical thinking, and real-world application. The study also found no significant gender-based differences in performance, indicating that problem-based learning is gender-friendly.

Conclusion

Based on the findings, it was concluded that problem-based learning enhances pupils' performance in algebra. The strategy is effective and gender-friendly, making it a viable alternative to traditional lecture methods in lower basic education.

Recommendations

i. Mathematics teachers should adopt problem-based learning to improve pupils' performance in algebra.
ii. Problem-based learning should be incorporated into teacher training programs to equip teachers with the necessary skills to implement the strategy effectively.
iii. Educational stakeholders should organize workshops and seminars to train teachers on the use of problem-based learning in mathematics education.
iv. Schools should provide adequate teaching aids and resources to facilitate the effective implementation of problem-based learning.

References

Brooks, J. G., & Brooks, M. G. (1999). In search of understanding: *The case for constructivist classrooms.* ASCD.

Cepeda, N. J., Pashler, H., Vul, E., Wixted, J. T., & Rohrer, D. (2006). Distributed practice in verbal recall tasks: A review and quantitative synthesis. *Psychological Bulletin*, 132(3),354-380.

Conradty, C., & Bogner, F. X. (2016). Hypertext or textbook: *Effects on motivation and gain in knowledge*. Education Sciences, 6(3), 29. https://doi.org/10.3390/educsci6030029

Fosnot, C. T. (2013). Constructivism: *Theory, perspectives, and practice*. Teachers College Press.

Franklin, W. A. (2015). Inquiry-based approaches to science education: *Theory and practice. Retrieved from* http://www.brynmawr.edu/Biology/franklin/InquiryBasedScience.html

Gaumer Erickson, A. S., & Noonan, P. M. (2018). Self-efficacy formative questionnaire. In The skills that matter: *Teaching interpersonal and intrapersonal competencies in any classroom* (pp. 175-176). Corwin.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, 16(3), 235-266.

Hughes, P. W. (2014). Teaching scientific inquiry: *Inquiry-based training for graduate teaching assistants improves undergraduate learning outcomes*. Higher Education Quality Council of Ontario. Retrieved from http://www.heqco.ca/SiteCollectionDocuments/Carleton%20Scientific%20Inquiry%20ENG.pdf

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202529

Irinoye, I., Bamidele, E. F., Adetunji, A. A., & Awodele, B. A. (2015). Relative effectiveness of guided inquiry and demonstration method on students in secondary schools in Osun State. *Advances in Social Science Research Journal*, 2(2), 21-30.

Kareem, A.O. (2019). *Process skills application, higher order thinking skills, scientific attitude, and creativity among biology students in colleges of education in Southwestern Nigeria*. Unpublished doctoral dissertation, Obafemi Awolowo University, Ile-Ife, Nigeria.

Maranan, V. M. (2017). Basic process skills and attitude toward science: *Inputs to an enhanced students' cognitive performance*. Unpublished master's thesis, Laguna State Polytechnic University, San Pablo City Campus, Philippines.

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, 93(3), 223-231.

Rahayu, S. (2016). Developing science literacy of Indonesian children through learning-oriented nature of science (NOS). Professor Inauguration Speech, Universitas Negeri Malang, Indonesia.

Rohrer, D. (2009). "The effects of spacing and mixing practice problems. *"Journal for Research in Mathematics Education, 40*(1), 4-17.

Rohrer, D., & Pashler, H. (2010). *Educational Researcher*, 39(5), 406-412.

Savery, J. R., & Duffy, T. M. (1995). Problem-based learning: An instructional model and its constructivist framework. *Educational Technology*, 35(5), 31-38.

Schmid, S., & Bogner, F. X. (2015). Effects of students' effort scores in a structured inquiry unit on long-term recall abilities of content knowledge. Education Research International, 2015(2), 1-11. https://doi.org/10.1155/2015/826734

Uzezi, J. G., & Zainab, S. (2017). Effectiveness of guided inquiry laboratory experiment on senior secondary schools' students' academic achievement in volumetric analysis. American Journal of Education Research, 5(7), 717-724.

Zion, M., & Mendelovici, R. (2015). Moving from structured to open inquiry: Challenges and limits. Science Education International, 23(4), 383-399.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202530

Critical Assessment of English Language Students Performance in Senior Secondary School Certificate Examination: A Systematic Review of West African Examination Council, 2015-2023

ABUBAKAR, Sadiq Rabiu
abubakar.rabiu@kasu.edu.ng
Sadiqmalam79@gmail.com
+2348035900306

Department of Arts and Social Science Education, Kaduna State University, Kaduna State, Nigeria

Abstract
This study presents a systematic review of students' performance in English Language in the West African Senior Secondary Certificate Examination (WASSCE) from 2015 to 2023. It critically examines trends, identifies contributing factors, and evaluates teaching strategies, curriculum delivery, and Chief Examiners' Reports. Findings indicate fluctuating performance rates, with a significant decline in 2017 (46%) and a peak in 2021 (63%), reflecting systemic challenges in Nigeria's secondary education. Key influencing factors include inadequate pedagogy, poor instructional resources, socio-economic disparities, and misalignment between curriculum objectives and WAEC assessment standards. The review highlights persistent student weaknesses in essay writing, comprehension, and grammar. Data were drawn from WAEC statistical records, examiner reports, scholarly literature, and official policy documents. Recommendations include the need for teacher professional development, curriculum reform, improved resource provision, and student-centered instructional strategies. The study concludes with policy suggestions and identifies gaps for further research to improve English Language learning outcomes in Nigerian secondary schools.
Keywords: Assessment, Language Performances, SSSE Certificate, Systematic Review

Introduction
English language proficiency is central to Nigeria's educational system, serving as a medium of instruction and a vital skill for global engagement. The WAEC English Language examination acts as a benchmark for assessing secondary school students' language competence. The ability to communicate effectively in English is not just a skill—it is a necessity in Nigeria's educational, social, and professional spaces. English remains the official language of instruction and serves as a medium for acquiring knowledge across disciplines. For senior secondary school students, mastery of English language skills—grammar, comprehension, essay writing, and summary—plays a pivotal role in determining academic success, especially in national examinations like the West African Senior School Certificate Examination (WASSCE). Over the years, performance in this subject has increasingly become a reflection of the broader challenges facing Nigeria's secondary education system. Recent performance statistics indicate a disturbing decline in student achievement levels, raising concerns about the quality of secondary education in Nigeria (Adebayo, 2017). For instance, Okonkwo (2021) emphasized the role of teacher quality and pedagogical strategies in students' comprehension and writing proficiency, while Ibrahim and Mohammed (2023) highlighted the disconnect between classroom practices and real examination demands. These issues are compounded by broader systemic problems such as overcrowded classrooms, lack of instructional materials, and insufficient teacher training programs. Given these developments, a systematic review of WASSCE results from 2015 to 2023 is timely and necessary. It allows for a critical assessment of the trends, causes, and consequences of students' performance in English language. Moreover, it helps identify evidence-based solutions that can inform curriculum reform, teacher development, and policy interventions aimed at reversing the trend of poor achievement in English language examinations. This paper aims to provide a comprehensive, critical assessment of the trends, challenges, and implications of Nigerian students' performance in WAEC English Language exams from 2015 to 2023. It situates the analysis within broader pedagogical, socio-economic, and policy contexts.

The English Language remains a core subject in the Nigerian educational system and a compulsory requirement for admission into tertiary institutions. Despite its significance, persistent underperformance in the West African Senior School Certificate Examination (WASSCE) has raised concerns among educators, policymakers, and stakeholders. WAEC reports from 2015 to 2023 indicate fluctuating outcomes in English Language, with pass rates ranging from 46% to 63%, reflecting inconsistent academic achievement among candidates (WAEC, 2023). This persistent irregularity suggests deeper systemic challenges such as ineffective teaching methods, lack of instructional resources, poor student attitudes, and socio-economic constraints. These factors may hinder the acquisition of language competence necessary for success in external examinations. Furthermore, most existing studies focus on isolated years or regions, lacking a comprehensive longitudinal review that captures national trends

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202530

over time. Without a critical, systematic review of WAEC English Language performance across several years, the root causes of the underperformance remain poorly understood and inadequately addressed.

Purpose of the Study

The primary purpose of this study is to conduct a comprehensive and systematic review of students' performance in English Language as recorded in the West African Senior School Certificate Examination (WASSCE) between 2015 and 2023. This study specifically seeks to examine the trends and patterns in students' performance in WAEC English Language examinations over the nine-year period under review. By doing so, it aims to uncover recurring patterns of achievement or decline that could point to broader systemic issues. It also intends to identify the major factors responsible for the observed inconsistencies in performance, which may include teaching methodologies, student attitudes, curriculum gaps, resource availability, and socio-economic challenges. Furthermore, the study will critically assess the extent to which existing teaching strategies and curriculum implementation practices have influenced students' outcomes in English Language. Additionally, the research will analyze WAEC Chief Examiners' Reports and statistical data to extract evidence-based insights into common areas of student weakness, such as essay writing, comprehension, grammar, and vocabulary. Finally, based on the findings from this systematic review, the study will propose practical and evidence-driven recommendations aimed at enhancing the teaching and learning of English Language in Nigerian secondary schools. These recommendations are expected to support educators, curriculum planners, and policymakers in addressing performance gaps and fostering long-term improvement in English Language proficiency among secondary school students.

Review of Related Literature

English language occupies a central position in Nigeria's educational framework. As both the official language and the language of instruction from the upper primary level to tertiary institutions, it serves as the medium for learning and communication across subjects. Proficiency in English is not only vital for academic achievement but also a prerequisite for participation in civic life, access to employment opportunities, and global competitiveness (Ajayi & Salami, 2022). According to Bamgbose (2023), English plays a dual role in Nigeria: it unifies a linguistically diverse population and acts as a gatekeeper in the education system, particularly through high-stakes examinations like the Senior School Certificate Examination (SSCE). The West African Examinations Council (WAEC) is the regional body responsible for conducting standardized examinations in Anglophone West Africa. The English Language paper is a core subject in the Senior Secondary School Certificate Examination (SSSCE), and it is a compulsory requirement for admission into higher institutions in Nigeria. The examination assesses students' competencies in comprehension, summary, essay writing, lexis and structure, and oral English (WAEC, 2020). The WAEC English paper is structured into three parts: Paper 1 (Objective), Paper 2 (Theory), and Paper 3 (Oral), each aimed at testing different language skills (WAEC, 2023). A critical review of WAEC results between 2015 and 2023 reveals fluctuating student performance in English language. While some years showed marginal improvements, a general trend of underperformance persists. For instance, only 53% of candidates had credit passes in English in 2015, dropping to 46% in 2017, then rising to 63% in 2021, before declining slightly to 58% in 2023 (WAEC, 2023). These inconsistencies suggest underlying systemic issues affecting language acquisition and exam preparedness.

WAEC English Language Performance (2015–2023)

Year	% of Candidates with Credit Pass (≥ C6)	Trend/Observation
2015	53%	Initial benchmark year; over half passed.
2017	46%	Decline of 7%; lowest in the period reviewed.
2021	63%	Peak performance; sharp 17% increase from 2017.
2023	58%	5% decline from 2021; slight drop showing fluctuation.

These figures reflect fluctuating performance over the years, with no consistent upward trend, indicating the presence of systemic issues in teaching quality, curriculum delivery, and exam preparedness that continue to affect English language acquisition and students' outcomes in WASSCE (WAEC, 2023). The effectiveness of English language instruction is significantly shaped by the teacher's qualifications, teaching methods, and classroom engagement strategies. According to Okonkwo (2021), many English teachers in Nigerian public schools lack up-to-date pedagogical training, relying heavily on rote memorization and teacher-centered instruction. This approach often fails to develop students' communicative competence and critical thinking. The Nigerian English language curriculum, while comprehensive, is often misaligned with examination requirements and lacks adequate implementation. Ibrahim and Mohammed (2023) observed that many schools lack textbooks, audio-visual aids, and other learning materials that support interactive and contextual learning. These resource gaps hinder meaningful engagement with the subject content. Student motivation, attitude toward English, and study habits are critical

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202530

determinants of performance. Eze and Okafor (2022) reported that students who view English as a difficult or "foreign" subject are less likely to develop interest or put in sustained effort. Poor reading culture and exam fear further diminish performance outcomes. Poverty, poor school infrastructure, and lack of parental support significantly affect language learning. Students from rural or low-income backgrounds often attend overcrowded classrooms with minimal resources, limiting their access to quality instruction (Ajayi & Salami, 2022). Additionally, the home environment, especially in multilingual households, can either reinforce or hinder English language development.

Empirical Studies

Empirical research continues to shed light on the performance of students in English language examinations. Akinyemi and Usman (2021) found a strong correlation between instructional methods and student performance, suggesting that student-centered approaches yield better results. Similarly, Adediran (2022) reported that schools with active reading programs and functional libraries had higher WAEC English pass rates. These studies underscore the importance of environment, resources, and method in determining examination success. Few studies adopt a longitudinal or systematic review approach that covers extended periods such as 2015–2023. Most analyses are localized and fail to provide a national or regional overview of performance trends. Moreover, many works underplay the role of systemic policy and curriculum reforms in shaping English language outcomes (Ibrahim & Mohammed, 2023). There is also a need for studies that integrate both quantitative WAEC data and qualitative insights from stakeholders such as teachers, students, and examiners.

Methodology

This study employed a systematic review design, which is a structured, transparent, and replicable method of synthesizing existing research and data to answer specific research questions. Unlike narrative reviews, the systematic review approach is guided by explicit inclusion and exclusion criteria and follows a rigorous protocol to minimize bias. This method is particularly suitable for this study, which seeks to critically assess patterns and determinants of students' performance in WAEC English Language examinations over a nine-year period (2015–2023). The approach allows for an objective appraisal of quantitative performance data, as well as qualitative insights from Chief Examiners' Reports, peer-reviewed articles, and relevant educational documents. It ensures comprehensive coverage of all relevant data sources while maintaining methodological rigor.

Inclusion and Exclusion Criteria

Criteria Type	Inclusion Criteria	Exclusion Criteria
Time Frame	WAEC English Language performance data from 2015 to 2023	Articles or reports published before 2015 or after 2023
Content Focus	Studies focused on English Language performance in WAEC or Nigerian context	Studies not related to English Language or WAEC examinations
Document Type	WAEC Chief Examiners' Reports (2015–2023) Peer-reviewed journal articles Government or institutional reports	Opinion pieces, blogs, media reports without empirical basis
Language	Sources published in English	Sources not published in English
Accessibility	Documents accessible in full text	Documents inaccessible or unavailable in full text

To guarantee the credibility and relevance of this systematic review, a set of clearly defined inclusion and exclusion criteria was established. The inclusion criteria consisted of WAEC English Language performance data spanning from 2015 to 2023, along with WAEC Chief Examiners' Reports from the same period. Additionally, the study included peer-reviewed journal articles and empirical research specifically addressing English Language performance in Nigeria. Official documents and reports from governmental or educational institutions that dealt with secondary education and English Language assessment were also considered, provided that all materials were published in English. On the other hand, the exclusion criteria ruled out any studies or reports that did not focus directly on English Language or WAEC examinations. Materials published outside the 2015–2023 timeframe were excluded, as were informal sources such as opinion pieces, blogs, and media articles that lacked empirical foundation.

The study relied on both primary and secondary data sources to ensure a comprehensive review:

i. WAEC Annual Reports (2015–2023): These include statistical records of student performance in English Language, disaggregated by year.
ii. WAEC Chief Examiners' Reports: These provide qualitative insights into common student errors, strengths, and weaknesses across examination components (essay, comprehension, grammar, oral English).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202530

iii. Scholarly Articles: Peer-reviewed journals published between 2015 and 2023 covering studies on English Language performance in Nigerian secondary schools.
iv. Government and Institutional Reports: Official policy documents, education sector reviews, and curriculum evaluation reports from agencies such as the Federal Ministry of Education, NERDC, and UNESCO.

Data Collection and Extraction Procedure

The data collection process was systematic and followed a multi-step protocol:

i. Identification: Relevant documents were identified using keyword searches such as "WAEC English performance", "Nigerian secondary education", "Chief Examiners' Reports", and "English language results 2015–2023".
ii. Screening: Documents were screened based on titles and abstracts to assess their relevance. Irrelevant or duplicate materials were removed.
iii. Eligibility Check: Full texts were assessed against the inclusion/exclusion criteria.
iv. Data Extraction: Key information from eligible documents was extracted using a coding sheet, including year, performance statistics, thematic findings from reports, and author conclusions.
v. Categorization: Extracted data were grouped into thematic categories: performance trends, influencing factors (e.g., pedagogy, resources, student attitude), and recommendations.

Data Analysis Techniques

The study employed a qualitative analysis based on Content Analysis and Comparative Analysis. Based on Content Analysis WAEC Chief Examiners' Reports were analyzed thematically to identify recurring patterns in student errors, areas of strength and weakness, and examiner recommendations. Comparative Analysis: Year-by-year comparisons were conducted to highlight performance gaps, improvements, and periods of decline. These analytical techniques allowed for a holistic understanding of the complex dynamics influencing English Language performance in Nigerian senior secondary schools.

Presentation of Results

Research Focus	Language Performance	Year	Results	Findings
Examine the trends and patterns in WAEC English Language performance	Fluctuating pass rates in English (Credit level and above)	2015–2023	53% (2015), 46% (2017), 63% (2021), 58% (2023)	No consistent upward trend; performance varied due to systemic instability, with peak in 2021 and lowest in 2017 (WAEC, 2023).
Identify major factors affecting performance	Declining student proficiency in grammar, essay, and comprehension	All years (2015–2023)	Performance affected by contextual variables	Major factors include poor teaching quality, inadequate materials, lack of motivation, socio-economic constraints, and curriculum misalignment (Ibrahim & Mohammed, 2023).
Assess teaching strategies and curriculum delivery	Exam-centered, teacher-dominated instruction	Across all years	Limited effectiveness	Traditional methods dominated classrooms; curriculum often not aligned with WAEC objectives or communicative competence (Okonkwo, 2021).
Analyze WAEC Chief Examiners' Reports and performance data	Repeated weaknesses in comprehension, summary, grammar	2015–2023	Recurring patterns of failure in language components	Students struggle with understanding questions, essay organization, vocabulary, expression, and grammatical accuracy (WAEC Reports, 2015–2023).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202530

Offer recommendations for improving teaching and learning	Improve proficiency through innovation and support	Post-2023 focus	Recommendations developed based on findings	Suggested reforms include teacher training, curriculum review, better access to reading materials, ICT integration, and promotion of reading culture in schools.

The above table reveals significant fluctuations in students' achievement, with pass rates ranging from 46% to 63%. This inconsistency highlights systemic challenges such as poor teaching quality, inadequate resources, and socio-economic disparities affecting student outcomes. Teaching practices across the years remained largely teacher-centered and exam-driven, which limited the development of communicative competence. WAEC Chief Examiners' Reports consistently identified recurring weaknesses in essay writing, comprehension, grammar, and vocabulary usage, indicating a gap between curriculum expectations and actual student abilities. The findings suggest a misalignment between instructional delivery and examination standards.

Discussions of the major Findings

A longitudinal synthesis of WAEC statistics (2015-2023) confirms a jagged performance curve: credit passes fell from 53 percent in 2015 to 46 percent in 2017, climbed to 63 percent in 2021, then slid to 58 percent in 2023 (WAEC, 2023). Okonkwo (2021) and Ajayi and Salami (2022) read this turbulence as evidence of structural fragility in the school system, while Ibrahim and Mohammed (2023) emphasize year-specific shocks such as COVID-19–related closures. Despite different emphases, all three agree that the ascent recorded in 2021 is an outlier rather than a sustained trend. Regarding causal factors, scholars converge on teacher quality and resource scarcity but differ on their relative weight. Okonkwo (2021) attributes fluctuating outcomes primarily to "pedagogical inertia," arguing that exam-centred chalk-and-talk methods suppress communicative competence. Ajayi and Salami (2022) concur yet foreground infrastructural deficits—textbook shortages, overcrowded classrooms—as equal culprits. By contrast, Bamgbose (2023) stresses macro-level language-in-education policy mismatches, noting that multilingual pupils often encounter English only in formal settings, thereby limiting practice time. The authors collectively highlight socio-economic inequity, but Eze and Okafor (2022) uniquely connect rural poverty to higher absenteeism, suggesting that contextual constraints amplify pedagogical weaknesses. On teaching strategies, consensus centres on the inadequacy of traditional lecture styles. Nonetheless, empirical findings diverge on the impact of innovative practices. Akinyemi and Usman (2021) report an 8–12 percentage-point boost in schools employing debate clubs and formative assessment, whereas Adediran (2022) finds that library access alone, without explicit strategy shifts, yields modest gains. The contrast indicates that structural resources must be paired with pedagogy that actively cultivates reading and writing skills. Analysis of WAEC Chief Examiners' Reports reveals consistent weaknesses in essay organization, vocabulary range, and grammatical accuracy (WAEC, 2015-2023). Ibrahim and Mohammed (2023) interpret these patterns as symptoms of insufficient formative feedback, whereas Okonkwo (2021) links them to misalignment between curriculum objectives and examination demands. Ajayi and Salami (2022) add that minimal exposure to extensive reading hampers lexical development, reinforcing examiners' observations. Drawing from these converging and diverging perspectives, the review proposes a multi-tiered reform agenda. First, all authors concur on the need for systematic in-service teacher development; however, Okonkwo (2021) argues for workshops on communicative language teaching, while Akinyemi and Usman (2021) advocate peer-mentoring models. Second, curriculum realignment should balance grammar drills with authentic language tasks, a recommendation echoed by both WAEC reports and Bamgbose (2023). Third, resource provision must prioritize functional libraries and digital platforms; yet as Adediran (2022) cautions, infrastructure must be integrated into pedagogy to be effective. Finally, targeted interventions for rural and low-income schools—such as mobile reading clinics—address the equity concerns raised by Eze and Okafor (2022). Therefore, authors differ in the emphasis they place on pedagogy, resources, or policy, their findings collectively stress that sustainable improvement in WAEC English performance demands a holistic strategy marrying teacher competence, curriculum relevance, and equitable resource distribution.

Conclusion

WAEC performance data for 2015–2023 reveal a distinctly cyclical pattern rather than a linear progression. Credit-level passes fell from 53 percent in 2015 to a low of 46 percent in 2017, climbed sharply to 63 percent in 2021, and slipped again to 58 percent by 2023 (WAEC, 2023). This volatility signals that improvements are episodic, not systemic. Chief Examiners' Reports across the nine years trace the same fault lines: disjointed essay structures, limited lexical repertoire, and recurrent grammatical errors continue to hamper candidates' scripts. The persistence of these weaknesses suggests deeply rooted instructional and structural problems. A synthesis of empirical studies helps explain the pattern. Okonkwo (2021) attributes the oscillations to a predominantly teacher-centred pedagogy that privileges rote learning over communicative competence. Ajayi

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202530

and Salami (2022) broaden the lens, linking underperformance to chronic shortages of textbooks, libraries, and digital resources—conditions that narrow students' opportunities for meaningful language practice. Meanwhile, Ibrahim and Mohammed (2023) emphasize socio-economic disparities: overcrowded rural classrooms, irregular attendance, and limited parental support compound pedagogical deficits, making consistent gains difficult to sustain. Together, these authors also highlight a policy misalignment between the national English curriculum and WAEC's assessment objectives. The curriculum frequently prioritizes decontextualized grammar drills, whereas the examination demands coherent argumentation and contextual vocabulary use.

Implications for Stakeholders

i. Teachers must shift from rote instruction to communicative, learner-centred methods and engage in continuous professional development to close observed skill gaps.
ii. Students need richer exposure to extensive reading, collaborative tasks and formative feedback to build higher-order language abilities.
iii. Policy makers should align national curricula with WAEC's cognitive demands, ensure equitable distribution of learning resources and institutionalize regular monitoring of instructional quality.

Recommendations for Improvement

i. Structured CPD programmes on communicative language teaching and formative assessment for all English teachers (Okonkwo, 2021).
ii. Curriculum realignment to embed authentic reading-and-writing tasks that mirror WAEC question formats.
iii. Resource enhancement, prioritizing school libraries, digital reading platforms and interactive language software, especially in rural schools (Ajayi & Salami, 2022).
iv. School-based reading initiatives—debate clubs, reading clinics, writing workshops—to cultivate a sustained reading culture.
v. Data-driven feedback loops using WAEC item-analysis reports so teachers can target recurring weaknesses in grammar, vocabulary and essay structure.

References

Adediran, A. (2022). *Library access and students' performance in English Language: A WAEC-based study*. *Journal of Educational Achievement, 12*(1), 45–58.

Akinyemi, F., & Usman, A. (2021). *Teaching methods and English performance in WASSCE: A comparative study*. *African Journal of Pedagogical Practice, 9*(3), 66–78.

Ajayi, K., & Salami, A. (2022). *English language instruction in Nigerian secondary schools: Challenges and prospects*. *Journal of Language and Education Studies, 10*(2), 55–68.

Bamgbose, A. (2023). *Language policy and education in Nigeria: Revisiting the role of English*. *Journal of African Linguistic Studies, 7*(1), 14–29.

Eze, J., & Okafor, N. (2022). *Attitudes and study habits of secondary school students toward English language learning*. *Nigerian Journal of Educational Psychology, 18*(2), 22–37.

Ibrahim, M., & Mohammed, T. (2023). *Teaching practices and examination outcomes: A study of English language performance in Nigerian schools*. *African Journal of Pedagogical Research, 15*(1), 22–39.

Okonkwo, C. (2021). *Rethinking English language pedagogy in Nigeria: A performance-based approach*. *Nigerian Journal of Educational Research and Evaluation, 18*(4), 103–117.

WAEC. (2015–2023). *Chief Examiners' Reports and Statistics of Candidates' Performance in English Language*. West African Examinations Council.

WAEC. (2023). *Statistics of Candidates' Performance in English Language (2015–2023)*. West African Examinations Council.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202531

Assessment of Material Resource Management Practices and Administration of Public Universities in South-South, Nigeria

FELIX, Terhile Bua[1]
Email: Felixbua@gmail.com
Phone: 08036356481

MATTHEW, Odah Otuji[1]
Email: oyiodah@gmail.com
Phone:08060646067

BENJAMIN, Toryila Shaayongo[1]
Email: Felixbua@gmail.com
Phone: 08137866248

[1]Department of Educational Foundations, Faculty of Education, Rev. Fr. Moses Orshio Adasu University, Makurdi

Abstract
The study investigated assessment of material resource management practices on administration of public universities in States South-South, Nigeria. Two research questions guided the study and two hypotheses were tested at 0.05 level of significance. The design adopted for the study was descriptive survey design. The population was 11,174 staff from four public universities in Cross River and Akwa Ibom States South-South, Nigeria. A sample size of 559 staff was used were selected for the study. The sample was selected using a multi-stage sampling procedure technique. The instrument for data collection was researchers-structured questionnaire titled "Material Resource Management Practices and Administration Questionnaire (MRMPAQ)". The questionnaire was validated by three experts in Faculty of Education Benue State University, Makurdi. A reliability test of the instrument was conducted on 30 staff from University of Calabar, Nigeria, using Cronbach Alpha. The result yielded a value index of 0.92 was obtained using Cronbach alpha reliability test. Data collected were analyzed using mean and standard deviation to answer the research questions. Chi-square test of goodness of fit was used to test the hypotheses. The findings of the study revealed that material resource planning and purchasing practices have positive significant impact on administration of public universities in Cross River and Akwa Ibom States South-South, Nigeria. The study recommended that public university administrators should ensure regular and proper material resources management focused on planning and purchasing of material resources in their universities in order to enhance administration of public universities in Nigeria.
Keywords: *Material resource management, planning, purchasing, administration of public universities*

Introduction
Administration is an essential activity in any formal organization including public universities. It is for this reason that one may rightly say that for any organization to achieve success, effective administration cannot be overemphasized. Globally, there have been issues of ineffective administration of public universities over the years. Universities seem to be confronted with numerous challenges. Romina (2023) opines that some of the issues confronting higher education across the globe including Nigerian universities are lack of fund, lack of facilities, frequent labour disputes and closure of universities, inadequate resources and ineffective material resources management. Although Nigerian government and higher education administrators seem to address these issues, Nigerian universities still seem to experience ineffective administration. Administration is the prudent management of scarce and available resources with emphasis on high degree of accountability from subordinates directed towards the achievement of goals and objectives (Venkatesh, 2021). It involves the evaluation and appraisal of results of educational efforts for the purpose of entrenching accountability to all those who have interest in educational enterprise like public universities. Public universities are higher institutions of learning owned and managed by federal and state governments. Federal Republic of Nigeria (FRN, 2014) describes these institutions as citadels of learning for promoting academic excellence for national growth. Public universities are essential for training and development of top-level manpower. Bachelor's degrees and higher degrees such as masters and doctor of philosophy (PhD) degrees are awarded by universities. The importance of public universities cannot be emphasized due to its centrality in the nation's development. The government of Nigeria

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202531

particularly Cross River and Akwa Ibom States seem to pay much attention to effective administration of public universities through provision of resources (human, material, financial, information and time). Despite this effort the public universities in Cross River and Akwa Ibom States seem to experience deficient administration. Although, generally, Bua (2020) opines those problems, such as lack of administrative will, poor leadership, uncooperative attitudes of staff and lack of infrastructural facilities may account for ineffective administration of public universities in Nigeria. In Cross River and Akwa Ibom States South-South, Nigeria, the problem of ineffective administration of public universities may be attributed to material resource management practices. Venkatesh (2021) describes material resource management practices as a coordinated effort to effectively manage the available material resources in the school to promote learning through careful planning, organizing, controlling, coordinating, utilization, maintenance and evaluation of available material resources in the school. The objective of material resource management is to attract material costs on all forms and to optimize the overall end results. Effective material resource management could promote administration of an organization. Cross River and Akwa Ibom States South-South, Nigeria administration of public universities seems not to be yielding the needed result. This may be due to administrators' inability to put in place effective material resources management practices such as planning and purchasing practices.

Planning is the first and foremost function of material resource management and administration of any school. Okwori (2023) defines planning as the determination of educational needs to ensure that limited educational resources are rationally allocated among the various competing educational demands and programmes. Therefore, material resource management in universities need effective planning so as to enhance effective administration of universities. This is because research by Nwafor (2017) found that secondary school teachers material resource skills in planning, coordination, controlling and organizing has significant impact on material resource management in secondary schools. Apali (2014) also found that effective material resource planning help to control inventory levels and schedule replenishment; material resource planning promotes effective inventory management and guides the coordination of materials at different stages of production process. However, Ogbuanya, et al. (2017) in their study revealed that there was no significant difference in mean responses of the respondents on the planning, organizing, controlling and coordinating strategies for proper management of material resources for effective teaching of electrical/electronic technology education. It is through planning that university administrators may identify resource needs of the universities and may decide on the right quality and quantity for purchasing.

Purchasing material resources is a necessary practice for effective school administration especially in universities where it seems there is high demand for utilization of material resources. Purchasing of material resources for administration of universities may mean the process of determining and deciding on procurement of the needed resources and its supply in universities. Izuagie (2015) maintains that the major function of purchasing embraces the flow of materials from the supplies to an organization which has the intention of facilitating the attainment of predetermined objectives. Apali (2014) revealed a positive and significant relationship between material resource management and effective purchasing. Demise (2018) found that schools do not apply purchasing process as planned, there is low maintenance activities in the schools and lack of appropriate training for administrative services. Purchasing simply describes the process of buying; however, in a broader sense, it involves determining the need, selecting the supplier, arriving at a proper price terms and condition, issuing the contract or order and following up to ensure proper delivery.

Although, government, university administrators and relevant stakeholders of universities such as donor agencies, World Bank, philanthropists and unions seem to support effective administration of public universities through provision of material resources, this effort seems to be an exercise in futility. Observation by the researchers, government and university administrators in Nigeria particularly in Cross River and Akwa Ibom States South-South, Nigeria, that administration of public universities is still plagued with the issue of material resource management practices. There seem to be shortage of material resources such as classroom facilities, office equipment, laboratories equipment and library facilities. It is a worrisome and a matter of continuous concern that some of the material resources were not forecasted or determined in number and quantity to be used in universities while others such as instructional materials and utilities seem to be in short supply probably due to lack of proper purchasing practice. All these seem to hinder effective administration of public universities. It is based on the above background that the study sought to carry out assessment of material resource management practices on administration of public universities in Cross River and Akwa Ibom States South-South, Nigeria. Specifically, the study sought to:

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202531

Objectives of the Study

The general objective of the study was to investigate assessment of material resource management practices on administration of public universities in Cross River and Akwa Ibom States South-South, Nigeria. Specifically, the study sought to:

1) Determine the impact of material resource planning practice on administration of public universities in Cross River and Akwa Ibom States South-South, Nigeria
2) Ascertain the impact of material resource purchasing practice on administration of public universities South-South, Nigeria.

Research Questions

The following research questions guided the study:

1 What is the impact of material resource planning practice on administration of public universities in Cross River and Akwa Ibom States South-South, Nigeria?
2 What is the impact of material resource purchasing practice on administration of public universities South-South, Nigeria?

Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance:

1. Material resources planning practice has no significant impact on administration of public universities in Cross River and Akwa Ibom States South-South, Nigeria
2. Material resources purchasing practice has no significant impact on administration of public universities South-South, Nigeria

Methodology

The study adopted descriptive survey research design for carrying out the study. The population for the study comprises 11,174 academic and non-academic staff from four public universities in Cross River and Akwa Ibom States South-South, Nigeria (Planning, Research and Statistics Department of Federal Ministry of Education (2021). The sample size for the study comprises 559 or 5% of the 11,174 academic and non-academic staff in 4 public universities in the study area. The sample was selected using multi-stage sampling procedure. The instrument for data collection was a questionnaire titled "Material Resource Management Practices and Administration Questionnaire (MRMPAQ)". It contained 10 items on the two variables of the study which are material resource planning and material resource purchasing. The questionnaire was structured on a four-point rating scale with response modes of Strongly Agree (SA) =4, Agree (A) =3, Disagree (D) =2 and Strongly Disagree (SD) =1. For content and construct validity, the questionnaire was validated by three experts in Faculty of Education Benue State University, Makurdi. For internal consistency, a reliability test of the instrument was conducted on 30 staff from University of Cross River State Calabar using Cronbach Alpha and the result yielded 0.92. The data obtained from the study were analyzed using descriptive statistics of mean scores and standard deviations to answer the research questions. Decision was based on the mean cut off point of 2.50. Any mean score below 2.50 was not regarded as agree, while mean scores of 2.50 and above was regarded as agree. Chi-square test of goodness of fit was used to test the hypotheses at 0.05 level of significance. The decision rule of the chi-square is that if the chi-square calculated is greater than p-value of 0.000 the null hypothesis is not rejected but if it is less than 0.000, the null hypothesis was rejected.

Presentation of Results

Research Question 1

What is the impact of material resources planning practice on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria?

Table 1: Mean and Standard Deviation Rating on Impact of Material Resources Planning Practice on Administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria

S/No	Item Description	N	SA	A	D	SD	$\bar{X}$	*SD*	Decision
1	Specific objectives for using material resource are formulated to achieve university goals.	559	156	277	96	30	2.98	0.80	Agree
2	Material resources are planned based on university needs to enhance university administration.	559	158	90	162	149	2.59	1.14	Agree
3	Standards are set using office equipment to enhance school administration.	559	205	154	140	60	2.86	1.01	Agree
4	Teaching materials are planned in advance for achieving universities goals in producing quality students.	559	137	230	122	70	2.73	0.94	Agree

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202531

5	Lack of proper planning for material resources will inhibit achievement of university objectives	559	189	156	106	108	2.72	1.11	Agree
	Cluster Mean						**2.77**		**Agree**

Source: Researchers' Field Work, 2025

Table 1 shows Mean ratings of 2.96, 2.59, 2.86, 2.73, 2.72, and cluster mean 2.77 with a corresponding Standard Deviation rating of 0.80, 1.14, 1.01, 0.94 and 1.11 respectively. The result indicated that items 1-5 individual ratings agreed that specific objectives for using material resource are formulated to achieve university goals, material resources are planned based on university needs to enhance university administration, standards are set using office equipment to enhance school administration, teaching materials are planned in advance for achieving universities goals in producing quality students and lack of proper planning for material resources will inhibit achievement of university objectives. The cluster Mean value of 2.77 was found to be above the Mean score benchmark of 2.50. This shows positive impact of impact of material resources planning practice on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria.

Research Question 2

What is the impact of material resources purchasing practice on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria?

Table 2: Mean and Standard Deviation Rating on impact of Material Resources Purchasing Practice on Administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria

S/No	Item Description	N	SA	A	D	SD	$\bar{X}$	*SD*	Decision
6	Cost of purchasing material resources needed in universities is determined by the administrators.	559	177	251	13	118	2.83	1.07	Agree
7	Timely purchase of material resources enhances effective universities administration.	559	234	215	68	85	2.88	1.03	Agree
8	Proper negotiation of the cost of material resources is carried out before they are purchased.	559	182	163	68	113	2.82	1.13	Agree
9	High cost of material resources lead to less purchase thus, inhibiting university administration.	559	242	223	103	69	2.82	0.97	Agree
10	Material resources are supplied in universities in the right quantity no matter the cost.	559	215	196	122	72	2.77	0.99	Agree
	Cluster Mean						**2.82**		**Agree**

Source: Researchers' Field Work, 2025

Table 2 shows Mean ratings of 2.83, 2.88, 2.82, 2.82, 2.77, and cluster mean 2.82 with a corresponding Standard Deviation rating of 1.07, 1.03, 1.13, 0.97 and 0.99 respectively. The result indicated that items 6-10 individual ratings agreed that cost of purchasing material resources needed in universities is determined by the administrators, timely purchase of material resources enhances effective universities administration, proper negotiation of the cost of material resources is carried out before they are purchased, high cost of material resources lead to less purchase thus, inhibiting university administration and material resources are supplied in universities in the right quantity no matter the cost. The cluster Mean value of 2.82 was found to be above the Mean score benchmark of 2.50. This shows positive impact of material resources purchasing practice on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria

Hypothesis 1

Material resources planning practice has no significant impact on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria.

Table 8: Chi-square Analysis Summary of Impact of Material Resources Planning Practice on Administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria.

Responses	Frequency Observed	Frequency Expected	*P-Value*	Df	x^2 Cal.	Decision
SA	169	139/75				
A	181	139.75	0.000	3	242.326[a]	Sig.
D	126	139.75				

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202531

SD	83	139.75
Total	**559**	

Source: Researchers' Field Work 2025

Table 3 showed Chi-square calculated value of 242.326[a]at 3 degree of freedom=0.000 is less than 0.05. With this result, the null hypothesis which states that, material resources planning practice has no significant impact on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria was rejected. This can be interpreted to mean that material resources planning practice has positive significant impact on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria.

Hypothesis 2

Material resources purchasing practice has no significant impact on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria.

Table 4: Chi-square Analysis Summary of Impact of Material Resources Purchasing Practice on Administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria.

Responses	Frequency Observed	Frequency Expected	*P-Value*	df	x^2 Cal.	Decision
SA	163	139.75				
A	139	139.75	0.000	3	215.985[a]	Sig.
D	76	139.75				
SD	91	139.75				
Total	**559**					

Source: Researchers' Field Work 2024

Table 4 showed Chi-square calculated value of 215.985[a] degree of freedom=0.000 is less than 0.05. With this result, the null hypothesis which states that, material resources purchasing practice has no significant impact on administration of Public Universities in Cross River and Akwa Ibom States was rejected. This can be interpreted to mean that material resources purchasing practice has positive significant impact on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria.

Discussion of Findings

The first finding of the study showed that material resources planning practice has positive significant impact on administration of Public Universities in Cross River and Akwa Ibom States South-South, Nigeria. This finding means that specific objectives for using material resource are formulated to achieve university goals, material resources are planned based on university needs to enhance university administration, standards are set for using office equipment to enhance school administration, teaching materials are planned in advance for achieving universities goals in producing quality students and lack of proper planning for material resources will inhibit achievement of university objectives. This finding is in line with the findings of Nwafor (2017) whose finding shows that secondary school teachers material resource skills in planning, coordination, controlling and organizing has significant impact on material resource management in secondary schools. The finding is also in line with the findings of Apali (2014) whose finding shows that effective material resource planning help to control inventory levels and schedule replenishment; material resource planning promotes effective inventory management and guides the coordination of materials at different stages of production process. The finding of the study however disagrees with the findings of Ogbuanya, Nweke and Ugwoke (2017) whose findings revealed that there was no significant difference in mean responses of the respondents on the planning, organizing, controlling and coordinating strategies for proper management of material resources for effective teaching of electrical/electronic technology education. The second finding of the study showed that material resources purchasing practice has positive significant impact on administration of Public Universities. This finding means that the cost of purchasing material resources needed in universities is determined by the administrators, timely purchase of material resources enhances effective universities administration, proper negotiation of the cost of material resources is carried out before they are purchased, high cost of material resources lead to less purchase thus, inhibiting university administration and material resources are supplied in universities in the right quantity no matter the cost. This finding agreed with the finding of Apali (2014) whose findings revealed a positive and significant relationship between material resource management and effective purchasing. This finding however disagreed with the finding of Demise (2018) whose finding showed that school do

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202531

not apply purchasing process as planned, there is low maintenance activities in the schools and lack of appropriate training for administrative services.

Conclusion

Based on the results of the study, it was concluded that material resource management practices have enhanced administration of public universities in Cross River and Akwa Ibom States South-South, Nigeria This implies that improvement in material resources planning, purchasing, organizing, controlling, coordinating, maintenance and evaluation practices have brought about significant positive improvement on administration of public universities in Cross River and Akwa Ibom States South-South, Nigeria

Recommendations

Based on the findings of the study the following recommendations were made.

1. Public university administrators in Nigeria should ensure that there is proper planning of material resource management in their universities in order to enhance administration of public universities in the states.
2. The public university administrators should ensure that there is proper and adequate material resource purchasing practices that recognize taking stock of materials and with accurate costs to ensure the right purchase of materials resources for effective administration of public universities in Nigeria.

References

Apali, C. (2014). *Material resource planning and effective purchasing: A case study in Crown Beverages Limited Uganda* (Master's dissertation). Kampala University.

Bua, F. T. (2020). *Educational management: A grassroots approach*. Makurdi.

Demisse, L. H. (2018). *Management of educational material resources in secondary schools in Yaya Gulale Woreda North Shoa Zone* (Master's dissertation, Addis Ababa University).

Federal Republic of Nigeria. (2014). *National policy on education*. Nigerian Educational Research and Development Council.

Izuagie, F. O. (2015). *Material resource management skills needed by preschool teachers in Ondo State, Nigeria* (Unpublished master's dissertation). University of Nigeria, Nsukka.

Nwafor, K. E. (2017). Material resource management skills required by secondary school teachers in Delta State of Nigeria. *Journal of Social Science, 3*(1), 19–27.

Ogbuanya, T. C., Nweke, J. N., & Ugwoke, S. C. (2017). Material resource management for effective teaching of electrical/electronics technology in colleges of education (technical) in Nigeria. *International Journal of Applied Engineering Research, 12*(18), 7238–7253.

Planning, Research and Statistics Department of Federal Ministry of Education (2021). Staff population of the public universities in Cross River and Akwa-Ibom State, Nigeria.

Romina, I.A. (2013). Challenges of quality in higher education in Nigeria in the 21st century. *International Journal of Educational Planning & Administration*, 2(2), 159-172.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202532

Effect of Token Economy Counselling Technique on Truancy Behavior among Primary School Pupils in Ado-Odo Ota Local Government Area, Ogun State

YAKUBU, A. Mallum[1]
Email: totomeleto@gmail.com
Phone no: 08037170842

KOLAWOLE, Susan A.[1]
Email: prodigiousfunke@gmail.com
Phone no: 08037000289

RAFIU, Akanni Akeem[1]
Email: Rafiuakeem552@gmail.com
Phone no: 07065589157

[1]Department of Educational Foundations, Faculty of Education, University of Jos

Abstract
The study centered on the effect of token economy counselling technique on truancy behavior among primary school pupils in Ado-Odo Ota Local Government Area of Ogun State. Four objectives, research questions and hypothesis were developed in the course of the study. A true experimental and simple random technique was used in selecting 150 pupils from an intact class out of which male are 87 and female are 63. The four research questions and the hypothesis which sort to find out the effect of the technique were answered and tested at 0.05level of significant and ANCOVA was used to analyse the result. The instrument used are class attendance register and pupils truancy behavior questionnaire (PTBQ). From the findings it was recommended that training of counsellor should be organized through seminars, workshop and symposium with more emphasis on token economy counselling technique in dealing with truancy behavior primary school pupils, token economy counselling technique inculcated into school curriculum in order to reduce truancy behavior among primary school pupils and all teachers should be exposed to training and token economy counselling technique.

Introduction
Primary education is the education that is given to pupils age 6 and above. It is the foundation in which other level is built upon. The objectives of primary education is to enable children to learn arithmetic, numeracy, and other basic skills that are needed for further education, pupils are expected to come to school from morning till afternoon after which they are to close. Most of the children usually come alone and they go back on their own. Every registered pupil is expected to be in school and must be present in school, engage in class attendance and activities regularly in order to achieve academic excellence and sound education. While some pupils are punctual some are not, hence skipping out of the class without good reasons. The ability of a child to stay off the school without parents or school authority is called truant. The person who habitually stays away from school without good reasons is a truant. He or she is irregular at school attendance but finds other places more attractive than that of school. Therefore, truancy has been identified and regarded as a serious problem which tenders the academic performance and school success at a high risk because they are not always takes part in class activities.

Token economy counselling technique is a secondary reinforcement system of positive behaviour support where by token (i.e conditional reinforce) are delivered to pupils for exhibiting specific behaviour. Token economy counselling technique is use as a motivator of desire target behaviour which is demonstrated when a pupil is immediately given a token which can be a physical material things like biro, pencil, money, biscuit, sweet and award of point for exhibiting desire behavoiur in the school. Token economy counselling techniques works by specifying behavour to be performed as well as the consequence for performing them because performance of behaviour describe in token usually dictate the delivery of immediate consequences and when employed in classroom setting, they are meant to motivate pupils. Available evidences shows that some primary school children play truancy in school were they absent themselves from school. For example, statistic from school register showed that 20% of the pupils hardly attend school and some that attend, usually leave the school before closure. Some reasons for such truancy among pupils is that some are involved in inter border trading where they make money from it. Some are into drugs and other form of misbehavior.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202532

Objectives of The Study

1. Determine the pre-test and post-test truancy behaviour mean scores of pupils in experimental and control group.
2. Establish the post-test truancy behaviour mean score of male and female pupils.
3. Determine the pre-test and post-test attendance mean scores of pupils in the experimental and control group.
4. Examine the post-test attendance mean scores of male and female truant pupils in the experimental group.

Research questions

1. What is the pre-test and post-test truancy behaviour mean scores of pupils in experimental and control group?
2. What is the post-test truancy behaviour mean score of male and female pupils?
3. What is the pre-test and post-test attendance mean scores of pupils in the experimental and control group?
4. What is the post-test attendance mean scores of male and female truant pupils in the experimental group?

Hypotheses

Ho_1: There is no significant difference in the pre-test and post-test truancy behaviour mean scores of pupils in experimental and control group.

Ho_2: There is no significant difference in the post-test truancy behaviour mean score of male and female pupils.

Ho_3: There is no significant difference in the pre-test and post-test attendance mean scores of pupils in the experimental and control group.

Ho_4: There is no significant difference in the post-test attendance mean scores of male and female truant pupils in the experimental group.

Concept of Truancy

Truancy is one of the many inappropriate behaviour by primary school pupils in Ogun State. According to UNESCO Institute of Statistics (UIS, 2016) 8.7 million Nigeria children are out of school and more females than males will never get education, they shall be forced to sit up to take care of their younger ones and do house chores. Earlier statistics released by the office of the youth and social development, an arm of the Ogun State ministry of youths, sports and social development shows that of the entire identified indiscipline act among pupils in Ogun state primary schools, truancy had the largest number of 2,095 pupils. Childhood truancy has been linked to negative social and health outcomes later in life. Adult who were truants as teenagers were more likely than their counterparts who were not truants as adolescents to experience marital or employment instability as well as psychological maladjustment. Truancy for example has been shown to have a negative impact on pupils academic achievements, promotion, graduation, self-esteem and employment prospects. Majority of pupils who are frequently truants in primary school fail to graduate in a longitudinal study. Failure to graduate is unquestionably linked to lower any potential in childhood and other negative outcomes.

Approaches To the Study of Truancy

1. Individual factors for example pupils', family, community.
2. Institutional factors

Considering the fact that different categories of pupils' stay away from school for different reasons – intelligence, gifted as well as unintelligent children. It has become necessary to examine different approaches suggested and employed in different places in managing the issue of truancy. According to Reimer and Dimock (2005) student get involved in truancy for many reasons, some external to school and some education-related. As a result, it is difficult to predict which student will become a truant since there have not been rigorous evaluation of truancy prevention and reduction programmes. There is also no evidence that point to the "best" programmes and practices that will reduce the truancy rate. The implementation of the same strategy may vary from place to place, so results to the same programme may differ. Nevertheless, the results of existing programmes and practices provide useful insight when developing intervention strategies. Programmes and practices fall into two broad categories: Comprehensive school-wide strategies (e.g., educational reform models and strategies to increase a student's sense of belonging and engagement) and those that focus on meeting the needs of individual pupils'. These researchers noted that a variety of promising programmes and practices exist within each category and that successful implementation of these strategies will require the political will of policy makers, educators, families and communities, a sustained commitment and over time, increased and redirected resources and focused attention on the person and academic needs of pupils'. Smink and Reimer (2005) in the same vein, observed that reducing truancy rate require urgent attention from policy makers. The researchers outlined the broad strategies for reducing truancy rates as follows: Provide rules that will prevent pupils' from staying away from school, address the root causes of truancy, strengthen school readiness, strengthen the skills, and motivate the pupils' to practice regular school attendance.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202532

Concept of Token Economy

Token economy systems, also referred to as token reward systems, are a type of intervention strategy that has been utilized since the beginning of the 19th century (Ivy et al., 2017). In brief terms, rewards are given to individuals when they perform a certain behaviour, response, or task that is desired by the intervention administrator. These rewards are intended to reinforce that the behaviour, response, or task will happen again. In psychology terminology, this type of reinforcement is also known as operant conditioning. Throughout history, reward-based interventions have been used among humans and animals. More specifically, (Ivey, Ivey, Downing, 2017) said that token economies have been developed for use in classrooms, psychiatric inpatient programs, community-based rehabilitation group homes, vocational settings, college courses, and in sport training, also, token economies have been found to be effective across the life span, from young children to geriatric adults, and across both typically developing and clinical populations. (p. 709-710)

Benefits of Token Economy Systems

When beginning any new intervention, understanding its benefits is vital to determining if it may produce successful results for a particular study. For example, in special education, it can be important to keep lessons moving and attempt to diminish interruptions as much as possible. Diamond, Wagner and Lovy (2016) stated that "token reward systems are beneficial for pupils', including those with severe disabilities who may have difficulty attending to teacher instruction by relying solely on intrinsic motivation" (p. 75). The use of rewards in token systems allow for the implementation of extrinsic motivation which may be just as effective. Motivation will be discussed further later in this paper. In the classroom, maintaining student attention can also be difficult. However, token reward systems also provide benefits in this area as well. Diamond, Wagner and Lovy (2016) said "these systems are valuable in that they allow teachers to reinforce correct behaviours/skills without impeding the flow of instruction by delivering backup reinforcers after a specified number of tokens are earned" (p. 75). If a teacher must stop a lesson to provide feedback, pupils may lose attention and it can be difficult to gain it back. The ability to give tokens quickly and quietly decreasing the likelihood of disruptions to teaching. Students with special needs are often transitioning among several settings (e.g., special education classroom, general education classroom, speech office, gym, music, recess) so finding a reward system that can be easily utilized in many settings is important. Another benefit described by Ivey, Ivey and Downing (2017) is that tokens are easily portable allowing for their use across multiple settings and times (p. 712). Token rewards systems' ability to be easily portable can make them highly appealing in a special education setting. Also, "a token can be used to maintain performance during periods of time in which the backup reinforcer is not available" (Ivey, Ivey and Downing 2017). This creates advantages when pupils are in various environments throughout the day. The token system can still be utilized and effective even if the reinforcer is not present.

Methodology

The study adopted true experimental research. The population of the study consisted of all primary six pupils in Idi Ota primary schools and Oke Ore under Ado Odo Local Government Area of Ogun State. The Local Government has a total number of 56 primary schools with a population of 11247 primary six pupils. The sample of the study consisted of 65 pupils from two primary school which include: Idi Ota primary school and Oke Ore Methodist primary school. Oke Ore methodist primary school with a sample of 33 was used as experimental group while Ido Ota with a sample of 32 was used as control group. The primary school pupils used were identified to be exhibiting truancy behavior. Three instruments were used for data collection. The instruments used include social studies achievement test, pupils' truancy behavior questionnaire (PTBQ) and attendance register.

Research Question One

Result of the analysis on truancy behaviour of pupils between the experimental and control group using mean and standard deviation.

Group		N	X	X	Mean gain	Mean difference
Experimented	Pre –test	33	37.72	6..01		
	Post –test	33	26.90	8.34	-10.82	
Control	Pre –test	32	38.03	4.94		-11.79
	Post –test	32	38.69	5.85	-0.66	

The result indicates a mean difference of -11.79. This implies that Token economy helps to reduce truancy behavior of primary pupils more than conventional method.

Research Question Two

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202532

Results of the analysis on truancy behavior of male and female pupil in the experimental group using mean and standard deviation

GROUP		N	X	SD	Mean Group	X Difference
Male	**Pre-test**	23	36.96	5. 00		
	Post-test	23	26.87	7.59	=10.09	
Female	**Pre-test**	42	37.84	7.99		0.43
	Post- test	42	26.44	12.79	-11.40	

The result indicates a mean difference in the post truancy mean score between the male and the female of 0.43 in favor of females hence it can be concluded that token economy help to reduce truancy behavior among males than females.

Research Question Three

Result of the analysis of attendance mean scores of pupils in the experimented and control.

Group		N	X	X	Mean gain	Mean difference
Experimented	Pre –test	33	67.40	12.45		
	Post –test	33	73.41	15.77	6.01	
Control	Pre –test	32	68.40	11.41		0.47
	Post –test	32	72.94	12.48	4.54	

This implies that Token economy improve the attendance of pupils in school more than conventional method.

Research Question Four

Result of the analysis on attendance mean score of male and female pupils in the experimental group.

Group	N		x	SD	Mean Gain	Mean difference
Male	Pre –test	33	62.66	11.14		
	Post –test	33	72.67	15.74	10.01	
Female	Pre –test	33	63.01	7.54		0.8
	Post –test	33	73.47	12.45	10.46	

The result showed the mean difference of 0.8 in favour of female. This implies that Token economy increases the attendance of females more than males.

Hypothesis One

Summary of ANCOVA Analysis on the truancy behavour mean score of truant pupil in the experimented and control groups

Source	Type sum of square	Of	Mean square	F	Sig	Partial squared	Eta
Corrected model	2593.6769	2	1296.838	11.855	.001	.277	
Intercept	3939.300	1	3939.300	36.015	.001	.367	
pre achievement	141.771	1	141.771	1295	.259	.020	
Group	2363.754	1	2363.254	21.606	.001	.058	
Error	6781.463	62	109.378				
Total	97548.000	65					
Corrected total	9375.138	64	0				

a R squared = 277 (adjusted R squared 253

We can conclude that token economy helps to reduce truancy among pupils more than conventional method.

Hypothesis Two

Summary of AVCOVA Analysis on post-test truant behavior mean score male and female pupils in the experimented and control group

Source	Type II sum of square	Df	Mean square	F	Sig	Partial Efa

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202532

Corrected model	38.210	2	19.105	7.37	.484	.008
Intercept	5879.2931	1	5879.293	285.631	.001	.05
Presender	4.417	1	4.417	.170	.682	.001
Gender	37.496	1	37.466			
Error	1615.544	30	26.057	14.39	.235	.023
Total	104935.000	33				
Corrected total	1053.754	32				

a R Square =.023(Adjusted R square = 0.08
We can conclude that Token economy does not affect the truancy behavior of pupils based on their gender.

Hypothesis Three

Summary of ANCOVA Analysis on the post-test attendance mean score of male and female truant pupils in the experimented group

Source	**Type III sum of squares**	**Df**	**Sum of square**	**F**	**Sig**	**Partial squared**	**Efa**
Corrected model	10512.231	2	5256.115	282.833	.000	.787	
Intercept	3850.605	1	3850,605	207.202	.000	.575	
Pre attendance	575.778	1	575.778	30.983	.000	.168	
Group	9415.978	1	9415.978	506.676	.000	.768	
Error	2843.327	62	18.584				
Total	126271.000	65					
Corrected total	13355.558	64					

A R Squared = 787 (Adjusted R square =784
We can conclude that token economy helps to improve pupil's attendance more than conventional method.

Hypothesis Four

Summary of ANCOVA Analysis on the post-attendance mean scores of male and female pupils in the experimented group

Source	**Type III sum of squares**	**Df**	**Mean square**	**F**	**Sig**	**Partial square**	**Eta**
Corrected model	736.368	2	368.193	1.983	.45	.052	
Intercept	22447.254	1	22447.254	120.902.	000	.624	
Pre attendance	686.537	1	686.337	3.698	.058	.048	
Group	36.167	1	36.167	.195	.660	.003	
Error	13553.548	30	185.66				
Total	326739.000	33					
Corrected total	14289.934	32					

a R Squared = .052 (Adjusted R squared =0.26
We can conclude that token economy does not affect pupils attendance based on gender.

Summary Of Finding

1. Token economy counseling technique helps to reduce truancy behavior among primary six truancy pupils.
2. Pupil achievement in social studies was not affected by their gender
3. Token economy counseling technique helps to improve pupil's attendance.

Discussion of Finding

The result shows that the experimental group had truancy behavior mean score of 37.72, SD = 6.06. While control group had truancy mean score of 38.83 with SD of 4.94 and post-truancy mean score of 38.69, SD = 5.85 with mean gain of 0.66 which indicate that mean score difference of 11.29 which shows that token economy help reduce truancy behavior of primary school pupils. In research question two, it was also found that post-truancy mean score of 38.96, SD=5.00 and post-truancy mean score of 26.87, SD=7.59 with mean loss of 10.09 while the control group had pre-truancy mean score of 37.84, SD=7.99 and post-truancy mean score of 26.44, SD=12.29 with means loss of 11.40. The research shows that a mean score difference in post-truancy score between the male and female of 43 females hence it could be concluded that token economy helps to reduce truancy behavior among male than female. The finding agree with Mamman (2015) that token economy is effective in reducing truancy behavior.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202532

Conclusion

1. From the study finding, it was concluded that there was a significant in the rate of truancy reduction on the post-test experimental which shows token economy counselling technique in truancy reduction among primary school pupils.
2. The technique is gender sensitive for there was a significant effect in the rate of truancy reduction on the post-experimental of male and female.
3. The technique is also very effective in reducing truancy behavior rather than conventional method.

Recommendation

1. Training of counsellor should be organized through seminars, workshop and symposium with more emphasis on token economy counselling technique in dealing with truancy behavior primary school pupils.
2. Token economy counselling technique inculcated into school curriculum in order to reduce truancy behavior among primary school pupils.
3. All teachers should be exposed to training and token economy counselling technique.

Reference

Abdullahi A. (2018). Causes and Effects of Truancy among Primary School Pupils in Zaria Local Government Kaduna State: *Journal of Assertiveness* vol.13 No.1 Nov; 2018 ISSN2276-9684.

Dembo, R & Gulledge, L. M. (2009). *Truancy intervention programmes. Challenges and innovations to implementation.* Criminal Justice Policy Review 20(4), 437-456.

Fauzia A. (2014). *Causes of Truancy among public Secondary School pupils' in Azare metropolis Bauchi State:* unpublished M.Ed thesis.

Federal Republic of Nigeria (2013). *National policy on educational. Lagos:* Nigeria Educational Research and Development Council.

Fredrick, L. N. (2011). *The factors that define exclusion in primary school education:* A case of community primary schools in Babati-Manyara. Unpublished Masters Dissertation, International Institute of Social Studies. (ISS).

Galloway, D. (2001). *Rich schools poor schools: The promises of equal educational opportunity.* Chicago: The University of Chicago Press.

Garry, E. M (2001). *Truancy: First step to life time of problems*. Official Bulletin of Juvenile Justice and Delinquency Prevention. US: Department of Justice.

Otopa, F.A. (2009). *The Incidence and Causes of Truancy in Senior High Schools in Cape Coast Metropolis:* Implication for Counselor and Parents: Unpublished Master Dissertation of University of Cape Coast, Ghana.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202533

Ensuring Access, Equity and Quality of Guidance and Counselling Education amidst Insecurity in Nigeria: Challenges and Strategic Interventions

LAWAL, Anas Maishanu[1]
Email: anasmaishanu20@gmail.com
Tel: 08063166470

ANAS, Abdullahi[1]
Email: anasabdul808@gmail.com
Tel: 08138040620

MUHAMMAD, Binta[1]
Email: bintamuhammad@fugusau.edu.ng
Tel: 08135439521

ABUBAKAR, Sadiq Haruna[1]
Email: asharuna@fugusau.edu.ng
Tel: 07066994040

NUHU, Usman[1]
Email: nuhuusman32@gmail.com
Tel: 08032804565

[1]Department of Educational Foundations, Federal University Gusau, Zamfara State.

Abstract
This paper examines the critical issue of, access, equity and quality of guidance and counseling education amidst Nigeria's insecurity crisis, particularly in the context of ongoing security challenges such as insurgency and banditry. The increasing levels of insecurity have disrupted the delivery of counselling services and education, which are essential for the personal, academic, and career development of students. The paper explores the impact of insecurity on curriculum implementation, safety concerns for both counsellors and students, and funding challenges. It also suggests quality assurance measures, including the integration of online platforms, community engagement, and the use of technology for remote supervision, to sustain the effectiveness of counselling education and services. The discussion emphasizes the urgent need to address these challenges to ensure that counselling education remains accessible, equitable, and of high quality, despite the ongoing insecurity.
Keywords*: Equity, Access, Quality, Counselling Education, Insecurity, Nigeria, Online Platforms, Community Engagement*

Introduction
Guidance and counselling education plays a crucial role in fostering the personal, social, academic, and career development of individuals, particularly students. In Nigeria, the increasing complexity of societal challenges—such as rapid technological advancements, economic shifts, socio-cultural changes, and rising insecurity—has underscored the need for professional support systems that promote mental well-being and academic success. For instance, recent data reveals that between 2014 and 2022, over 1,500 students were abducted in Nigeria due to school attacks, with more than 60% of these incidents occurring in the northern region (Global Coalition to Protect Education from Attack [GCPEA], 2023). Additionally, the United Nations Children's Fund (UNICEF, 2022) reports that over 10 million Nigerian children are out of school, largely due to insecurity and displacement. These statistics highlight the urgent need for guidance and counselling services to address the psychological trauma and educational disruptions faced by students. Educational institutions, being primary environments for youth development, are ideal settings for the implementation of effective guidance and counselling services. These services not only assist students in navigating academic pressures but also provide a platform for addressing emotional and psychological concerns (Olayemi, 2017). Theoretical frameworks such as Maslow's Hierarchy of Needs and Super's Career Development Theory provide a robust foundation for understanding the role of guidance and counselling in addressing students' needs.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202533

Maslow's theory emphasizes the importance of addressing basic needs, such as safety and belonging, before students can achieve self-actualization and academic success (Maslow, 1943). Similarly, Super's theory highlights the importance of career guidance in helping students navigate developmental stages and make informed career decisions (Super, 1957). Moreover, with the rising demand for career readiness and decision-making skills, it is evident that the integration of guidance and counselling into the educational curriculum is vital for preparing students for the dynamic demands of the future workforce (Afolabi & Adebayo, 2019). In the Nigerian context, this aspect of education is fundamental in ensuring that students have the support necessary to thrive in a complex, often stressful environment. Thus, the importance of guidance and counselling in Nigeria's educational system cannot be overstated, as it significantly influences the overall development and success of the nation.

Current State of Insecurity in Nigeria: Effects on Educational Institutions

In Nigeria, insecurity has a long-standing history, marked by conflicts and violence that have affected various aspects of societal life, particularly education. One of the most prominent security threats in recent times has been the insurgency carried out by the extremist group, Boko Haram, which has been active since 2009. The group, whose name roughly translates to "Western education is forbidden," had targeted educational institutions, resulting in the abduction of students and the destruction of schools, particularly in the northern part of Nigeria. This has led to the closure of many schools and a significant disruption in educational activities (Pate, 2018). More recently, banditry has emerged as another severe security threat across Nigeria, particularly in the northwest and central regions. Armed groups have been involved in abductions, killings, and attacks on schools, further exacerbating the challenges of education in affected areas. In 2021 alone, dozens of schools were attacked, and hundreds of students were kidnapped for ransom (Mustapha & Ibrahim, 2021). These acts of violence have intensified fears and discouraged enrollment, especially in rural and conflict-prone regions. The effects of this persistent insecurity on Nigeria's educational institutions are profound. Students live in constant fear, and many are unable to attend schools regularly, particularly in the northern and northwestern regions. Educational facilities have also been damaged or destroyed, leading to a lack of infrastructure for teaching and learning. Teachers and educational staff face the threat of violence, which impacts their ability to deliver quality education. Consequently, the nation is witnessing an increase in educational disparities, as those in conflict-affected areas face challenges in accessing education (Agbu, 2019). Furthermore, the psychological toll on students who are exposed to such violence cannot be understated, as many face trauma, stress, and a disruption of their academic goals. In response, the Nigerian government and various stakeholders have initiated several measures to improve security in schools, such as the establishment of school safety initiatives and collaborations with international organizations. However, the persistence of these security challenges continues to undermine educational development, highlighting the urgent need for a comprehensive and sustained effort to address the root causes of insecurity in the country (Adebayo &Oyedepo, 2020).

Challenges Facing Guidance & Counselling Services amidst Insecurity in Nigeria

The increasing levels of insecurity in Nigeria, largely driven by insurgency, kidnapping, communal clashes, and other forms of violence, have had profound impacts on the educational sector. Guidance and counselling services, which are essential for supporting the psychological, emotional, and academic well-being of students, have faced numerous challenges due to the escalating security concerns. These challenges are manifest in disruptions to curriculum implementation, safety issues for both counsellors and students, and financial constraints that hinder the effective delivery of these services. This paper explores these challenges and their implications for guidance and counselling services in Nigerian schools.

Impact on Curriculum Implementation

Insecurity significantly disrupts the implementation of guidance and counselling services within Nigerian schools. According to Akinmoladun and Olowookere (2020), schools in conflict zones, particularly in the northeastern and north-central regions of Nigeria, face constant interruptions that affect the regular scheduling and delivery of counselling programs. Teachers and counsellors are often unable to carry out their planned sessions due to insecurity-related school closures, evacuation orders, and displacement of students and staff. The lack of a stable environment for learning and personal development also affects students' engagement with counselling services, which can directly undermine their emotional and psychological growth. Furthermore, security concerns have led to the postponement or cancellation of extracurricular activities, including workshops, seminars, and outreach programs designed to support students' mental health (Okunola & Ayodele, 2019). These disruptions leave students vulnerable, especially those who are already struggling with the effects of trauma caused by the ongoing insecurity in their communities.

Safety Concerns for Counsellors and Students

The safety of both counsellors and students is a paramount concern in regions of Nigeria affected by insecurity. In many cases, counsellors are either forced to abandon their duties or take extra precautions to avoid exposure to danger. For instance, some counsellors have reported being threatened by armed groups, and this has led to a decrease in their willingness to engage in

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202533

counselling services (Eze, 2021). For students, the threat of abductions or attacks while attending school creates an atmosphere of fear and apprehension, making it difficult for them to access counselling services. The fear of potential violence often discourages students from participating in counselling sessions, as they prioritize their safety over seeking support. Additionally, insecurity disrupts the safe spaces that schools are supposed to provide, leaving students without a reliable support system in the face of academic or personal difficulties (Fagbemi, 2020).

Funding Issues

Another significant challenge faced by guidance and counselling services in Nigeria amidst insecurity is the issue of inadequate funding. As insecurity escalates, educational institutions are forced to divert financial resources to address immediate security concerns, such as employing private security guards, installing surveillance equipment, and building fortifications around school premises (Ojo & Eze, 2020). This reallocation of funds often comes at the expense of counselling services, which struggle to receive adequate financial support for training, materials, and the recruitment of professional counsellors. Inadequate funding limits the capacity of schools to provide necessary counselling resources, including career guidance tools, mental health materials, and access to external experts. In the face of these financial constraints, many schools are unable to expand or even maintain the counselling programs they already have, thereby further undermining their effectiveness (Adebayo, 2019).

Access, Equity, and Quality of Counselling Education in Nigeria amidst Insecurity

The provision of quality education in Nigeria, especially in the field of counselling, faces numerous challenges, with insecurity being one of the most significant obstacles. Insecurity in various regions of Nigeria, including insurgency, communal clashes, and other forms of violence, has a profound impact on educational access, equity, and the overall quality of education, including the specialized area of counselling education.

1. Access to Guidance and Counselling Education

Access to counselling education is a critical issue in Nigeria, particularly in areas severely impacted by insecurity. The instability caused by violence, kidnappings, and armed conflicts has led to the closure of schools and universities in affected regions, which in turn limits access to training for future counsellors (Eze, 2021). Furthermore, insecurity discourages students from enrolling in counselling programs or completing their education, as they may feel unsafe traveling to academic institutions or attending classes during times of conflict (Fagbemi, 2020). These barriers hinder the growth of counselling education programs, resulting in fewer opportunities for prospective students, especially those in rural or conflict-prone areas, to gain the necessary qualifications to enter the profession.

2. Equity in Guidance and Counselling Education

Equity in education refers to the fair distribution of educational resources and opportunities, ensuring that all students, regardless of their socioeconomic background, ethnicity, or geographical location, have equal access to quality education. In Nigeria, the issue of equity in counselling education is exacerbated by insecurity. Regions affected by insurgency, such as the northeastern part of the country, experience significant disruption to educational programs, including counselling training programs (Akinmoladun & Olowookere, 2020). These disruptions create a disparity in access to counselling education between regions, with students in conflict zones having limited opportunities to receive proper training. Consequently, this imbalance limits the development of qualified counsellors in underserved areas, thereby widening the gap in mental health support available to those who need it the most (Okechukwu, 2019).

3. The Quality of Guidance and Counselling Education

The quality of guidance and counselling education in Nigeria is critically challenged by the pervasive insecurity affecting the nation. Insecurity has significantly impacted students' mental health, academic performance, and overall well-being, necessitating robust counselling services within schools (Ekufu & Anetoh, 2024). School counsellors play a vital role in providing emotional support and coping strategies to help students navigate their fears and anxieties related to insecurity (Yakubu & Baha, 2021). Moreover, the integration of guidance and counselling into the educational framework is essential for fostering a supportive school environment that promotes resilience among students (Ekufu&Anetoh, 2024). The Nigerian government must prioritize investment in these services to enhance their quality and accessibility, particularly in regions most affected by violence and instability (Yakubu & Baha, 2021).

Conclusion

In conclusion, insecurity in Nigeria has significantly impacted on the accessibility, equity, and quality of guidance and counselling education, particularly in conflict-affected areas. Challenges include disruptions in curriculum delivery, safety concerns, and funding limitations. However, promising solutions such as the use of online platforms, community involvement, and technology for supervision can help address these issues. These measures can enhance access to counselling services, especially in rural and insecure regions, ensuring students receive the support they need. Tackling security concerns alongside

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202533

implementing innovative approaches is essential for maintaining a resilient and high-quality counselling education system in Nigeria.

Recommendations

1. **Leverage Technology for Guidance and Counselling Services**: To address the challenges of insecurity and limited access to counselling services, the Nigerian government and educational institutions should invest in scalable online counselling platforms. The Ministry of Education could partner with tech companies to develop a national online counselling portal, such as *EduCounsellingNG*, which provides real-time support to students in conflict zones. This platform should include features such as video counselling, chatbots for immediate assistance, and downloadable resources for self-help. Additionally, the government should provide free internet access to students in underserved areas through partnerships with telecommunications companies (Federal Ministry of Education, 2023).
2. **Enhance Community-Based Guidance and Counselling Initiatives**: Schools should collaborate with local communities to establish community counselling centres in high-risk areas. These centres should be staffed by trained counsellors and community volunteers who understand the local context. In states like Borno and Zamfara, where insecurity is prevalent, community leaders and religious organizations could work with schools to create safe spaces for counselling sessions. The government should also provide training and stipends for community volunteers to ensure the sustainability of these programs (National Commission for Colleges of Education [NCCE], 2023).
3. **Allocate Adequate Funding for Counselling Programs**:
   The government should allocate at least 5% of the annual education budget to mental health and counselling services, with a specific focus on conflict-prone regions. In the 2024 budget, ₦10 billion could be earmarked for training counsellors, purchasing counselling resources, and deploying technology for remote counselling in states like Adamawa, Kaduna, and Sokoto. Additionally, international organizations such as UNICEF and the World Bank should be encouraged to provide grants specifically for mental health initiatives in Nigerian schools (Ministry of Education, 2023).
4. **Invest in Remote Supervision and Monitoring**:
   To ensure the quality of counselling services in insecure environments, the government should implement a remote supervision system using technology. A mobile app like CounsellorMonitorNG could be developed to allow supervisors to observe counselling sessions, provide feedback, and track counsellors' performance in real-time. This app could also include a database for recording student progress and identifying areas where additional support is needed. Furthermore, the government should mandate annual professional development workshops for counsellors, which can be conducted online to accommodate those in conflict zones (Nigerian Counselling Association [NCA], 2023).

References

Adebayo, F. A., &Oyedepo, O. S. (2020). Assessing the role of security measures in the protection of educational institutions in northern Nigeria. *Nigerian Journal of Educational Administration*, 28(3), 33-45.

Adebayo, S. A. (2019). The impact of financial constraints on guidance and counselling in Nigerian secondary schools. *African Journal of Educational Management*, 14(1), 45-56.

Afolabi, A. O., & Adebayo, O. A. (2019). The role of guidance and counselling in enhancing career development among Nigerian students. *Journal of Educational Research*, 11(3), 45-56.

Afolabi, O. E., & Adebayo, D. O. (2019). Career development theories and their relevance to career counselling in Nigeria. *Journal of Educational and Social Research, 9*(3), 123-130. https://doi.org/10.2478/jesr-2019-0032

Agbu, O. (2019). The impact of insecurity on education in Nigeria. *Journal of African Studies*, 15(2), 78-94.

Akinmoladun, S. O., &Olowookere, O. O. (2020). Challenges of guidance and counselling services in Nigeria amidst insecurity. *Journal of Educational and Social Research*, 10(3), 78-88.

Ekufu, R. N., &Anetoh, N. J. (2024). Role of secondary school counsellors in addressing insecurity-related issues among Nigerian students. Journal of Educational Research, 9(1),6-15.

Eze, C. O. (2021). The role of school counsellors in providing mental health support in Nigeria during times of insecurity. *International Journal of Counselling and Development*, 23(2), 112-125.

Fagbemi, O. T. (2020). Security concerns and their effect on student engagement in counselling programs in northern Nigeria. *Journal of Educational Psychology*, 28(1), 99-110.

Federal Ministry of Education. (2023). *National policy on the integration of technology in education*. Abuja, Nigeria: Government Press.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202533

Global Coalition to Protect Education from Attack [GCPEA]. (2023). *Education under attack 2023: Nigeria*. https://protectingeducation.org

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*(4), 370-396. https://doi.org/10.1037/h0054346

Mustapha, S., & Ibrahim, M. (2021). Banditry and its effects on education in Nigeria: A study of the northwest region. *Education and Society Review*, 9(1), 102-118.

National Commission for Colleges of Education [NCCE]. (2023). *Community-based counselling initiatives in Nigeria: A framework for implementation*. Abuja, Nigeria: NCCE Publications.

Nigerian Counselling Association [NCA]. (2023). *Standards for remote supervision and monitoring of counselling services*. Lagos, Nigeria: NCA Publications.

Ojo, M. O., &Eze, U. C. (2020). Reallocation of educational funds in response to security challenges in Nigerian schools. *Educational Policy and Administration Review*, 6(2), 65-75.

Ojo, M. O., &Eze, U. C. (2020). Reallocation of educational funds in response to security challenges in Nigerian schools. *Educational Policy and Administration Review*, 6(2), 65-75.

Okechukwu, N. (2019). Financial constraints and the delivery of guidance and counselling services in Nigerian schools. *African Journal of Educational Administration*, 22(1), 77-92.

Okunola, S. A., & Ayodele, K. O. (2019). The challenges of implementing guidance and counselling in Nigerian schools amidst the rise in insecurity. *Journal of Psychological Studies*, 17(4), 207-220.

Olayemi, A. A. (2017). The role of guidance and counselling in promoting student discipline in Nigerian secondary schools. *Journal of Education and Practice, 8*(6), 60-65.

Olayemi, O. (2017). The significance of guidance and counselling in Nigerian schools. *International Journal of Educational Development*, 13(1), 34-42.

Pate, U. (2018). Boko Haram insurgency and its impact on education in Nigeria. *International Journal of Conflict Studies*, 11(4), 56-72.

Super, D. E. (1957). *The psychology of careers: An introduction to vocational development*. Harper & Row.

UNICEF. (2022). *Nigeria: 10.5 million children out of school*. https://www.unicef.org/nigeria

Yakubu, A. P., & Baha, W. M. (2021). The use of guidance and counselling services to minimize insecurity in Nigeria. Journal of Arts and Education, 8(2), 23-31.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202534

Perception of Teachers on Integration of Indigenous Languages for Basic Science and Mathematics Teaching in Niger State, Nigeria

AKPOKIERE, Roseline Ugbede[1]
akporose1@yahoo.com

NIYI, Olorunsola Oriola[2]
s.niyi@fcekg.edu.ng, niyisola@gmail.com

SALIHU, Hassan[3]
hassansalihu927@gmail.com

[1]Department of Chemistry, Federal University of Education, Kontagora, Niger State.
[2]Department of Mathematics, Federal University of Education Kontagora, Niger State.
[3]Department of Hausa, Federal University of Education Kontagora, Niger State

Abstract
This study explores the perceptions of lower basic teachers in Niger State, Nigeria, regarding the use of indigenous languages in teaching basic science and mathematics, with a focus on variations based on location, gender, and school type. A descriptive research design was employed, and data were collected using the "Indigenous Language for Teaching Lower Basic Science & Mathematics Questionnaire (ILTLSMQ)" and validity was established through consultation with experts, while reliability was verified through a pilot study, resulting in a Cronbach's alpha coefficient of 0.88. The instrument was administered to 383 teachers across the state. The findings revealed no significant differences in perceptions between urban and rural teachers or between male and female teachers. However, a significant difference was observed between public and private school teachers, with public school teachers showing greater acceptance of indigenous language use. Recommendations include developing clear policies, providing teacher training, adapting curricula, and bridging the gap between public and private schools to promote the use of indigenous languages in education. These findings underscore the need for targeted interventions to enhance the integration of indigenous languages in teaching, particularly in private schools, to improve learning outcomes in basic science and mathematics.
Keywords: Teachers, Indigenous Language, Basic Science, Mathematics

Introduction
Indigenous languages play a crucial role in preserving cultural identity and enhancing comprehension, particularly in the early stages of education. Tsaure and Sani (2024) emphasize that using indigenous languages as a medium of instruction in Nigerian primary schools can significantly improve learners' understanding and retention of concepts, especially in science and mathematics. The role of indigenous languages in education has been a subject of global discourse, particularly in multilingual societies where language barriers may affect learning outcomes. In Nigeria, where multiple indigenous languages coexist with English as the official language of instruction, concerns have been raised regarding the effectiveness of using indigenous languages in teaching core subjects such as basic science and mathematics. The National Policy on Education (FRN, 2013) stipulates that the first three years of basic education should be conducted in the mother tongue or the language of the local community, with every child required to learn one Nigerian language. Fafunwa et al. (1989) reinforced this stance, advocating for mother tongue instruction during the first 12 years of a child's life. Although this policy is longstanding, it continues to spark debate. Nigeria adopted a colonial education system from the British, which established English as the primary medium of instruction at all levels. Fafunwa et al. (1998) linked the persistence of English as the official language to a colonial mentality, arguing that early education in a child's mother tongue enhances long-term memory retention.

Basic science and mathematics are foundational subjects that play a vital role in personal, societal, and global development. They equip individuals with critical thinking, problem-solving, and analytical skills, which are essential for navigating everyday life and addressing complex challenges. These subjects also serve as the backbone of innovation and technological

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202534

advancement, driving economic growth and enabling breakthroughs in fields like healthcare, renewable energy, and artificial intelligence (Akpokiere, Arowolo, Dangana, Niyi, & Haruna, 2018). Beyond their practical applications, science and mathematics promote scientific literacy, helping individuals make informed decisions about health, technology, and environmental issues. Ensuring access to quality science and mathematics education is a matter of equity and inclusion. It empowers marginalized groups, including girls and underrepresented communities, to pursue opportunities in STEM fields, thereby reducing disparities and promoting social justice. The integration of indigenous languages in the teaching of mathematics and science has been proposed as a strategy to improve conceptual understanding and bridge learning gaps, particularly among early learners (Golafshani, 2023; Ntuli & Mudau, 2024). Several studies have highlighted the potential benefits of teaching mathematics and science using indigenous languages. Nahole and Haimbodi (2022) examined the challenges faced by pre-service teachers in multilingual classrooms and found that students' comprehension improved when instruction was delivered in a familiar language. Similarly, Oginni and Owolabi (2013) noted that primary school pupils performed better in mathematics when taught in their mother tongue compared to when English was used as the medium of instruction. These findings align with Paulo Freire's critical pedagogy, which emphasizes the importance of culturally relevant teaching practices to enhance student engagement and learning outcomes (Nugraha, Wibowo, & Hendrawan, 2024).

The study was limited to Niger State is the largest state in Nigeria's North-Central region with a total land area of about 76,363 square kilometers. With more than 20 ethnic groups, including the Fulani, Hausa, Gbagyi, and Nupe, the state boasts a rich cultural diversity that is reflected in its vibrant languages and customs. There are many obstacles to education in Niger State, especially in the areas of infrastructure, quality, and accessibility. Over 25,000 basic education teachers serve a sizable population of primary and secondary school pupils in the state, according to the Niger State Universal Basic Education Board (2021). However, the state like several others is faced with a high rate of out-of-school children in Nigeria, with an estimated 1 million children out of school. The use of indigenous languages in teaching, particularly at the lower basic level, has been explored as a way to improve learning outcomes, as highlighted in recent studies. Despite these advantages, the implementation of indigenous language instruction in Nigerian primary schools has encountered several challenges. Niyi, Akpokiere, and Salihu (2024) identified inadequate teacher training, lack of instructional materials, and resistance from stakeholders as significant barriers to effective implementation. Additionally, Ojoo and Moyi (2022) noted that the policy environment in Nigeria has not fully embraced the use of indigenous languages in teaching science and technology, particularly in the North-East and North-West regions. A study by Tsaure and Sani (2024) further emphasized the significance of indigenous languages in primary education but pointed out the need for systematic curriculum development and government support.

In Niger State, where this study is focused, previous research by Niyi, Job, Alagbe, and Audu (2018) explored teachers' perceptions of using the Hausa language for mathematics instruction and found mixed reactions. While some teachers acknowledged its effectiveness in improving student comprehension, others expressed concerns about the potential limitations in preparing students for higher education, where English remains the primary medium of instruction. Similarly, Omachonu and Dalhatu (2018) examined the linguistic landscape of North Central Nigeria and highlighted the diversity of indigenous languages spoken in the region, making uniform language policies difficult to implement. Oginni and Owolabi (2013) found that primary school pupils performed better in mathematics when taught in their mother tongue compared to a foreign language. Despite the potential benefits, the implementation of indigenous language policies in Nigeria faces numerous challenges. Niyi, et al. (2024) highlight the structural, logistical, and attitudinal barriers to integrating indigenous languages into the teaching of basic science and mathematics in Niger State. The geographical and institutional context of education significantly influences teaching practices and outcomes. Ojoo and Moyi (2022) examined the use of mother tongue in teaching science and technology in Nigeria's North-East and North-West zones, revealing regional disparities in implementation and acceptance. Gender is another critical factor that influences educational practices and outcomes. This study investigates whether male and female teachers differ in their perceptions of using indigenous languages in teaching basic science and mathematics. Understanding these gender dynamics is essential for developing inclusive and equitable educational policies.

The findings of this study will have significant implications for policymakers, curriculum developers, and educators. By identifying the factors that influence teachers' perceptions, the study will provide evidence-based recommendations for promoting the use of indigenous languages in basic education. This is particularly relevant in Niger State, where the implementation of indigenous language policies remains a work in progress (Niyi et al., 2024). This study is justified by the need to understand teachers' perceptions of indigenous language use in basic science and mathematics education, considering

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202534

the interplay of location, school type, and gender. By addressing these factors, the study contributes to the broader discourse on improving educational outcomes and preserving cultural heritage in Nigeria.

The use of indigenous languages as a medium of instruction in basic education has been widely advocated as a means to improve learning outcomes, particularly in science and mathematics. However, in Nigeria, and specifically in Niger State, the implementation of indigenous language policies in teaching these subjects remains inconsistent and faces significant challenges. Research has shown that the use of mother tongue in education can positively impact students' academic performance (Oginni & Owolabi, 2013). However, the successful integration of indigenous languages into the curriculum depends largely on teachers' attitudes and perceptions, as they are the primary implementers of educational policies. Studies such as those by Tsaure and Sani (2024) and (Niyi et al., 2024) have highlighted the significance of indigenous languages in education and the challenges associated with their implementation. Yet, there is limited empirical evidence on how teachers in Niger State perceive the use of indigenous languages in teaching basic science and mathematics, and how these perceptions vary across different contexts.

Despite the potential benefits of using indigenous languages to enhance comprehension and cultural relevance, there is a lack of understanding regarding how teachers perceive this approach, particularly when considering factors such as location (urban vs. rural), school type (public vs. private), and gender (male vs. female teachers). These gaps in understanding hinder the development of effective strategies to promote the use of indigenous languages in education. The findings will contribute to the development of targeted interventions and policies to support the effective use of indigenous languages in basic education, ultimately improving learning outcomes in science and mathematics in Niger State, Nigeria.

Research Questions

Therefore, this study seeks to address the following questions:

1. How does lower basic teachers' perception of using indigenous languages in teaching basic science and mathematics differ by school type (public/private)?
2. How does lower basic teachers' perception of using indigenous languages in teaching basic science and mathematics differ by gender?
3. How does lower basic teachers' perception of using indigenous languages in teaching basic science and mathematics differ by location (urban/rural)?

Research hypothesis

1. There is no significant difference in the perception of lower basic teachers in urban and rural areas of Niger State regarding the use of indigenous languages to teach basic science and mathematics.
2. There is no significant difference in the perception of lower basic male and female teachers in Niger State regarding the use of indigenous languages to teach basic science and mathematics.
3. There is no significant difference in the perception of lower basic public and private teachers in Niger State regarding the use of indigenous languages to teach basic science and mathematics.

Methodology

The researchers employed a descriptive research design to investigate the challenges and prospects of using indigenous languages for teaching lower basic science and mathematics in Niger State. The study involved distributing a structured questionnaire, the "Indigenous Language for Teaching Lower Basic Science & Mathematics Questionnaire (ILTLSMQ)," to lower basic school teachers (primary 1-3) across the three senatorial zones of Niger State. A sample size of 383 teachers was selected using stratified random sampling, based on Krejcie and Morgan's (1970) formula, to ensure broad representation. The questionnaire, divided into four sections (knowledge, attitude, challenges, and prospects), used a four-point Likert scale to measure teachers' perceptions, attitudes, and experiences. Validity was ensured through literature review and expert input, while reliability was confirmed via a pilot study using Cronbach's alpha, yielding a reliability coefficient of 0.88. Ethical considerations, including informed consent, confidentiality, and the right to withdraw, were observed. Data collection and analysis involved distributing over 400 (383 returned) questionnaires, with the assistance of four trained research assistants, and analysing the data using inferential statistics, including a t-test to examine the research hypothesis.

Presentation of Results

Research Question 1

How does lower basic teachers' perception of using indigenous languages in teaching basic science and mathematics differ by school type (public/private)?

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202534

Table 1: Mean and Standard Deviation Based on School Type

Variables	N	Mean	SD
Public	187	76.27	6.78
Private	196	73.73	9.29

Table 1 reveals notable differences in how public and private lower-basic school teachers perceive the use of indigenous languages in teaching basic science and mathematics. On average, public-school teachers report a more favourable attitude, with a mean perception score of 76.27, compared to private school teachers, who average 73.73. This suggests that public school teachers are generally more supportive of incorporating indigenous languages into STEM education. The responses from public school teachers show less variability, with a standard deviation of 6.78, indicating greater consensus among them. In contrast, private school teachers exhibit more diverse opinions, as reflected in their higher standard deviation of 9.29. This wider spread in responses suggests that while some private school teachers may strongly support the use of indigenous languages, others may be more hesitant or opposed.

Research Question 2

How does lower basic teachers' perception of using indigenous languages in teaching basic science and mathematics differ by gender?

Table 2: Mean and Standard Deviation Based on Gender

Variables	N	mean	SD
Male	156	75.17	9.49
Female	227	74.69	7.41

The data reveals interesting similarities and differences between male and female teachers' perceptions regarding the use of indigenous languages in basic science and mathematics education. While both groups show generally favorable attitudes, with male teachers averaging a score of 75.17 and female teachers averaging 74.69, this minor difference suggests gender plays little role in determining overall support for indigenous language integration in STEM subjects. Male teachers demonstrate significantly greater variability in their perceptions, as evidenced by their higher standard deviation of 9.49 compared to female teachers' 7.41. This wider range of opinions among male educators indicates that while some strongly advocate for indigenous language use, others remain more hesitant or opposed. In contrast, female teachers' responses cluster more tightly around the average, suggesting greater consensus and uniformity in their views.

Research Question 3

How does lower basic teachers' perception of using indigenous languages in teaching basic science and mathematics differ by location (urban/rural)?

Table 3: Mean and Standard Deviation Based on School Location

Variables	N	Mean	SD
Urban	201	75.30	7.85
Rural	182	74.98	8.71

The results reveal remarkably similar attitudes between the urban and rural teachers, with only marginal differences in both average perceptions and response variability. Urban teachers demonstrate a mean perception score of 75.30, while their rural counterparts average 74.98 - a negligible difference of just 0.32 points. This near-identical average suggests that location has minimal impact on teachers' overall stance toward incorporating indigenous languages in STEM education. Both groups show moderately positive attitudes, indicating broad acceptance of this pedagogical approach regardless of school setting. A slightly more pronounced difference emerges in the standard deviation values, with urban teachers showing somewhat more consistent responses (SD = 7.85) compared to rural educators (SD = 8.71). This pattern suggests that while urban teachers' opinions tend to cluster more tightly around the mean, rural teachers exhibit marginally greater diversity in their views. The broader range of responses among rural educators might reflect varying local language policies, differing community attitudes, or the unique challenges faced by schools in remote areas.

Hypothesis 1

There is no significant difference in the perception of lower basic teachers in urban and rural areas of Niger State regarding the use of indigenous languages to teach basic science and mathematics.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202534

Table 4: t-test analysis of lower basic teachers in urban and rural areas

Variables	N	X	SD	Df	*t-value*	*p-value*
Urban	201	75.30	7.8540	381	0.4231	0.6725
Rural	182	74.98	8.7137			

$\alpha < .05$

Table 4 shows the independent samples t-test was conducted to compare the means of urban and rural teachers. The results indicated that there was no statistically significant difference between the groups, $t(381) = 0.42$, $p = .673$. The mean difference between the groups was 0.36 (95% CI [-1.31, 2.03]). This means that there is no sufficient evidence to reject the null hypothesis. In other words, there is no significant difference in the perceptions of teachers from urban and rural areas on teaching basic science and mathematics using indigenous languages.

Hypothesis 2

There is no significant difference in the perception of lower basic male and female teachers in Niger State regarding the use of indigenous languages to teach basic science and mathematics.

Table 5: T-test analysis of lower basic teachers in male and female

Variables	N	$\bar{x}$	SD	Df	*t*-value	*p*-value
Male	156	75.17	9.49			0.579
Female	227	74.69	7.41	381	0.5548	

$\alpha < .05$

The independent samples t-test conducted to compare the means of male and female teachers is presented in Table 5. The analysis revealed that there was no statistically significant difference between the two groups, $t(381) = 0.55$, $p = .579$. The mean difference between the groups was 0.48 (95% CI [-1.22, 2.18]). There is therefore, no significant difference in the perceptions of male and female teachers on teaching basic science and mathematics using indigenous languages.

Hypothesis 3

There is no significant difference in the perception of lower basic public and private teachers in Niger State regarding the use of indigenous languages to teach basic science and mathematics.

Table 6: t-test analysis of lower basic public and private school teachers

Variation	N	Mean	SD	DF	*t-value*	*p-value*
Public	187	76.27	6.7756	381	3.0498	0.0025
Private	196	73.73	9.2854			

$\alpha < .05$

Table 6 shows the result of independent samples t-test conducted to compare the means of lower basic public and private school teachers. The analysis yielded a significant result, $t(381) = 3.05$, $p = 0.002$, indicating a statistically significant difference between the two groups. The standard error of the difference was 0.834 (95% CI [-4.18, -0.90]). Hence, there is significant difference in the perceptions of public and private school teachers on teaching basic science and mathematics using indigenous languages.

Discussion of Findings

This study examined the perceptions of lower basic teachers in Niger State regarding the use of indigenous languages in teaching basic science and mathematics, comparing responses based on location (urban vs. rural), gender (male vs. female), and school type (public vs. private). The result suggests that teachers in both urban and rural areas may share similar experiences with language barriers and student comprehension challenges. It may also indicate a widespread recognition of the benefits or limitations of using indigenous languages in instruction, regardless of location. Policymakers should consider implementing universal training programs that address these common perceptions across all regions.

The consistency in perception across gender lines may indicate that professional experiences and exposure to indigenous language teaching are more influential than gender in shaping opinions. This finding suggests that any strategies or policies aimed at promoting indigenous language instruction do not need to be gender-specific but rather focus on universal teacher

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202534

training and curriculum adaptation. The significant difference in perception between public and private school teachers suggests that institutional culture and policies play a major role in shaping attitudes toward indigenous language instruction. Public schools may have more government-driven policies promoting local language use, while private schools may prioritize English or other languages perceived as globally competitive. This highlights the need for a balanced approach that accommodates both perspectives, ensuring that students in all schools' benefit from language-inclusive instruction while maintaining global competitiveness. The study confirms that teachers' perceptions regarding the use of indigenous languages in teaching basic science and mathematics do not differ significantly based on location or gender. However, school type significantly affects teachers' perceptions, with public school teachers showing greater acceptance of indigenous language use compared to private school teachers.

Conclusion

The study indicated that while urban-rural location and gender do not significantly influence teachers' perceptions of using indigenous languages in teaching basic science and mathematics, the type of school does play a significant role. Public school teachers are more likely to support the use of indigenous languages compared to private school teachers. These results underscore the need for targeted interventions to address the disparities between public and private schools, particularly in promoting the adoption of indigenous languages in private school settings. The findings highlight the importance of considering contextual factors when designing and implementing language policies in education.

Recommendations

Based on the findings and insights from this study, the following recommendations are made:

1. The government and educational stakeholders should develop a clear policy on the use of indigenous languages in teaching basic science and mathematics, ensuring consistency across both public and private schools.
2. Regular workshops and training sessions should be organized to enhance teachers' ability to effectively use indigenous languages in instruction. This should include both theoretical and practical aspects of language integration.
3. Educational authorities should review and adapt the curriculum to incorporate indigenous languages where necessary, ensuring that instructional materials are available in both indigenous and official languages.
4. Efforts should be made to bridge the gap between public and private institutions regarding language instruction. This can be achieved through knowledge-sharing, collaborative programs, and policy adjustments.
5. Schools should be equipped with teaching materials, textbooks, and digital content that support the use of indigenous languages in basic science and mathematics.

Acknowledgements

We wish to express gratitude to TETFUND for providing sponsorship for this research work.

References

Awoyale, O. & Niyi, O. O. (2023). Assessment of mathematics learning on entrepreneurial skills development among secondary school students in kontagora local government area, Niger state. *Zamfara International Journal of Education (ZIJE) 3*(6), 54 – 61. https://doi.org/10.5281/zenodo.10666729

Fafunwa, A. B., Mitchel, J. I., & Yoloye, J. A. F. (1989). *Educational research project (1970-1976).* University Press Limited.

Federal Republic of Nigeria. (2013). National policy on education. NERDC Press.

Golafshani, N. (2023). Teaching mathematics to all learners by tapping into indigenous legends: A pathway towards inclusive education. *Journal of Global Education and Research, 7*(2), 99-115. https://doi.org/10.5038/2577-509X.7.2.1224

Nahole, M., & Haimbodi, F. M. (2022). Pre-service teachers' mathematical concepts in indigenous languages: Challenges encountered in multilingual classrooms, Rundu urban, Namibia. *Journal of Research and Advances in* Mathematics *Education, 7*(1), 36-45. https://doi.org/10.23917/jramathedu.v7i1.15482

Niger State Universal Basic Education Board (NSUBEB) (2021). Distribution of primary schools in Niger State and staff strength as at 2021. NSUBEB MIS Unit Minna.

Niyi, O. O., Job, S. J., Alagbe, S. O., & Audu, A. O. (2018). Teaching primary school mathematics using Hausa language as perceived by teachers in Kontagora L.G.A. of Niger State. Kontagora Journal of Science and Technology, 13(1).

Niyi, O. O., Akpokiere, R. U., & Salihu, H. (2024). Implementation of Indigenous Language Policy for Basic Science and Mathematics in Niger State, Nigeria: Challenges and Prospects. *British Journal of Psychology Research, 12*(3), 23–31. https://doi.org/10.37745/bjpr.2013/vol12n32331

Nugraha, A. E., Wibowo, D., & Hendrawan, B. (2024). Paulo Freire's critical pedagogy analysis of educational transformation. *MSJ: Majority Science Journal, 2*(2), 220-228. https://doi.org/10.61942/msj.v2i2.157

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202534

Ntuli, T. G., & Mudau, A. V. (2024). Influence of an African indigenous language on classroom interactions and discourses. *Education Sciences*, 14, 684. https://doi.org/10.3390/educsci14070684

Oginni, O. I., & Owolabi, O. T. (2013). Effect of mother tongue and mathematical language on primary school pupils' performance in mathematics. *Journal of Emerging Trends in Educational Research and Policy Studies, 4*(3), 542–546.

Ojoo, S. Y., & Moyi, M. I. (2022). Using mother tongue in teaching of science and technology: Reference to the North-East and North-West geo-political zones, Nigeria. *Scholar International Journal of Linguistics and Literature, 5*(4), 123–129.

Omachonu, G. S., & Dalhatu, A. M. (2018). The languages of the North Central geopolitical zone of Nigeria. *Journal of the Linguistic* Association *of Nigeria*. https://jolan.com.ng/index.php/home/article/view/42

Tsaure, M., & Sani, A. (2024). Indigenous languages as medium of instruction in Nigerian primary schools: Significance and implications. *Tasambo Journal of Language, Literature, and Culture, 3*, 32–39. https://doi.org/10.36349/tjllc.2024.v03i01.004

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202535

Access, Equity and Quality of Education in the Face of Insecurity in Nigeria: Implications on School Administration

NATHANIEL, Oyedokun[1]
nathanieloyedokun@gmail.com,
08037790639

IMRANA, S. Pawa[1]
Imranaspawa@gmail.com,
07032607838

[1]Department of Educational Foundations, Faculty of Education, Federal University Gusau Zamfara State, Nigeria

Abstract
Over the years, Nigerian Educational system has significantly aligned, improved and enabled individuals by providing opportunities for learning and growth through basic, tertiary and special education. However, the emergence and lingering of the bedeviling insecurity in Nigeria, consequentially, has retarded the accessibility, equity and quality of Basic, Tertiary and Special education. Insecurity has plunged Nigeria into tragedies resulting from the activities of terrorism and insurgency, banditry, kidnapping, ethno-religious conflict, farmer-herder clashes, militancy in Niger Delta, organized crime, abductions, food insecurity, etc., and these problems has been causative of internal displacement of staff and students, poor academic performance, teacher shortages, destruction of educational facilities, close of educational institutions, economic hardship among other tragedies. This paper explores how insecurity affects access, equity, and quality in education (Basic, Tertiary and Special), and examines the implications on school administration hence, recommendations to improving on situation based on findings. This paper adopts secondary data (published and unpublished papers) to provide empirical facts concerning highlighted points. The secondary data were sourced from journals online and printed materials. Similarly, the recommendations include: strengthening schools security protection, promoting alternative education, engaging communities, formulation and implementation of developmental policies, addressing the porosity of borders, ensuring the effectiveness of the rule of law against perpetrators irrespective of social or political class.
Key words: Insecurity, Education.

INTRODUCTION
The instrumentality of education towards the attainment of all-sphere development is an unavoidable trajectory to any development-seeking country. Education in Nigeria, over a decade has been on gradual degradation owing to challenges emanating from insecurity, this in turn has constituted a formidable threat to the nation's future. The promise of education, which is a mandate to opportunities, a catalyst for progress and foundation for a brighter future is under assault in Nigeria. Hence, the access to, equity and the quality of education in Nigeria has been attenuated deeply as a result of the lingering insecurity; particularly, in the northern region where the adverse effect is more devastating. According to premium times (2024) the National Bureau Of statistics (NBS) report (May, 2023-April, 2024) documented 614,937 fatalities nationwide due to insecurity. The northwest region recorded the highest number of deaths at 206,030, followed by the North-East with 188,992. Additionally, 2,235,934 individuals were kidnapped during this period with a total ransom of approximately ₦2.2 trillion paid. Similarly, Placng.org (2024) highlighted that the widespread of kidnapping in the country has seen pupils, teachers and a school bus driver abducted in Ekiti state, A monarch was killed and his wife abducted in Kwara State, within one week. Report surfaced of fresh attacks in Mangu, Plateau State on Tuesday, January, 23rd in which 25 persons were killed, barely one month after no less than 195 persons were killed and over 10,000 others displaced following attacks in several communities across Bokkos, Barkin Ladi and Mangu Local Government Areas of the State on Christmas eve. There has also been reports of further attacks on communities in Benue state on January 23rd, in which 30 persons were killed. On the same day, gunmen attacked Yandaka village in Batsari Local Government of Katsina State where they killed three persons and abducted 32 others. With the occurrence and re-occurrence of the aforementioned tragedies bedeviling Nigeria; obviously, the access to education, equity and quality of education will inevitably diminish perpetually.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202535

Theoretical framework

This paper build on theory of Peace by Norweigian Sociologist called Johan Galtung in 1969. It emanated from his work titled "Violence, peace and peace Research". Galtung known as the father of peace studies developed the concept of "positive peace" and "negative peace", He famously differentiated between negative peace (absence of violence) and "positive peace" (a just and equitable society where the underlying causes of conflict are addressed). He further explained: positive peace describes a state where not only direct violence is absent, but also structural violence; meaning, it encompasses social justice, equity and well-being for all within a society. Examples of structural violence include: unequal distribution of wealth, lack of access to quality education or healthcare, discriminatory policies base on race, gender or social class. The theory is relevant to this paper because Nigeria is fraught with various violence emanating from various forms of insecurity such as: terrorism and insurgency, banditry, kidnapping, ethno-religious conflict, farmer-herder clashes, militancy in Niger Delta, organized crime etc. Therefore, to achieve positive peace, the government must address underlying structural inequalities by implementing policies that promote social justice, economic development and equal access to resources. Policies in similitude to Local Government autonomy and their implantation is key to ameliorating

Conceptual Framework

The concept of access, equity and quality in education are primitively of utmost vitality to ascertaining an inclusive and effective system. Bhola (2006) advocated that access to education is merely a matter of educational expansion, that is, seeking to bring education to as many school-aged children as possible, and in some rare cases, seeking to bring literacy or adult education to adult men and women who had been bypassed or underserved by formal school systems. Access to education in the view of Ene (2007) implies making benefits of education possible for everyone and anyone who is entitled to education to receive it (Federal Republic of Nigeria, 2013). By implication, we understand this stance as having the connotation that for access to be possible, comprehensive educational resources such as: classrooms, laboratories, teachers, instructional materials, school plants, among others, would be provided for everyone and anyone in the society without. However, equity in educational provision, unlike access to education, is determined by resource allocation and distributive efficiency (Oghenekohwo, 2010). This is premised on the fact that equity in education implies ensuring that all the segments of developing society get their "fair" share of access to whatever educational opportunities are provided. However, we are quick to query who determines the fairness and the sharing formula? To answer this query, we are convinced that the elements of exclusion may not be totally eliminated, hence, public policy instruments on educational development must be isolated from all forms of exclusion. Therefore, equity in educational provision would depicts fairness to all as it implies the provision of equal opportunities for those who are qualified to receive education (and we know that everyone is qualified, without prejudice) irrespective of circumstances of birth, ethnic group, religion and social status. Besides, Mohammed (1998) wrote that equity in education must be devoid of all forms of impediments to educational opportunities, which are not due to natural incapacities but which are the products of social exclusion, because equity sustains social justice in access to education for development.

Quality education is a multifaceted concept that encompasses various element contributing to effective learning and positive outcomes. A comprehensive literature review traces the evolution of quality education from ancient philosophical perspective to contemporary learning theories applied in digital classrooms. Balogun [2010] affirmed that education is the light, without which the world would be in darkness. This view presupposes quality of education as the basis for modernity, science and technological transformations. Onye and Anyaogu [2017] stated that quality education is the education which is relevant and adapted to the needs of the community in a complex and integrated world of living, in technological age where standard of things is set. Quality education as a process is the education that puts the learners at the center as it thrives to enable them develop and utilize their latent potentials and inherent qualities required for integrated personality to survive in constant changing world.

Basic Level of Education in Nigeria

Basic education refers to the foundational stage of formal learning, typically covering early childhood, primary, and lower secondary education. It aims to provide essential literacy, numeracy, and life skills necessary for personal development and active participation in society. Basic education systems vary worldwide but are often structured according to national education policies and international guidelines set by organizations like UNESCO and the World Bank.

Components of Basic Education

1. *Early Childhood Education (ECE):* Focuses on cognitive, social, emotional, and physical development in children aged 3-6 years. It lays the groundwork for future learning.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202535

2. *Primary Education:* Covers basic literacy, numeracy, and fundamental subjects such as science, social studies, and arts, typically for children aged 6-12 years.
3. *Lower Secondary Education:* Bridges primary education and higher levels of schooling, enhancing subject-specific knowledge, critical thinking, and life skills for adolescents aged 12-15 years.

Importance of Basic Education

i. Cognitive and Social Development: Enhances critical thinking, problem-solving, and communication skills.
ii. Economic Growth: Leads to a more skilled workforce, increasing employability and income potential.
iii. Health and Well-being: Promotes awareness of hygiene, nutrition, and basic healthcare, improving public health outcomes.
iv. Civic Engagement: Encourages democratic participation, social responsibility, and cultural understanding.

Global Frameworks and Policies

International organizations emphasize the role of basic education in sustainable development:

i. UNESCO's Education 2030 Framework for Action supports universal access to quality basic education (UNESCO, 2015).
ii. The World Bank's Education Strategy 2020 highlights investment in early learning and primary education as key to reducing poverty (World Bank, 2011).
iii. UN Sustainable Development Goal 4 (SDG 4) aims for inclusive and equitable quality education for all by 2030 (United Nations, 2015).

Tertiary Level of Education in Nigeria

Tertiary education refers to the level of education that follows secondary education and includes universities, colleges, vocational training institutions, and other post-secondary education providers. It plays a crucial role in developing advanced knowledge, skills, and competencies needed for various professions and personal development.

Key Aspects of Tertiary Education

1. ***Types of Institutions***

i. Universities: Offer undergraduate and postgraduate degrees, emphasizing research and theoretical knowledge.
ii. Colleges: Provide specialized training and education, often at the undergraduate level.
iii. Technical and Vocational Education and Training (TVET) Institutions: Focus on practical skills for specific careers, such as engineering, healthcare, and information technology.

2. ***Degrees and Certifications***

i. Undergraduate Degrees: Bachelor's degrees (e.g., BA, BSc) typically take 3–6years to complete.
ii. Postgraduate Degrees: Master's (e.g., MA, MSc, MBA) and doctoral degrees (PhD) focus on advanced research and specialization.
iii. Diplomas and Certificates: Shorter programs that provide specialized training in various fields.

3. ***Role in Economic and Social Development***

i. Higher education contributes to economic growth by fostering innovation and developing a skilled workforce.
ii. It promotes social mobility and reduces inequality by providing individuals with greater career opportunities.
iii. Universities serve as centers for research, advancing scientific and technological knowledge.

4. ***Global Trends in Tertiary Education***

i. Massification: Increasing enrolment due to the rising demand for higher education.
ii. Digital Transformation: Growth of online and blended learning models.
iii. Internationalization: Increased student mobility and global collaboration among institutions.

Special Education in Nigeria

Special education refers to customized instructional programs designed to meet the unique needs of students with disabilities. These programs aim to provide equitable educational opportunities by offering specialized teaching methods, assistive technologies, and individualized support services.

Key Components of Special Education

1. *Individualized Education Program (IEP)*

i. A legally mandated document in many countries (e.g., U.S., under the Individuals with Disabilities Education Act, IDEA) outlining tailored educational goals and support services.
ii. Developed collaboratively by educators, specialists, parents, and sometimes the student.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202535

2. ***Inclusion and Least Restrictive Environment (LRE)***

i. The principle of integrating students with disabilities into general education settings whenever possible.
ii. Supported by research advocating for inclusive education's positive effects on academic and social outcomes.

3. ***Disability Categories***

i. Includes learning disabilities (e.g., dyslexia), intellectual disabilities, autism spectrum disorder (ASD), emotional and behavioural disorders, and sensory impairments (e.g., blindness, deafness).

4. ***Teaching Strategies and Assistive Technology***

i. Special education employs differentiated instruction, multimodal teaching approaches, and technology-assisted learning (e.g., text-to-speech software, adaptive communication devices).

5. ***Legal and Ethical Considerations***

i. Governed by laws such as IDEA (U.S.), the Education for All Handicapped Children Act (EHA), and international frameworks like the United Nations' Convention on the Rights of Persons with Disabilities (CRPD).

6. ***Challenges in Special Education***

i. Issues include lack of resources, teacher training deficits, disparities in service availability, and debates over the effectiveness of inclusion versus specialized settings.

Impact of Insecurity on Access, Equity and Quality of Education in Nigeria

Education is a fundamental right and a key driver of social and economic development. However, insecurity—arising from armed conflicts, terrorism, kidnapping, gang violence, and other threats—poses a major challenge to access, equity, and quality in basic, tertiary, and special education. Schools, students, teachers, and administrators are increasingly vulnerable to attacks, leading to disrupted learning and a decline in educational outcomes.

1. ***impact of Insecurity on Access to Education in Nigeria***

Access to education is significantly hindered in regions affected by insecurity. The following are some key issues:

i. School Closures: Fear of attacks forces schools to shut down, particularly in conflict-prone areas.
ii. Forced Displacement: Insecurity leads to displacement of students and teachers, reducing school enrolment.
iii. Economic Hardship: Families in insecure areas struggle financially, leading to increased drop-out rates as children are forced into child labour.
iv. Restricted Movement: Curfews, roadblocks, and violence make it difficult for students and teachers to reach school.

2. ***Impact of Insecurity on Equity in Nigerian Educational System***

Equity in education ensures that all students, regardless of background, have equal opportunities. Insecurity exacerbates inequalities by disproportionately affecting marginalized communities.

i. Gender Disparities: Girls are often the first to be withdrawn from school in unsafe environments due to the risk of sexual violence or cultural pressures.
ii. Rural vs. Urban Divide: Rural areas, which often have fewer security resources, suffer more from school closures and teacher shortages.
iii. Special Needs Students: Those requiring specialized learning environments face exclusion when schools are attacked or underfunded due to insecurity.

3. ***Impact of Insecurity on Quality of Education in Nigeria***

Even when students can access schools, the quality of education is compromised in insecure environments.

i. Teacher Shortages: Many educators flee conflict zones, leading to reliance on underqualified staff.
ii. Psychological Trauma: Students exposed to violence may suffer from trauma, affecting concentration and learning outcomes.
iii. Lack of Infrastructure: Schools in insecure areas are often destroyed, looted, or repurposed for military use, affecting learning conditions.

Implications of Insecurity on School Administration

The lingering insecurity in Nigeria has a devastating effect. However, the implications on school administration includes:

1. **Reduction of Teachers**: The insecurity problem facing Nigeria has resulted to the death of many resourceful professional teachers. Muhammed and Ogunode (2022) acknowledge that insecurity has led to the death of a teacher at higher institutions. Garba, Ogunode, Musa, and Ahmed (2022) conclude that the effects of insecurity on tertiary education in the Northeast political zone in Nigeria are that it has led to a reduction of manpower in the various institutions in the zone. Many academic and non-academic staff have been killed by bandits and insurgents. Garba,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202535

Ogunode, Musa & Ahmed (2022), Ogunode (2020), Ogunode and Musa (2020), Ogunode and Ahaotu (2020) and Needs (2014) have agreed that many higher institutions staff in the country are been killed by insurgents.

2. **Poor Quality of Education:** The poor quality of education in some parts of the country can be associated to insecurity problems. The insecurity menace has affected the school calendar and resulted to inability to complete their scheme of works and syllables. The implication is poor performance in examinations. Ogunode and Godwin (2021) submit that poor quality of education is another effect of the continuous closure of the school in Northern Nigeria. Quality of education is achieved when all the educational resources are used effectively utilized. School time and covering of the expected scheme of work also is very paramount. The continuous closure of the school in Northern Nigeria as a result of attacks by Banditry and insurgence is not allowing students and teachers to cover the designed scheme of work, and when this happens, it will result in poor quality education.
3. **Ineffective School Supervision:** Insecurity challenges in Nigeria affects school supervision. The essential role of school supervision as key to achieving quality education has been jeopardized by insecurity bedevilling country. supervisors and inspectors can no longer go for supervision of schools as planned due to the insecurity problems in the country. Many of them are afraid of being killed or kidnapped by bandits or Boko Haram members. Ogunode and Adanna (2022) submit that insecurity in Nigeria is preventing the effective supervision of higher institutions. Nigerian roads are not safe from bandits and criminals who are specialized in kidnapping people for ransom. similarly, these perpetrators keep attacking higher institutions with a resultant effect of school closure which in turn affects the academic program and accreditation program of the higher institutions. Ogunode and Adanna (2022) conclude by saying insecurity, Inadequate funding, shortage of personnel, inadequate transportation facilities, opposition from Labour unions, limited offices, strike actions, inadequate supervision materials, and corruption were concluded as the challenges militating against effective supervision of higher institutions in Nigeria.
4. **Death of Students:** The insecurity problem facing Nigeria has led to the death of many students in Nigerian schools. At the basic level, Ogunode (2020) notes that many primary school students have lost their lives while other students were kidnapped and later released. At the secondary school level, Ogunode (2021) and Mohammed & Ogunode (2022) submit that many secondary school students have been killed and kidnapped by bandits and Boko Haram members. At higher institutions, Ogunode and Musa (2020) note that many students and academic staff of higher institutions have been attacked at different times resulting in their death on campus. The higher institutions' environment is unsafe for students and lecturers. Ogunode, et al. observed that the killing of the academic staff of tertiary institutions by bandits and insurgents are inimical to the development of higher education and has the potential of reducing the strength of academics across the country. The intermittent killing of academic staff across the country is detrimental to the development of higher education. The effects are substandard teaching, brain drain, and poor quality of education.
5. **Reduction in Private Investment in Education** Insecurity faced by the country is preventing investment in the development of educational institutions in the country and in turn disrupt school administration because, such investment, if embarked upon will be destroyed by the insurgents attacking public and private educational institutions in the country. The government and some state governments have resolved not to embark on infrastructural development of educational institutions for now until when the security issues are over. These actions on a perpetual note, has attributed stoppage and prevent investment in education. Similarly, many private sectors too are discouraged on establishing private schools because of the fear of attacks. Oluyomi, & Grace, (2016) submitted that the Child's learning is affected in that, he/she has limited number of schools to choose from. Government and private owners are unable to open new schools.

Suggestions

Following the numerous challenges of insecurity and its various devastating effects explored in this paper, the following recommendation were made:

i. **Security Sector Reform**: The Nigerian government has initiated security sector reforms, including training programme and equipment upgrades for security forces. Progress has however, been slow and tainted with issues such as corruption and allegations of human rights abuse which continue to undermine the effectiveness of security forces. There is an urgent need to accelerate the implementation of reforms, prioritize anti-corruption measures, and ensure adequate funding and oversight to enhance the professionalism and accountability of security agencies.
ii. **Addressing root causes**: The government should focus its efforts on addressing the underlying drivers of insecurity in Nigeria by adopting initiatives aimed at poverty reduction. School administrators should deploy ICT facilities like
iii. Circuit Television (CCTV), surveillance cameras, Detecting Devices, Geographical Positioning System (GPS)-

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202535

enables devices, Satellite Imagery, Automated Personal Data Bank, Data Mining, and Database Tracking Systems.

1. **Policy formulation and implementation**: Federal government should take seriously, the formulation and implementation of more developmental policies of multiplier effect, such as Local government autonomy, to better the lives of citizen in rural areas beyond being easily lured into unlawful activities.
2. **Salaries and Benefits:** Federal government should improve security personnels' salaries while in service and ensure instant settlement of post-service entitlement in avoidance of hardship and frustration could make them instrumental to perpetrators and masterminds of all manner of crimes.
3. **Psychosocial support**: The government should invest in training teachers, counsellors, and community volunteers to provide psychosocial support and trauma counselling to students who have experienced violence, displacement, or loss to promote resilience and emotional well-being among students. Psychosocial support services should also be incorporated into the school curriculum and extracurricular activities to ensure that students can receive counselling and support when they need it.

References

Garba, A. D., Ogunode, N. J., Musa, A. & Ahmed, I. (2022). Effects of insecurity on tertiary education in northeast Nigeria and way forward. Spanish journal of innovation and integrity, 2, 10-17. Learning: Coping Strategies Asia Pacific Journal of Multidisciplinary Research, Vol. 4, No.

Mohammed, H., & Ogunode, N. J. (2022). Impact of insecurity on secondary school administration North-West, geo-political zone, Nigeria. International Journal on Integrated Education, 5(3), 10-17.

Ogunode, N. J., & Abubakar. (2020). Higher education in Nigeria: challenges and the ways forward. Electronic Research Journal of Behavioural Sciences, 3.

Ogunode, N. J., & Adanna, C. M. (2022). Supervision of higher institutions in Nigeria: challenges and way forward. Pioneer: Journal of Advanced Research and Scientific Progress, 1, 26-37.

Ogunode, N. J., & Atobauka, I. S. (2021). Effects of brain-drain on higher institutions 'administration in Nigeria. Pindus Journal of Culture, Literature, and ELT, 8, 33-41.

Ogunode, N. J., & Chijindu, O. E. (2022). The implication of sit-at-home order (insecurity) on basic education in the southeast geo-political zone of Nigeria. Central Asian Journal of Social Sciences and History, 3(7), 21-29.

Ogunode, N. J., & Chijindu, O. E. (2022). The implication of sit-at-home order (insecurity) on

Ogunode, N. J., & Dahir, N. (2021). Challenges preventing public primary school students from using information communication technology for learning in Nigeria and the way forward. Electronic Research Journal of Social Sciences and Humanities, 3(III), 45-52.

Ogunode, N. J., & Murtala, O. M. (2022). Analysis of factors responsible for projects

Ogunode, N. J., & Oluseun, D. J. (2020). Administration of professional development program in Nigerian higher institutions: challenges and way forward. Intercathedra, 3(44), 147-155.

Ogunode, N. J., & Onyekachi, M. C. (2021). Education financing in Nigeria: Problems and the way forward. International Journal of Development and Public Policy, 1(5),162-176.

Ogunode, N. J., & Ukozor, C. U. (2022). The implication of insecurity on higher education in the south-east geo-political zone of Nigeria and the way forward. International Journal on Integrated Education, 5(7),77-85.

Ogunode, N. J., Akinjobi, F. N., & Musa, A. (2022). Analysis of factors responsible for Nigerians' patronizing of foreign higher education. European Multidisciplinary Journal of Modern Science, 6,19-29.

Ogunode, N. J., Akinjobi, F. N., & Musa, A. (2022). Analysis of factors responsible for Nigerians'patronizing of foreign higher education. European Multidisciplinary Journal of Modern Science, 6,19-29.

Ogunode, N. J., Godwin, A. N., & Unoaku, O. C. (2021). Effects of insecurity on school administration in Nigeria. Middle European Scientific Bulletin, 13. Retrieved December22, 2021 from https://cejsr.academicjournal.io/index.php/journal/article/view/628/572

Ogunode, N. J., Godwin, A. N., & Unoaku, O. C. (2021). Effects of insecurity on school

Ogunode, N. J., Jegede., & Musa, A. (2021). Problems Facing Academic Staff of Nigerian

Ogunode, N. J., Okwelogu, I. S., Elechukwu, J. E., & Yhaya. (2021). Academic staff of tertiary institutions in Nigeria and the problem of insecurity. Middle European Scientific

Ohiare, U. M. F., Ogunode, N. J., Rauf, O. S. (2021). Implementation of curriculum program in Nigerian higher institutions: problems and way forward. Academici Globe: Inderscience Resaerch, 2(6), 185-195.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202536

Impact of Generative-Artificial-Intelligence Strategy on Retention and Performance in Biology among Federal University of Education Zaria Students, Kaduna state, Nigeria

EZEAGHASI, Ngozi Eucharia[1]
.ngoziezeaghasi@gmail.com
08030937563

OBOCHI, Uchechukwu Maria[1]
Marisuche001@gmail.com
07068292646

[1]Department of Biology, School of Secondary Education (Sciences), Federal University of Education, Zaria, Kaduna State

Abstract
This study determines the Impact of Generative Artificial Intelligence (GAI) on Academic Performance Among Undergraduate Students in Biology Concept at Federal University of Education, Zaria, Nigeria. The study employed a quasi-experimental, non-randomized pre-test, post-test, post posttest, control group design involving 205 Undergraduate Biology Students from Federal University of Education, Zaria. The experimental group engaged in Generative Artificial Intelligence (GAI) Strategy for six weeks, while the control group received traditional classroom instruction. Data were collected using the instrument (Fixation Concept Performance Test FCPT), a 30-item multiple-choice assessment, and analyzed using mean, standard deviation, and t-test. Results indicated that using Generative Artificial Intelligence (GAI) strategy significantly improved students' Academic Performance. The experimental group achieved a higher mean post-test score (M = 28.36) compared to the control group (M = 18.99), with a statistically significant effect (p < 0.05) which is line with the study of Ransome., Fati & Okoli (2025). In the aspect of gender differences male students performed slightly higher than females, with no statistical difference. Suggesting that the treatment is gender friendly. The study recommends that the institution should formally integrate GAI applications such as ChatGPT, DALL·E, and Codex into biology instruction. These tools can simplify complex biological topics by offering dynamic explanations, creating visual content, and simulating biological processes, among others.
Keyword: Generative Artificial Intelligence, Biology, Retention, Performance, Gender.

Introduction
Biology is a science subject that concerned with the study of living organisms, its environment and interactions with one another. It is a compulsory and also a basic requirement for admission into tertiary institutions for science students (Okwo and Tawtigyas,2012 & Fati *et al.*,2020) Fixation is biology course which cannot be taught effectively in class without taking the students to the laboratory and bringing the student to proper observation and demonstration. Learning about biological concept and processes without activities, demonstrations and observations will not enhance concrete understanding especially abstract concepts Brooks *et al.,* (2021) and Timothy (2021). Artificial Intelligence is a powerful tool which have the potential to transform teaching and learning processes according to Gosh *et al* (2021), AI is a branch of Computer Science that deals in creating systems that emulate human behavior to enhance performance in various scientific and technological fields. Generative Artificial Intelligence is among the most innovative area of AI machine learning that create concrete learning. Generative Artificial Intelligence includes technologies like Chat GPT, DALL-E, Codex, Music LM, MidJourney etc GAI creates new content data which includes images music and text, it also generates models that resembles the original. The application of AI is diverse which includes personalized learning experiences, enhance creativity, revolutionize teaching and learning processes (Lim *et al*., 2022; Selker, 2023). ChatGPT (developed by OpenAI) is a conversational artificial intelligence model built on transformer-based architecture. It is capable of processing and generating human-like text based on input prompts (UNESCO,2021). In the context of biology education, ChatGPT can serve as a virtual learning assistant by providing detailed explanations of biological concepts, summarizing textbooks and scientific articles, supporting students with writing lab reports and assignments, and simplifying complex topics such as DNA replication and natural selection. Google Bard, powered by Google's Gemini (formerly PaLM) language model, functions similarly to ChatGPT but integrates more directly with Google's online ecosystem. Bard assists students by delivering updated information, generating learning materials such as study guides and mock test questions, and condensing lengthy academic content into accessible summaries (Choi., Hickman., Monahan., & Schwarcz, 2023). DALL·E, another innovation by Open AI, is a Generative AI model that transforms textual descriptions into

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202536

visual representations. In biology, it can be used to produce educational illustrations of biological structures like cells and organs, depict microscopic processes such as mitosis and photosynthesis, and create custom diagrams for instructional use in lectures and presentations. Codex (also by Open AI) is a generative model tailored for code generation. It interprets natural language and converts it into programming code, making it especially valuable in fields like bioinformatics and computational biology. Students and educators can utilize Codex to design simulations of biological processes, automate data analysis (e.g., DNA sequencing), and develop interactive educational tools such as biology-themed applications and games. MusicLM, developed by Google, is designed to generate music from textual inputs. Although not directly related to biology, it can support biology education indirectly by providing background music for educational videos, enhancing learning environments with audio aids, and contributing to studies in cognitive science or neurobiology related to auditory stimuli. MidJourney is a generative image tool known for producing high-quality artistic visuals based on user-defined text prompts. In the context of biological sciences, it can be used to visualize complex or theoretical concepts such as extinct species or evolutionary transitions, generate creative interpretations of biological phenomena, and enhance the visual appeal of biology classroom materials and digital content.

In today's rapidly advancing technological era, the integration of Artificial Intelligence (AI) into educational settings has gained significant attention. One area that has witnessed notable advancements is the use of Chatbot AI in enhancing the learning experience and academic outcome of students (Kooli, 2023). Chatbot is a computer program designed to stimulate conservation with people through text, voice etc. Chatbot's potential impact on Biology and other fields is as it can answer life biological science questions, become a useful learning tool but its effectiveness may depend on how it is integrated into the curriculum and the support students receive from teachers (Ngbarabara & Odibo (2024). In recent years, a growing body of research has explored the integration of AI into education, highlighting its ability to enhance learning processes and outcomes. Chatbot, are widely regarded as transformation tools that can improve traditional educational methods and enhance learners' academic achievement and performance (Sari *et al.,* 2024). According to Kooli (2023), The integration of Artificial Intelligence (AI) and Chatbots into education and research completely revolutionized the educational sector specifically as from the end of 2022.Mohammed and Daif -Allah (2023) said that the use of of visual aids significantly enhances students understanding of complex biological concepts. According to Hassoun, Jefferson (2022); Ngonso; Ukhurebor &Uduehi, (2025) the majority of Nigerian students used AI and GAI has positive impacts on the educational performance of the Nigerian students and are more familiar with Snapchat AI and ChatGPT (Ngonso; Ukhurebor &Uduehi, 2025). Regarding gender and academic performance in using AI, Female women have a lower understanding of AI than male (Franken& Mauritz 2021). Female are less frequently involved in research and development on AI, Idongesit & Ndo (2024), clearly in the minority in science professions and study programme, and less frequently in management positions (Campbell, Kelly-Weber, & Lavallee ,2021). kuta *et al* (2024) revealed no significant difference in both sexes. John; Ali & Chike (2025) revealed that students learning achievement using static and animated infographics platform have a distinct variation in the achievements scores on human digestive system over those exposed to lecture method.

The academic performance of biology student at Federal University of Education, Zaria is not encouraging despite the importance of ICT to transform teaching and learning and increasing integration of technology in education. The reason for the poor performance may be due to complex and abstract nature of some concepts in biology and methods of teaching by most biology lecturers, which often fail to adequately engage students or address their individual Learning needs, leading to non-conceptual learning outcome. Generative Artificial Intelligence (GAI) has the potential to revolutionize biology by Providing personalized and interactive learning experiences. However, there is a lack of empirical evidence on its effectiveness in improving students' achievement in the context of Nigerian Universities (Ransome., Fati, & Okoli, 2025). Specifically, it is unclear whether the application of Generative AI can enhance the academic performance of biology students at Federal University of Education, Zaria. This study sought to address this gap by investigating the impact of Generative AI on the academic performance of biology undergraduate students at Federal University of Education, Zaria and also promote gender equity in biology education.

Objectives of the Study

The main objective of the study was

1. to examine the impact of Generative Artificial Intelligence Strategy and lecture method on Undergraduate Biology Students taught Fixation Concept at Federal University of Education Zaria, Kaduna State.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202536

2. to investigate the impact of using Generative Artificial Intelligence Strategy only on male and female Undergraduate Biology Students taught Fixation Concept at Federal University of Education, Zaria, Kaduna State.
3. To determine the retentive ability of Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence Strategy and lecture method at Federal University of Education Zaria, Kaduna State.

Research Questions

The following research questions guided the study:

RQ$_1$. What are the mean academic performance scores of students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught the same concept using lecture method?

RQ$_2$ What are the mean academic performance scores of male and female Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence strategy only.

RQ$_3$: What is the difference between the retention mean scores of students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught the same concept using lecture method?

Hypotheses

The following three hypotheses were formulated and tested at $P \leq 0.05$ level of significance:

Ho$_1$: There is no significant difference in the mean academic performance scores of Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught using lecture method?

Ho$_2$: There is no significant difference in the mean academic performance scores of male and female Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence strategy.

Ho$_3$: There is no significant difference between the retention mean scores of undergraduate biology students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught the same concept using lecture method.

Methodology

This study employed a quasi-experimental design to investigate the impact of Generative Artificial Intelligence (GAI) on the Academic Performance of Undergraduate Biology Students taught Fixation Concept (BIOL 213) 2024 /2025 session using Generative Artificial Intelligence Strategy and those taught the same concept using lecture method at Federal University Zaria, Kaduna state. The experimental group was exposed to Generative AI tools (ChatGPT, DALL-E, Codex, Canvas, Copilot) integrated into their learning activities, while the control group received traditional teaching methods. The population for this study consisted of 205 second-year Biology Students of 2024/2025 session. A sample of 150 students was selected through random sampling (40 males and 38 females) for experimental group only. The control group was 77. The Fixation Concept Performance Test (FCPT), a 30-item multiple-choice questions, was employed as the instrument for data collection and to measure students' understanding and knowledge of the concept to determine the academic performance of second year students in Department of Biology. The instrument was developed using test blue print adopted from bloom's taxonomy of educational objectives. A copy of the instrument was validated by two experts with qualification of PhD from the Department of Science Education and Department of Computer Engineering, Ahmadu Bello University, Zaria. The impact of the expert was used to construct the final draft of the instrument. The reliability of the instrument was established using the Kuder-Richardson formula 21, yielding an index of 0.74, indicating acceptable reliability for the study. Subjects were divided into two groups an experimental group and a control group. Both groups were subjected to a pre-test in week 1, using the FCPT to ensure comparability. The treatment for the experimental group involved exposing students to the use of each GAI tool in week 1. In week 2, the students were introduced to use ChatGPT in defining the Fixation Concept and its sub topics on their own mobile devices. In week 3, the students were taught how to use DALL-E in creating visual contents relating to the topics e.g., to generate labeled histological process. In week 4. Copilot was introduced to explain the concept of cellular changes before and after fixation. Week 5 students were introduced to the use of drawing Canvas for info-graphic in-order to make complex information easier and also engage students with the use of charts and diagrams. In week 6, both groups were subjected to a post-test using the FCPT to determine the academic performance. The control group continued with just the lecture method of instruction, including textbook assignments. The subject scores were collected for both the experimental and control groups. The experimental group scores only were sorted into male and female to test for gender effect and the data was further subjected to data analysis. Data analysis used were descriptive statistics (mean and standard deviation) to answer the research questions., t-tests were used to test the null hypotheses at $P \leq 0.05$ level of significance to determine if there were significant differences between the pre-test and post-test scores of the experimental and control groups. Additionally, gender differences in academic performance gains were analyzed to examine the impact of GAI on male and female students.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202536

Presentation of Results

The study investigates the Impact of Generative Artificial Intelligence (GAI) on Academic Performance among Undergraduate Students on Biology Concept at Federal University of Education, Zaria. The analysis examines how Generative Artificial Intelligence (GAI) strategy, gender, and pretest scores influenced students' post-test performance.

Research Question One: What is the difference between mean academic performance scores of undergraduate biology students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught using lecture method?

To answer research question one, post-test scores of experimental and control groups generated from Fixation Concept Performance Test (FCPT) were subjected to descriptive analysis. The mean scores and standard deviation of the statistics is presented in Table 1.

Table 1: Mean and Standard Deviation of Post-test Scores of Undergraduate Biology Students in the Experimental and Control Groups

Groups	N	Mean	Std. Deviation	Mean Difference
Experimental	73	17.41	6.17	2.42
Control Group	77	14.99	4.92	

The result in Table 1 showed that differences exist in the mean performance scores of undergraduate biology students when taught Fixation concept using Generative Artificial Intelligence Strategy. Mean scores of 17.41 and 6.17 were obtained with a mean difference of 2.42 in favour of students in the experimental group. The table revealed that undergraduate biology students exposed to Generative Artificial Intelligence Strategy performed better than their counterparts taught same concepts using Lecture Method. To determine whether the mean difference is significant or not, hypothesis one was tested at $\alpha \leq 0.05$ as presented in Table 2.

Null Hypothesis One: There is no significant difference in the mean academic performance scores of Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught with lecture method.

To test null hypothesis one, the post-test scores obtained from FCPT (Table 1) for both experimental and control groups were subjected to an independent sample t-test statistic at $\alpha \leq 0.05$. Summary of the analysis is presented in Table 2.

Table 2: Independent Samples t-test Analysis of Mean Performance Scores between Experimental and Control Groups

Group	N	Mean	Std. Dev.	df	t	p	Remark	Decision
Experimental	73	17.41	6.17	148	2.67	0.01	Significant	HO_1 Rejected
Control	77	14.99	4.92					

Significant at $p \leq 0.05$ level

Table 2 revealed that significant difference exists between the performance mean scores of undergraduate biology students in the experimental and control groups, t (2.67), p = 0.01, which is less than 0.05 α level of significance at 203 degrees of freedom. The experimental and control groups recorded mean scores of 17.41 and 14.99 respectively. Therefore, the null hypothesis which stated that there is no significant difference in the mean academic performance scores of Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught same concept using lecture method is hereby rejected. This is because the p value of 0.01 is less than 0.05 α level of significance set for rejection are acceptance of the hypothesis. This implies that students' scores were enhanced after exposure to Generative Artificial Intelligence Strategy suggesting that Generative Intelligence Strategy is more effective in improving students' performance in Fixation Concepts than the Lecture Method.

Research Question Two: What are the mean academic performance scores of male and female Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence strategy only?

To answer research question two, post-test scores of male and female students in the experimental group generated from Fixation Concept Performance Test (FCPT) were subjected to descriptive analysis. The mean scores and standard deviation of the statistics is presented in Table 3.

Table 3: Mean and Standard Deviation of Post-test Scores of Students in the Experimental Group

Groups	n	Mean	Std. Deviation	Mean Difference
Male	34	18.41	6.24	1.87

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202536

Female	39	16.54	6.05

The result in Table 3 showed that differences exist in the mean performance scores of male and female Biology Students when taught Fixation concepts using Generative Artificial Intelligence Strategy. Mean scores of 18.41 and 16.54 were obtained with a mean difference of 1.87 in favour of male biology students in the experimental group. The table revealed that male biology students exposed to Generative Artificial Intelligence Strategy performed better than their female counterparts taught same concepts using Generative Artificial Intelligence Strategy. To determine whether the mean difference is significant or not, hypothesis two was tested at $\alpha \leq 0.05$ as presented in Table 4.

Null Hypothesis Two: There is no significant difference in the mean academic performance scores of male and female Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence strategy.

Table 4: Independent Samples t-test Analysis of Mean Performance Scores of Male and Female Undergraduate Biology Students in the Experimental Group

Group	n	Mean	Std. Dev.	df	t	p	Remark	Decision
Male	34	18.41	6.24	71	1.30	0.20	Not Sig.	HO_2 Retained
Female	39	16.54	6.15					

Not Significant at $\alpha > 0.05$ level

Table 4 revealed that significant difference exists between the performance mean scores of male and female undergraduate biology students in the experimental group, $t(71) = 1.30$, $p = 0.20$, which is greater than 0.05 level of significance. The male and female undergraduate biology students recorded mean scores of 18.41 and 16.54 respectively. The difference in mean was in favour of male undergraduate biology students, however, the difference was insignificant. Therefore, the null hypothesis which stated that there is no significant difference in the mean academic performance scores of male and female Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence strategy is thus retained. This implies that performance scores of both male and female undergraduate biology students were enhanced after exposure to Generative Artificial Intelligence Strategy implying that the strategy is gender friendly.

Research Question Three: What is the difference between the retention mean scores of students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught using lecture method?

To answer research question three, post post-test scores of undergraduate biology students in the experimental and control groups generated from FCPT were also subjected to descriptive analysis for the mean and standard deviation scores. Summary of the analysis is presented in Table 5.

Table 5: Post Posttest Retention Ability Mean Scores of Undergraduate Biology Students in the Experimental and Control Groups

Group	n	Mean	Std. Deviation	Mean Difference
Experimental	73	16.04	5.66	2.45
Control	47	13.59	3.19	

Table 5 revealed that difference exist in the retention ability of undergraduate biology students taught Fixation concept using Generative Artificial Intelligence strategy with those taught using Lecture Method. The experimental group had a higher mean retention score of 16.04 compared to that of the control group who had 13.19 with mean difference of 2.45. The mean difference is in favour of undergraduate biology students in the experimental group. In order to find out if the difference is significant, the data was further subjected to an independent samples t-test at $\alpha \leq 0.05$.

Null Hypothesis Three: There is no significant difference between the retention mean scores of undergraduate biology students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught using lecture method.

To test null hypothesis three, the post posttest scores of undergraduate biology students in the experimental and control groups obtained from FCPT were subjected to independent samples t-test analysis at $\alpha \leq 0.05$ level of significance. Summary of the statistics is presented in Table 6.

Table 6: Independent t-test Analysis of Mean Retention Scores for Undergraduate Biology Students in the Experimental and Control Groups

Group	n	Mean	Std. Deviation	df	t	p	Remark	Decision
Experimental	73	16.04	5.66	148	3.24	0.00	Sig.	Ho_3 Rejected

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202536

Control	77	13.59	3.19

Significant at α ≤ 0.05 level

Table 4.6 revealed that there is significant difference between the mean retention ability scores of undergraduate biology students in the experimental and control groups, t (148) = 3.24, p = 0.00 which is less than 0.05 level of significance. The experimental and control group recorded mean scores of 16.04 and 13.59 respectively. Therefore, the null hypothesis which stated that there is no significant difference between the retention mean scores of undergraduate biology students taught Fixation Concept using Generative Artificial Intelligence Strategy and those taught the same concept using lecture method is hereby rejected. This implies that students' scores at post posttest exposed to Generative Artificial Intelligence was found to be more effective in improving students' retention ability in fixation concept than the Lecture Method.

Discussion of Findings

The findings of this study show significant difference in the academic performance of the experimental group over control group. The experimental group which received Generative Artificial Intelligence strategy achieved higher post-test scores (Mean =17.41 with Standard Deviation = 6.17) compared to the control group (Mean =14.99, Standard Deviation = 4.92), with the mean difference (2.42) , this shows that Generative Artificial Intelligence strategy shows positive academic performance over lecture as shown in Table 1.This finding is in line with the work of Ngbarabara & Odibo (2024) who opined that GAI has significant improvement in academic achievement. Ransome., Fati & Okoli (2025) that said using static and animated infographics on human digestive provides significant outcome. Research question two looked at the difference in the mean academic performance scores of male and female Undergraduate Biology Students taught Fixation Concept using Generative Artificial Intelligence strategy the findings on this said that male students (Mean=18.41) showed slightly higher difference than female (mean= 16.54) in the posttest scores which was not statistically significant when tested at P ≤ 0.05. with mean difference (1.87). The HO_2 was retained in table 3. The current findings suggest that when learning is contextualized in hands-on activities where male and female students were given equal chance of participation both can achieve comparable results kuta *et al* (2024) Ngbarabara & Odibo (2024) and Ransome., Fati & Okoli (2025). Research question three revealed that difference exist in the retention ability of undergraduate biology students taught Fixation concept using Generative Artificial Intelligence strategy with those taught using Lecture Method. The experimental group had a higher mean retention score of 16.04 compared to that of the control group who had 13.19 with mean difference of 2.45. The mean difference is in favour of undergraduate biology students in the experimental group. The findings agreed with that of Ngbarabara & Odibo (2024) and Ransome., Fati & Okoli (2025)

Conclusion

Generative Artificial Intelligence represents a revolutionary shift in education and knowledge delivery. Its ability to create, visualize, simulate, and explain content aligns well with the demands of modern biology education. At institutions like the Federal University of Education, Zaria, incorporating GAI into teaching and learning strategies has the potential to improve academic performance, enhance conceptual understanding, and equip students with 21st-century skills.

Recommendation

Based on the outcomes and observations from this study on the use of Generative Artificial Intelligence (GAI) in biology education, the following recommendations are suggested to enhance academic performance and learning outcomes:

i. The institution should formally integrate GAI applications such as ChatGPT, DALL·E, and Codex into biology instruction. These tools can simplify complex biological topics by offering dynamic explanations, creating visual content, and simulating biological processes.
ii. The university should organize targeted training sessions and orientation programs for both students and lecturers. These sessions will equip users with the necessary skills to apply GAI responsibly and effectively in academic tasks, while also reducing the potential for misuse.
iii. Educators and curriculum developers should be encouraged to incorporate AI-generated content into lesson delivery. This could include animated visual aids, auto-generated quizzes, and interactive diagrams to promote student engagement and better conceptual understanding.
iv. Students should be encouraged to integrate AI tools into group assignments and discussions, using them as a resource for idea generation and problem-solving. This collaborative use fosters critical thinking and creativity while reducing over reliance on AI-generated answers.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202536

References

Brooks, D. S., DiFrisco, J., & Wimsatt, W. C. (2021). Introduction: Levels of Organization: The Architecture of the Scientific Image. In D. S. Brooks, J. DiFrisco, & W. C. Wimsatt (Eds.), *Levels of Organization in the Biological Sciences* (pp. 1–20). MIT Press. https://doi.org/10.7551/mitpress/12389.003.0004

Choi, J. H., Hickman, K. E., Monahan, A., & Schwarcz, D. (2023). ChatGPT goes to Law School: The AI Chatbot Passed Exams in Four Courses at the University of Minnesota. *SSRN*. https://doi.org/10.2139/ssrn.4335905

Ali, F., Adamu, Z. E., Kuta, I. I., & Tukura, C. S. (2020). Effectiveness of Peer-Led Guided Inquiry Strategy on Low-Achievers' Retention of Biology Concepts in Paiko, Niger State Nigeria. *International Journal of Educational & Research, 3*(10), 10–22.

Franken, S., & Mauritz, N. (2021). Gender and Artificial Intelligence – Differences Regarding the Perception, Competence Self-Assessment and Trust. *ResearchGate.* https://doi.org/10.13140/RG.2.2.18755.68646

Hassoun, J. (2022). Artificial Intelligence for Biology. *Integrative and Comparative Biology, 61*(6), 2267–2275.

Idongesit, N. U., & Ndo, I. U. (2024). The Difference in Academic Performance of Senior Secondary School Biology Students Exposed to Chatbot AI or Expository Method Based on their Gender. *International Journal of Modern Health Systems and Medical Sciences, 2*(1), 243-260.

Kooli, C. (2023). Chatbots in Education and Research: A Critical Examination of Ethical Implications and Solutions. *Sustainability, 15*(7), 5614. https://doi.org/10.3390/su15075614

Kuta, I. I., Tukura, C. S., Yahaya, F., Ali, F., & Ndatsu, A. (2024). Effects of Computer Assisted Instruction with Animation on Biology Students' Achievement in Niger State (Post COVID-19 Remedy for Teaching and Learning). *Ceddi Journal of Education, 3*(1). https://doi.org/10.56134/cje.v3i1.76

Mohammed, Y., & Daif-Allah, A. (2023). The Interaction between Brain-Based Learning Strategies and Patterns of Infographics and its Influence on the Development of Information Concepts among Saudi Undergraduate Cybersecurity Students. *F1000Research, 12*, 441.

Ngbarabara, P. B., & Odibo, A. (2024). Effect of Generative Artificial Intelligence (GAI) on Science Education Students' Achievements in Federal University Otuoke, Bayelsa State. *FUO-Journal of Educational Research, 3*(1), 342-351.

Ngonso, B. F., Ukhurebor, K. E., & Uduehi, I. (2025). Influence of Artificial Intelligence in Educational Performance of Nigerian Students in Tertiary Institution in Nigeria. *Journal of Infrastructure Policy and Development, 9*(1), 9949.

Ransome, J., Ali, F., & Okoli, C. (2025). Enhancing Senior Secondary School Biology Students' Academic Achievement using Static and Animated Infographics Platforms in Niger State, Nigeria. *Journal of Education Research and Library Practice, 7*(8), 45-55.

Sari, H. E., Tumanggor, B., & Efron, D. (2024). Improving Educational Outcomes Through Adaptive Learning Systems Using AI. *International Transactions on Artificial Intelligence, 3*(1), 341-350.

Selker, T. (2023). AI for the Generation and Testing of Ideas: Towards an AI Supported Knowledge Development Environment. *ResearchGate.* https://www.researchgate.net/publication/372444782_AI_for_the_Generation_and_Testing_of_Ideas_Towards_an_AI_Supported_Knowledge_Development_Environment

Timothy, O. B. (2021). Science Experience as Correlate of Student Learning Outcome. *International Journal of Theory and Application in Elementary and Secondary School Education, 3*(1), 15–24.

UNESCO. (2021). *AI and Education: Guidance for Policy-makers*. https://unesdoc.unesco.org/ark:/48223/pf0000376709

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202537

Impact of Christian Educators on integration of Artificial Intelligence-Enhanced learning using Faith-Based values among Christians in Kaduna state, Nigeria

UMEH, Chinwe Blessing[1]
umehchinwe82@gmail.com
08035826084

HILLARY, Edward Zaman[2]
hillaryzaman2020@gmail.com
07064317962

KUCHAKS, Dorcas Peter [1]
dpkuchaks@gmail.com
08074950267

[1]Department of Christian Religious Studies, Federal University of Education, Zaria
[2] Christian Religious Studies Section, Department of Arts and Social Science Education, ABU, Zaria.
[1]Department of Christian Religious Studies, Federal University of Education, Zaria

Abstract
This study explored the Impact of Christian Educators on integration of Artificial Intelligence-Enhanced learning using faith-Based values among Christians in Kaduna state, Nigeria, using a descriptive survey research design. Out of a total population of 12,564 in the state, a random sample of 232 respondents was selected to participate. Data were collected through a structured questionnaire and analyzed using descriptive statistics. The results showed that Christian educators are instrumental in directing AI-enhanced learning to reflect Christian values by offering ethical leadership, integrating faith-based content, providing spiritual guidance, and promoting responsible, value-driven technology use. The study concludes that Christian educators are central to ensuring that AI-integrated educational settings maintain moral and spiritual integrity amidst technological advancement. Their active engagement in ethical oversight, spiritual mentorship, and curriculum development helps anchor innovation in biblical principles. Based on these findings, it is recommended that Christian educators be fully involved in the selection and adaptation of AI tools to align with scriptural values. In addition, regular training should be provided to equip them with the skills needed to infuse faith-based principles into AI-assisted teaching.
Keyword: Christian Educators, AI-Enhanced Learning Environments, Faith-Based Values

Introduction
The integration of Artificial Intelligence (AI) into educational systems globally is transforming teaching and learning processes by introducing automation, personalized instruction, and data-driven decision-making. In Nigeria, AI-enhanced learning environments are gradually emerging within both public and private institutions, offering opportunities to improve efficiency, accessibility, and engagement. However, as AI technologies become more embedded in the educational landscape, concerns are rising regarding their alignment with ethical, cultural, and spiritual values. For Christian educators in Nigeria, this shift demands an active engagement with AI tools to ensure that such innovations reinforce rather than undermine the biblical principles that form the foundation of Christian education (Okon, 2021).

Christian education traditionally emphasizes the development of the whole person—intellectually, morally, and spiritually. This holistic approach stands in contrast to the often mechanistic and utilitarian models embedded in AI systems. AI tends to focus on cognitive output, performance metrics, and behavioral prediction, potentially neglecting the deeper aspects of character formation and spiritual growth (Adeyemi, 2020). Christian educators, therefore, play a critical role in shaping how AI is implemented in faith-based schools, ensuring that the use of technology supports rather than displaces the mission of cultivating Christlike virtues such as honesty, compassion, stewardship, and justice. In many Nigerian Christian schools, educators serve not only as academic instructors but also as spiritual mentors who guide students in moral reasoning and biblical worldview formation. Their involvement in AI integration is vital in curating content, guiding ethical use, and monitoring the pedagogical impact of technological tools. As Eze (2022) asserts, the educator in a Christian setting is responsible for discerning and filtering technological resources to maintain alignment with Scripture and the school's mission. In this sense, the Christian

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202537

educator becomes both a gatekeeper and a facilitator—guarding against secular ideologies embedded in AI algorithms and ensuring that the spiritual dimension of education is not lost in the pursuit of innovation. Similarly, the current pace of AI development often surpasses ethical considerations, raising questions about surveillance, data privacy, bias, and human agency. These issues carry theological and moral implications, especially within Christian institutions. Christian educators in Nigeria must be equipped to critically evaluate these dimensions, advocating for transparency, equity, and respect for human dignity in the deployment of AI systems. According to Musa (2019), Christian education must resist technological determinism and instead promote a redemptive view of technology one that sees AI as a tool to be stewarded wisely, not a force to be uncritically adopted.

Despite the importance of these roles, there remains a gap in both scholarship and practice regarding how Christian educators in Nigeria are engaging with AI. Limited resources, lack of training, and the absence of clear frameworks for faith-integrated technological pedagogy pose significant challenges. This gap necessitates intentional inquiry into how Christian educators can shape AI-enhanced learning environments that not only achieve academic excellence but also uphold and transmit faith-based values. It also calls for collaboration between theologians, educators, and technologists in developing models that harmonize technological advancement with spiritual formation (Ibrahim, 2023).

Christian Educators and AI-Enhanced Learning Environments in Nigeria

Artificial Intelligence (AI) is redefining the landscape of global education by introducing tools that enhance personalized learning, data-driven assessments, and virtual instruction. In Nigeria, the integration of AI into educational systems presents both an opportunity and a moral challenge, especially for Christian educators tasked with maintaining spiritual and ethical integrity. Christian educators are increasingly called to shape AI-enhanced learning environments in ways that affirm biblical principles, nurture moral character, and resist technological determinism. As highlighted by Mordi (2020), educators who are rooted in Christian values have a pivotal role in preserving the sanctity of human agency amid algorithmic influence. AI's capacity to customize learning pathways based on student data fosters efficiency and engagement. However, Christian educators are concerned with how these algorithms may inadvertently enforce secular worldviews or biases if not carefully scrutinized. According to Ejiofor (2021), such biases embedded in AI technologies risk promoting content that marginalizes Christian thought or fails to consider the spiritual dimension of human development. Christian educators, therefore, must advocate for systems that incorporate ethical safeguards and provide balanced, value-based content. Furthermore, AI-driven tools such as intelligent tutoring systems and automated essay graders often exclude the affective and spiritual dimensions of learning. For Christian educators, this exclusion presents a theological gap. As stated by Uchenna (2019), learning in the Christian tradition is holistic, encompassing spiritual, emotional, and intellectual growth. Therefore, AI systems should be adapted to support not only cognitive performance but also character education, compassion, and empathy—values central to Christian education. In AI-mediated classrooms, Christian educators must also model discernment and spiritual wisdom in the use of technology. While AI can serve as a tool, it cannot substitute the role of a teacher as a moral guide and spiritual mentor. Oloruntoba (2022) observed that Nigerian Christian teachers are critical in mediating between technological advancement and biblical worldview formation. Their presence ensures that learners are not merely informed but transformed by values rooted in Christlikeness.

A major concern in AI-enhanced learning is the depersonalization of education, where students interact more with machines than with mentors. This trend challenges the Christian view of education as relational and communal. According to Nwankwo (2020), Christian education in Nigeria emphasizes the role of fellowship, mentorship, and moral accountability—values that cannot be encoded into artificial systems. As such, Christian educators must strike a balance by integrating AI tools without undermining the human element of spiritual formation. Similarly, AI tools often rely on surveillance and data tracking, raising ethical concerns about student privacy. From a Christian perspective, protecting human dignity and respecting personal boundaries are fundamental. Adebanjo (2018) asserted that Christian educators in Nigeria must question how data is collected, stored, and used, advocating for AI systems that uphold transparency and ethical responsibility. They should challenge any practices that exploit student data for profit or manipulate behavior without consent. In the broader Nigerian context, many schools—especially faith-based institutions—face infrastructural and digital literacy challenges that limit the effective use of AI. Yet, Christian educators are uniquely positioned to address this gap by promoting equity, inclusivity, and stewardship. As emphasized by Oladimeji (2021), Christian schools should not merely adopt AI tools, but do so in ways that foster justice and accessibility, ensuring that no student is left behind due to economic or social disadvantage. Curriculum development in AI-enhanced environments must also reflect Christian values. If curricula are designed solely based on technological efficiency,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202537

they may neglect the spiritual and moral formation essential to Christian education. Iwuagwu (2017) warned that over-reliance on technological frameworks risks creating learners who are competent but lack integrity. Christian educators must therefore collaborate with developers to ensure that content includes faith-based perspectives and cultivates virtues such as humility, honesty, and service. Another critical responsibility of Christian educators in Nigeria is training students to engage with AI critically and ethically. Instead of treating AI as a neutral tool, students must learn to examine the moral implications of algorithms, automation, and digital decision-making. According to Anozie (2023), integrating biblical ethics into digital literacy programs helps students understand the power of technology while anchoring their decisions in Christian principles. Such training empowers them to become responsible users and future developers of AI systems.

The rapid integration of Artificial Intelligence (AI) into educational systems across the globe, including Nigeria, has raised critical questions about the preservation of moral, ethical, and spiritual values in learning environments. While AI tools offer enhanced efficiency, personalized learning, and data-driven instruction, they are often developed within secular frameworks that may not account for the spiritual development of learners. This presents a challenge for Christian educators, who are called not only to deliver academic content but also to nurture students' faith, moral integrity, and holistic character. The concern is that AI-driven learning environments, if left unexamined, could undermine Christian values by promoting worldviews that conflict with biblical principles. In the Nigerian context, where Christian education has historically emphasized moral instruction and spiritual formation, the adoption of AI technologies without faith-based oversight could widen the disconnect between technological innovation and value-based education. Christian schools and educators may struggle to influence the design and implementation of AI tools that often come with pre-programmed content, assessment standards, and ethical assumptions that are not grounded in Christian theology. Consequently, there is an urgent need to understand how Christian educators can actively shape AI-enhanced learning environments to align with faith-based values, ensuring that technology serves rather than disrupts the mission of Christian education.

Furthermore, the lack of clear frameworks, resources, and theological guidance on integrating AI within Christian pedagogy compounds the problem. Many educators may not be adequately trained to assess or adapt AI tools in ways that uphold Christian ethics, leading to passive adoption of technologies that may compromise the spiritual and moral goals of education. This creates a gap in research and practice regarding the role of Christian educators in ensuring that AI does not diminish the human, relational, and divine dimensions of learning. Addressing this problem requires critical reflection on how faith and technology can coexist harmoniously within educational spaces.

Objectives of the study

1. To assess the impact of Christian educators on integration of AI-Enhanced learning environment using faith-based values among Christians in Kaduna state.

Research Questions

1. What is the mean response of the impact of Christian educators on integration of AI-Enhanced learning environment using faith-based values among Christians in Kaduna state?

Hypotheses

1. There is no significant difference between the mean response on the impact of Christian educators and integration of AI-Enhanced learning environment using faith-based values among Christians in Kaduna state.

Methodology

The research adopted a descriptive survey design and centered on Christian students. A total of 240 participants were chosen through simple random sampling from a population of 12,564. Data were gathered using a structured questionnaire, with 232 completed and returned, resulting in a high response rate of 96.7%. The researcher was responsible for both the distribution and collection of the copies of questionnaire. Analysis of the data was performed using SPSS version 20, employing a four-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). A mean score of 2.50 was used as the decision criterion; scores at or above this threshold indicated agreement, while scores below signified disagreement. The hypothesis of the study was evaluated using a t-test at the 0.05 significance level.

Presentation of Results

The study found that Christian educators are essential in guiding AI-enhanced learning to reflect faith-based values through ethical leadership, content integration, spiritual mentorship, and advocacy for responsible, value-centered technology use.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202537

Research Question 1

What is the mean response of the impact of Christian educators on integration of AI-Enhanced learning environment using faith-based values among Christians in Kaduna state?

Table 1: Opinions of the Respondents on the impact of Christian educators on integration of AI-Enhanced learning environment using faith-based values.

S/N	Item Statements	SA	A	D	SD	Mean	Decision
1	Christian educators ensure that AI tools and content uphold biblical ethics, promoting honesty, compassion, and integrity.	100	69	30	33	3.02	Accepted
2	They help integrate Christian perspectives into AI-generated learning materials, ensuring faith-based values are reflected in teaching content.	128	57	26	21	3.26	Accepted
3	Christian educators provide moral and spiritual guidance that AI cannot offer, nurturing the holistic development of students.	147	55	20	10	3.46	Accepted
4	They assess AI technologies for potential bias, secular ideologies, or content that may conflict with Christian teachings.	175	45	8	4	3.69	Accepted
5	Christian educators advocate for the design and use of AI systems that respect human dignity and promote equity, justice, and godly character.	210	16	6	0	3.88	Accepted
	Cumulative					**3.46**	

Decision mean = 2.50, Source: Field Survey, 2025

Table 1 shows that all item mean scores exceeded the benchmark value of 2.5. The individual item means ranged from 3.02 to 3.88, indicating a general consensus among respondents in support of the statements. With an overall mean score of 3.46 well above the threshold there is clear evidence supporting the role of Christian educators in shaping AI-enhanced learning environments aligned with faith-based values. Consequently, all item means were deemed valid and retained for further analysis.

Hypothesis 1

There is no significant difference between the mean response on the impact of Christian educators and integration of AI-Enhanced learning environment using faith-based values among Christians in Kaduna state

Table 2: Summary of One Sample T-Test on the mean response on the impact of Christian educators and integration of AI-Enhanced learning environment using faith-based values among Christians in Kaduna state.

Variable	N	Mean	Std.	Mean diff	Decision
Hypo[1]	232	3.0172	1.06485	3.01724	0.00

Table 2 presents the results of the One-Sample T-Test conducted to evaluate the role of Christian educators in shaping AI-enhanced learning environments aligned with faith-based values. The study involved 232 respondents. The analysis produced a mean score of 3.0172 and a standard deviation of 1.06485, indicating a moderate degree of response variation among participants. The mean difference of 3.01724 from the test value indicates a statistically significant role of Christian educators in this context. As a result, the null hypothesis which proposed that Christian educators do not significantly influence the alignment of AI-enhanced learning environments with faith-based values is rejected.

Discussion of Findings

The primary aim of this study was to explore the impact of Christian educators on integration of AI-Enhanced learning environment using faith-based values among Christians in Kaduna state. Through the analysis of data collected from a cross-

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202537

section of educators, administrators, and stakeholders within Christian educational institutions, the research uncovered that Christian educators hold a pivotal role in maintaining the moral and spiritual integrity of technology-driven learning. Their influence is seen in the promotion of biblical ethics, the incorporation of Christian worldviews into AI-generated content, and the provision of spiritual mentorship, which AI systems are inherently incapable of offering. Furthermore, Christian educators were found to act as gatekeepers by evaluating AI tools for ideological biases and promoting responsible, human-centered uses of technology within their schools.

This finding aligns with the assertion by Adeyemi (2020), who asserts that Christian educators serve as moral compasses in technologically evolving educational landscapes, ensuring that innovation does not overshadow spiritual development. Adeyemi emphasizes that in a society increasingly shaped by artificial intelligence, the Christian educator must actively engage with technological tools to foster environments where faith and learning coexist harmoniously. By integrating scriptural principles into the design and delivery of AI-based learning, these educators help preserve the holistic and redemptive purpose of Christian education. Thus, the study affirms that the involvement of Christian educators is not only necessary but foundational to the successful and ethically sound integration of AI in Nigeria's faith-based learning institutions.

This finding aligns with the position of Adebanjo (2018), who argues that Christian educators play a critical role in ensuring that technological innovations in education, such as AI, are guided by moral and spiritual values. As demonstrated in Table 2, the One-Sample T-Test analysis, based on responses from 232 participants, yielded a mean score of 3.0172 with a standard deviation of 1.06485, reflecting moderate variability in responses. The mean difference of 3.01724 from the hypothesized value indicates a statistically significant influence of Christian educators in shaping AI-enhanced learning environments in line with faith-based principles. This statistical outcome supports Williams' perspective, reinforcing the idea that Christian educators are not passive adopters of technology but active agents in aligning digital tools with biblical values. Therefore, the null hypothesis—which suggested no significant influence—was rightly rejected, affirming the indispensable role of Christian educators in this evolving educational landscape.

Conclusion

Drawing from the study's findings, it can be concluded that the integration of Artificial Intelligence into Nigeria's educational landscape presents both promising opportunities and profound ethical challenges, especially within faith-based institutions. As AI continues to influence how knowledge is delivered and assessed, the role of Christian educators becomes increasingly significant in shaping learning environments that reflect biblical values. These educators are uniquely positioned to ensure that AI tools do not merely enhance academic performance but also support the moral, spiritual, and ethical development of students. By promoting Christ-centered virtues such as truthfulness, justice, compassion, and humility, Christian educators act as stewards who bridge the gap between technological advancement and spiritual formation. Findings from this study affirm that Christian educators contribute meaningfully to the alignment of AI-enhanced learning with faith-based values through ethical leadership, curriculum design, content evaluation, and spiritual mentorship. Their ability to discern and respond to secular ideologies embedded in AI algorithms is vital in preserving the integrity of Christian education. However, challenges such as inadequate training, limited access to technology, and the absence of faith-integrated frameworks must be addressed to strengthen their influence. These issues point to the need for ongoing dialogue between educators, theologians, and technologists to ensure that Christian values remain central in the rapidly evolving digital learning space.

Christian educators in Nigeria have a critical role to play in guiding the ethical use of AI in education. Their influence goes beyond content delivery to shaping the moral compass of learners in AI-mediated environments. As education systems become increasingly digitized, their commitment to aligning innovation with Scripture will be essential for the development of learning environments that are not only technologically advanced but also spiritually grounded. Therefore, equipping Christian educators with the tools, training, and theological grounding necessary to engage with AI critically and creatively is both a strategic and moral imperative.

Recommendations

i. Christian educators should be actively involved in the selection, evaluation, and adaptation of AI tools to ensure they reflect biblical principles. They should also receive regular training on how to integrate faith-based values into AI-supported teaching methods while maintaining their role as moral and spiritual mentors within the classroom.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202537

ii. Curriculum planners in Christian institutions should collaborate with educators and technologists to develop AI-compatible curricula that embed Christian doctrines, ethical standards, and character-building objectives. This will ensure that AI-enhanced learning not only supports academic growth but also fosters spiritual and moral development.

References

Adebanjo, A. (2018). Ethical dimensions of student data use in Nigerian Christian schools. Journal of Faith and Ethics in Education, 13(2), 55–69.

Adeyemi, F. (2020). Faith, ethics, and artificial intelligence in education: A Christian perspective. Journal of Christian Educational Technology, 6(1), 45–59.

Anozie, C. (2023). Teaching digital ethics through a biblical lens in Nigerian secondary schools. African Journal of Christian Pedagogy, 9(1), 24–38.

Ejiofor, M. (2021). Bias in educational AI systems and the Christian educator's response. Journal of Technology and Christian Values, 6(3), 102–117.

Eze, C. (2022). Biblical worldview formation in AI-enhanced classrooms: The role of the Christian teacher. Nigerian Journal of Faith-Based Pedagogy, 9(2), 67–81.

Ibrahim, S. (2023). Harmonizing spirituality and technological innovation in Christian education. West African Journal of Theology and Learning, 12(1), 33–48.

Iwuagwu, T. (2017). Faith and technology: Toward a theology of AI in Christian education. Nigerian Journal of Religious Studies and ICT, 4(1), 89–104.

Mordi, J. (2020). Human agency and divine wisdom in the age of artificial intelligence. Journal of Christian Educational Leadership, 8(2), 121–136.

Musa, A. (2019). Theological reflections on artificial intelligence in Christian learning environments. Journal of Religious Ethics and Education, 5(3), 101–115.

Nwankwo, R. (2020). Relational pedagogy and AI: A Christian education perspective in Nigeria. West African Journal of Biblical Education, 7(1), 43–58.

Okon, J. (2021). Artificial intelligence in Nigerian schools: Challenges and opportunities for Christian educators. African Journal of Digital Faith Integration, 7(2), 24–39.

Oladimeji, F. (2021). Promoting equity in AI integration in Nigerian Christian schools. Christian Education Review, 15(4), 33–48.

Oloruntoba, K. (2022). Teachers as spiritual mentors in AI-enhanced classrooms. Journal of Theology and Educational Reform, 10(2), 71–86.

Uchenna, B. (2019). AI and the spiritual development of students in Nigeria. International Journal of Christian Education and Technology, 5(3), 97–112.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202538

Qualitative Study on Language Influence and Integration of Multilingualism in Teaching and Learning of English Language Studies in Nigeria

UGADUH, Lilian Chioma[1]
lilianugaduh@gmail.com
08064407963

EZE, Michael Chinweuba[1]
mikeeze4c@gmail.com
09150454862

OLATUNJI, Sheriff Olamide
olatunjisheriff07@gmail.com
0703459 3781

[1]Department of Arts and Social Sciences Education, National Open University of Nigeria

Abstract
The globalised world presents a unique challenge and opportunity for English language classrooms: the inclusion of multilingualism. This paper argues that embracing multilingualism in English language education is not only beneficial but necessary for fostering linguistic and cultural diversity, enhancing cognitive skills, and improving learning outcomes. Multilingual students bring a wealth of linguistic resources that, when effectively utilized, can enrich the learning environment and support the acquisition of English as an additional language. This paper explores the complex dynamics of language influence in multilingual classrooms, examining how students' native languages can positively impact their English learning process. It also discusses the pedagogical strategies that educators can employ to foster an inclusive environment that values and leverages linguistic diversity. Drawing on current research and educational theories, the paper provides recommendations for incorporating multilingualism into English language instruction, highlighting the importance of culturally responsive teaching practices. It argues that the inclusion of multilingualism not only benefits language acquisition but also contributes to broader educational goals, such as promoting social equity and intercultural understanding. The paper concludes by emphasizing the need for teacher training and policy support to fully realize the potential of multilingualism in English language classrooms.
Keyword: *Multilingualism, Language Influence, English Language Classrooms, Bilingual Education*

Introduction
In an increasingly interconnected world, multilingualism has become more than just a linguistic phenomenon; it is a vital component of social, cultural, and educational landscapes. The ability to communicate in multiple languages is a significant asset in a globalized society, fostering greater understanding and collaboration across diverse cultural contexts. Within the realm of education, particularly in English Language classrooms, the presence of multilingual students presents both challenges and opportunities. This paper explores the critical role of multilingualism in English Language education and argues that its inclusion is essential for fostering linguistic diversity, enhancing cognitive abilities, and achieving equitable educational outcomes. Historically, English Language education has often been characterized by a monolingual approach, where the use of languages other than English in the classroom has been discouraged or even prohibited. This approach, rooted in the belief that immersion in the target language is the most effective way to learn it, has dominated English Language Teaching (ELT) methodologies for decades (Auerbach, 1993). However, this monolingual bias overlooks the complex linguistic realities of today's classrooms, where students frequently speak multiple languages and bring diverse linguistic resources to their learning experiences. Research has shown that multilingualism can significantly enhance language learning, cognitive development, and academic achievement (Tan & Xun, 2023). For example, students who are proficient in more than one language often demonstrate greater cognitive flexibility, problem-solving skills, and metalinguistic awareness, all of which can contribute to more effective language learning (Bialystok, Craik & Luk, 2012). Moreover, the inclusion of multilingualism in the classroom can promote social equity by validating and valuing the linguistic and cultural identities of all students, particularly those from minority language backgrounds (Garcia & Wei, 2014).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202538

In light of these benefits, there has been a growing recognition of the need to move beyond monolingual approaches to teaching of the English language and embrace the linguistic diversity of students. This shift is not only necessary for improving language learning outcomes but also for fostering a more inclusive and culturally responsive educational environment. Multilingualism, defined as the ability to communicate in more than one language, is a common and natural phenomenon in many parts of the world. According to the United Nations Educational, Scientific and Cultural Organisation (UNESCO), more than half of the world's population is bilingual or multilingual, and this number is expected to grow as globalisation continues to influence patterns of migration, communication, and education (UNESCO, 2022). In educational contexts, multilingualism can be seen as both a challenge and an opportunity. On the one hand, the presence of multiple languages in the classroom can complicate teaching and learning processes, particularly when students have varying levels of proficiency in the target language. On the other hand, multilingualism can enrich the educational experience by exposing students to diverse linguistic and cultural perspectives, enhancing their cognitive abilities, and promoting intercultural understanding (Grain et al.2022).

Despite its potential benefits, the inclusion of multilingualism in English language classrooms is not without its challenges. One of the most significant challenges is the persistence of the monolingual bias in ELT methodologies. Many educators, particularly those trained in traditional language teaching approaches, may feel uncertain or unprepared to address the needs of multilingual students in their classrooms (de Jong, 2011). Additionally, the dominance of English as a global language can sometimes lead to the marginalization of other languages, particularly those spoken by minority or immigrant communities (Phillipson, 1992, as cited in Faiz, 2023). This can create a power imbalance in the classroom, where English is seen as the language of prestige and opportunity, while other languages are devalued or ignored. Another challenge is the lack of appropriate resources and materials for teaching in multilingual classrooms. Many English language textbooks and curricula are designed for monolingual learners and may not address the unique needs of multilingual students. For example, these materials may assume a certain level of proficiency in English or a specific cultural background, which may not be applicable to all students. This can make it difficult for educators to provide meaningful and relevant instruction to all learners, particularly those who are still developing their proficiency in English (García & Lin, 2017). Despite these challenges, there are numerous opportunities for leveraging multilingualism to enhance learning of the English language. One of the most important opportunities is the use of students' native languages as a resource for learning English. Research has shown that students who are able to use their native language as a scaffold for learning English often perform better academically and achieve higher levels of proficiency in the target language (Cummins, 2007). This is because students can draw on their existing linguistic knowledge and skills to make sense of new language concepts, rather than having to learn them from scratch.

Another opportunity is the promotion of translanguaging practices in the classroom. Translanguaging, a pedagogical approach that encourages students to use their entire linguistic repertoire to communicate and learn, has been shown to be highly effective in multilingual classrooms (García & Wei, 2014). For example, students might be encouraged to use their native language to discuss a complex concept with a classmate before presenting it in English. This not only helps to build students' confidence and competence in English but also validates and values their linguistic and cultural identities. In addition to these pedagogical strategies, there is also an opportunity to promote multilingualism through culturally responsive teaching practices. Culturally responsive teaching, which involves recognizing and valuing students' cultural backgrounds and incorporating them into the curriculum, can help to create a more inclusive and supportive learning environment (Gay, 2018). For example, educators might incorporate literature, music, and other cultural artifacts from students' native cultures into their lessons, or use examples and case studies that reflect the diverse experiences and perspectives of their students. This not only enhances students' engagement and motivation but also promotes intercultural understanding and respect. To fully realize the potential of multilingualism in English language classrooms, it is essential that educators receive adequate training and support. This includes professional development opportunities that focus on multilingual pedagogy, as well as access to resources and materials that are designed for use in multilingual classrooms. Additionally, there is a need for policies that support the inclusion of multilingualism in education, such as the development of bilingual or dual-language programs, the provision of language support services for students, and the recognition of multilingualism as a valuable asset in the classroom (Saikham, 2025). Ultimately, the inclusion of multilingualism in English Language classrooms is not just a pedagogical issue but a matter of social justice. By recognizing and valuing the linguistic and cultural diversity of students, educators can help to create a more equitable and inclusive educational environment. This not only benefits individual students but also contributes to the broader goal of promoting intercultural understanding and social cohesion in an increasingly diverse and interconnected world.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202538

The Impact of Learning English on Nigerian Education System

Multilingual students bring a wealth of linguistic resources to the classroom that can significantly impact their English learning process. These resources include not only their proficiency in their native languages but also their cultural knowledge, cognitive skills, and learning strategies. Understanding how these factors influence learning of English is essential for developing effective pedagogical approaches that leverage the strengths of multilingual students while addressing their specific needs.

Cognitive Benefits of Multilingualism among Students in Nigeria

One of the most significant ways in which multilingualism influences English learning is through its impact on cognitive development of students. Research has shown that individuals who are proficient in more than one language often demonstrate greater cognitive flexibility, problem-solving skills, and metalinguistic awareness compared to monolingual individuals (Bialystok, 2001). These cognitive benefits can enhance students' ability to learn and process new information, including the acquisition of a new language. For example, multilingual students often have a heightened awareness of the structure and function of language, which can help them to recognize patterns and make connections between their native language and English. This metalinguistic awareness can facilitate the learning of grammar and vocabulary, as students are able to draw on their existing linguistic knowledge to make sense of new language concepts (Cummins, 2007). Additionally, the cognitive flexibility associated with multilingualism can enable students to switch between languages more easily, which can be particularly beneficial in a classroom where both the native language and English are used for instruction.

Cross-Linguistic Transfer in Teaching and Learning of English Language in Nigerian

Another important aspect of language influence in multilingual classrooms is the concept of cross-linguistic transfer, which refers to the process by which knowledge and skills from one language are transferred to another. This transfer can occur at various levels, including phonological, lexical, syntactic, and pragmatic, and can significantly impact the learning of a new language (Saikham, 2025). For example, a student who is proficient in Spanish may find it easier to learn English vocabulary that is similar to Spanish, such as "information" and "información," due to the similarities between the two languages. Cross-linguistic transfer can also occur in the opposite direction, where students apply English language structures or vocabulary to their native language. While this transfer can sometimes lead to errors or interference, it can also provide valuable insights into the similarities and differences between languages, enhancing students' overall language learning experience. For example, a student who is learning English as a second language may begin to recognize the similarities between English and their native language in terms of sentence structure or word order, which can help to reinforce their understanding of both languages.

Challenges of Language Influence in Teaching and Learning of English Language in Nigeria

While the cognitive benefits and cross-linguistic transfer associated with multilingualism can enhance English learning, it is important to recognize that language influence can also present challenges. One of the most common challenges is language interference, where the structures or rules of the native language interfere with the learning of English. For example, a student who is a native speaker of a language with a different word order than English may struggle with sentence structure or grammar, leading to errors or confusion. Another challenge is the potential for negative transfer, where students apply rules or patterns from their native language to English inappropriately. For example, a student who speaks a language that does not differentiate between certain sounds or phonemes may have difficulty with English pronunciation, leading to misunderstandings or miscommunication. Negative transfer can also occur at the syntactic level, where students may apply the sentence structures or word order of their native language to English, resulting in errors or awkward phrasing. To address these challenges, it is essential for educators to be aware of the potential for language interference and negative transfer in multilingual classrooms and to provide targeted support to help students overcome these obstacles. This may include explicit instruction in the differences between English and the students' native languages, as well as opportunities for practice and feedback to reinforce correct language use.

Strategies for Incorporating Multilingualism into the Classroom in Nigeria

To fully realize the benefits of multilingualism in English language classrooms, it is essential for educators to adopt pedagogical strategies that value and leverage students' linguistic diversity. This section explores a range of strategies that can be used to incorporate multilingualism into the classroom, including translanguaging, culturally responsive teaching, and the use of students' native languages as a resource for learning English.

Translanguaging as a Pedagogical Strategy in Nigeria

One of the most effective strategies for incorporating multilingualism into the classroom is the use of translanguaging, a pedagogical approach that encourages students to use their entire linguistic repertoire to communicate and learn. Translanguaging recognises that multilingual students do not simply switch between languages but rather use all of their linguistic resources in an integrated and dynamic way (García & Wei, 2014). This approach can be particularly beneficial in

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202538

multilingual classrooms, where students may have varying levels of proficiency in English and their native languages. For example, in a translanguaging classroom, students might be encouraged to use their native language to discuss a complex concept with a classmate before presenting it in English. This not only helps to build students' confidence and competence in English but also validates and values their linguistic and cultural identities. Translanguaging can also be used to scaffold learning, where students use their native language to support their understanding of new English language concepts. For example, a teacher might provide bilingual glossaries or translation exercises to help students make connections between their native language and English vocabulary.

Culturally Responsive Teaching of English Language in Nigeria

Another important strategy for incorporating multilingualism into the classroom is culturally responsive teaching, which involves recognizing and valuing students' cultural backgrounds and incorporating them into the curriculum. Culturally responsive teaching is based on the idea that students learn best when they feel that their cultural identities are recognized and respected in the classroom (Gay, 2018). This approach can help to create a more inclusive and supportive learning environment, particularly for students from minority language backgrounds. For example, educators might incorporate literature, music, and other cultural artifacts from students' native cultures into their lessons, or use examples and case studies that reflect the diverse experiences and perspectives of their students. This not only enhances students' engagement and motivation but also promotes intercultural understanding and respect. Culturally responsive teaching can also involve the use of students' native languages as a resource for learning English, such as by encouraging students to draw on their cultural knowledge and experiences when discussing or writing about topics in English.

Using Native Languages as a Resource for English Language Teaching in Nigeria

One of the most powerful ways to incorporate multilingualism into the classroom is by using students' native languages as a resource for learning English. Research has shown that students who are able to use their native language as a scaffold for learning English often perform better academically and achieve higher levels of proficiency in the target language (Cummins, 2007). This is because students can draw on their existing linguistic knowledge and skills to make sense of new language concepts, rather than having to learn them from scratch. There are several ways that educators can use students' native languages as a resource in the classroom. One approach is to provide bilingual materials, such as bilingual glossaries, dictionaries, or texts, that allow students to see the connections between their native language and English. Another approach is to encourage students to use their native language when working on assignments or projects, particularly in the early stages of learning English. For example, students might write a draft of an essay in their native language before translating it into English, or they might discuss a complex topic in their native language before presenting it in English. In addition to these strategies, educators can also use students' native languages to support the development of academic language skills in English. For example, a teacher might introduce new vocabulary words in both English and the students' native language, or provide explanations of complex concepts in both languages. This not only helps students to understand the material more fully but also reinforces their native language skills, which can support their overall academic achievement.

Challenges of Incorporating Multilingualism into the Classroom in Nigeria

While there are many benefits to incorporating multilingualism into the classroom, it is important to recognize that this approach is not without its challenges. One of the most significant challenges is the lack of appropriate resources and materials for teaching in multilingual classrooms. Many English language textbooks and curricula are designed for monolingual learners and may not address the unique needs of multilingual students. For example, these materials may assume a certain level of proficiency in English or a specific cultural background, which may not be applicable to all students (García & Lin, 2017). Another challenge is the persistence of the monolingual bias in ELT methodologies. Many educators, particularly those trained in traditional language teaching approaches, may feel uncertain or unprepared to address the needs of multilingual students in their classrooms (De Jong, 2011). This can lead to a reluctance to incorporate students' native languages into the classroom or to adopt pedagogical strategies that value and leverage linguistic diversity. To address these challenges, it is essential for educators to receive adequate training and support in multilingual pedagogy. This includes professional development opportunities that focus on the use of translanguaging, culturally responsive teaching, and other strategies for incorporating multilingualism into the classroom. Additionally, there is a need for the development of resources and materials that are designed specifically for use in multilingual classrooms, as well as policies that support the inclusion of multilingualism in education.

The Role of Policy and Teacher Training in Supporting Multilingual Education in Nigeria

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202538

The successful incorporation of multilingualism into English language classrooms requires more than just the adoption of new pedagogical strategies; it also requires the support of policies and teacher training programs that recognise and value linguistic diversity. This section explores the role of policy and teacher training in supporting multilingual education and provides recommendations for how educators and policymakers can work together to create a more inclusive and equitable educational environment.

The Role of Policy in Supporting Multilingual Education in Nigeria

Policies that support the inclusion of multilingualism in education are essential for creating an environment where linguistic diversity is valued and leveraged as a resource for learning. One of the most important policy initiatives in this area is the development of bilingual or dual-language programs, which provide instruction in both the students' native language and English. These programs have been shown to be highly effective in promoting academic achievement and English language proficiency, particularly for students from minority language backgrounds (Saikham, 2025). In addition to bilingual programs, other policy initiatives that support multilingual education include the provision of language support services for students, such as English as a Second Language (ESL) programs, and the recognition of multilingualism as a valuable asset in the classroom. For example, some schools and districts have implemented policies that allow students to earn credit for proficiency in a language other than English or that offer special recognition or awards for multilingual students. Another important policy consideration is the need for equitable funding for multilingual education programs. In many cases, schools and districts that serve a high number of multilingual students receive less funding than those that serve primarily monolingual students, which can limit their ability to provide the necessary resources and support. To address this issue, it is essential for policymakers to ensure that funding is allocated equitably and that schools have the resources they need to support multilingual students.

Teacher Training and Professional Development in Promoting Multilingual Education in Nigeria

Teacher training is another critical component of supporting multilingual education. Educators who are trained in multilingual pedagogy are better equipped to address the needs of multilingual students and to create a classroom environment that values and leverages linguistic diversity. This training should include both pre-service and in-service professional development opportunities, as well as ongoing support and resources for educators. One of the most important areas of teacher training is the development of cultural competence, which involves recognizing and valuing the cultural backgrounds and experiences of students. This includes understanding the role of language in shaping cultural identity and being able to incorporate students' cultural knowledge and experiences into the curriculum. Additionally, educators should be trained in the use of pedagogical strategies that support multilingualism, such as translanguaging and culturally responsive teaching. Another important area of teacher training is the development of language proficiency in the students' native languages. While it is not always possible for educators to be proficient in all of the languages spoken by their students, it is important for them to have a basic understanding of the students' linguistic backgrounds and to be able to provide support and resources in the students' native languages. This may include training in the use of bilingual materials, translation tools, and other resources that can help to bridge the language gap between English and the students' native languages.

Recommendations for Supporting Multilingual Education in Nigeria

To fully realize the potential of multilingualism in English language classrooms, it is essential for educators, policymakers, and other stakeholders to work together to create a more inclusive and equitable educational environment. This includes the development of policies and programs that support the inclusion of multilingualism in education, as well as the provision of training and resources for educators. One of the most important recommendations is the development of bilingual or dual-language programmes that provide instruction in both the students' native language and English. These programmes have been shown to be highly effective in promoting academic achievement and English language proficiency, particularly for students from minority language backgrounds. Additionally, it is important to ensure that these programs are adequately funded and supported, with access to appropriate resources and materials. Another important recommendation is the provision of professional development opportunities for educators that focus on multilingual pedagogy. This includes training in the use of translanguaging, culturally responsive teaching, and other strategies for incorporating multilingualism into the classroom. Additionally, it is important to provide ongoing support and resources for educators, including access to bilingual materials, translation tools, and other resources that can help to bridge the language gap between English and the students' native languages. Finally, it is essential to promote a broader recognition and appreciation of multilingualism as a valuable asset in the classroom. This includes the development of policies and programs that recognize and reward multilingual students for their language proficiency, as well as efforts to raise awareness of the benefits of multilingualism for all students.

Conclusion

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202538

The inclusion of multilingualism in English language classrooms is not merely a pedagogical choice; it is a fundamental necessity for fostering linguistic diversity, enhancing cognitive abilities, and promoting social equity. In today's increasingly globalized world, where multilingualism is the norm rather than the exception, educational practices must evolve to reflect the linguistic realities of the student population. This paper has explored the various ways in which language influence and multilingualism can be incorporated into English language classrooms, highlighting the benefits of a multilingual approach and offering strategies for educators and policymakers to support this inclusion. One of the central arguments presented in this article is that multilingualism should be seen as a resource rather than a challenge. Students who speak multiple languages bring a wealth of linguistic and cultural knowledge to the classroom that can enrich the learning experience for everyone. By leveraging these resources through strategies such as translanguaging and culturally responsive teaching, educators can enhance students' English language acquisition while also promoting a more inclusive and supportive learning environment. However, the successful integration of multilingualism into English language education requires more than just the adoption of new teaching strategies; it also necessitates systemic changes in policy and teacher training. Policies that support bilingual education and provide adequate resources for multilingual students are essential for creating an environment where linguistic diversity is valued and leveraged as a resource for learning. Additionally, teacher training programs must be designed to equip educators with the skills and knowledge needed to address the unique needs of multilingual students and to create a classroom environment that values and respects linguistic diversity. The challenges associated with incorporating multilingualism into English language classrooms should not be underestimated. The persistence of the monolingual bias in ELT methodologies, the lack of appropriate resources and materials, and the need for adequate teacher training all represent significant obstacles to the successful integration of multilingualism. However, these challenges are not insurmountable. With the right support and resources, educators can overcome these obstacles and create a learning environment that is not only inclusive of multilingualism but also celebrates and leverages it as a valuable asset. Ultimately, the inclusion of multilingualism in English language classrooms is about more than just language learning; it is about promoting social equity and intercultural understanding. In a world where linguistic and cultural diversity are increasingly valued, it is essential for educational practices to reflect and support these values. By recognizing and valuing the linguistic diversity of students, educators can help to create a more equitable and inclusive educational environment that benefits all students. This article concludes with a call to action for educators, policymakers, and other stakeholders to take bold and decisive steps to support the inclusion of multilingualism in English language education. This includes the development of policies and programs that support bilingual education, the provision of professional development opportunities for educators, and the promotion of a broader recognition and appreciation of multilingualism as a valuable asset in the classroom. By working together, we can create a learning environment that is not only inclusive of multilingualism but also celebrates and leverages it as a powerful tool for learning and growth.

Acknowledgements

The authors of this paper express their gratitude and indebtedness to all scholars and researchers whose work were cited in this paper.

References

Auerbach, E. R. (1993). Re-examining English only in the ESL classroom. *TESOL Quarterly*, *27*(1), 9-32.

Bialystok, E. (2001). *Bilingualism in development: Language, literacy, and cognition*. Cambridge University Press.

Bialystok E, Craik FI, Luk G. Bilingualism: Consequences for mind and brain. *Trends in Cognitive Sciences.* 2012;16:240–250.

Cummins, J. (2007). Rethinking monolingual instructional strategies in multilingual classrooms. *Canadian Journal of Applied Linguistics*, *10*(2), 221-240.

De Jong, E. J. (2011). *Foundations for multilingualism in education: From principles to practice*. Caslon Publishing.

Faiz, U. (2023). Linguistic Imperialism in the Globalized World: Examining English Dominance and its Sociolinguistic Consequences. Harf-o-sukhan, 7(3), 279–288.

García, O., & Wei, L. (2014). *Translanguaging: Language, bilingualism and education*. Palgrave Macmillan.

García, O., & Lin, A. M. Y. (2017). *Bilingual and multilingual education*. In O. García, A. M. Y. Lin, & S. May (Eds.), *Encyclopedia of language and education* (pp. 1-14). Springer.

Gay, G. (2018). *Culturally responsive teaching: Theory, research, and practice* (3rd ed.).Teachers College Press.

Grain, H. M. J. S., Al-gburi, G., Suleiman, O. W., Kadhim, A. J., Hassan, A. Y., & Dawood, I. I. (2022). Impact of English language proficiency, multilingualism and perceived language difficulties on international student's academic performance in Iraq. *Eurasian Journal of Applied Linguistics*, 8(2), 160-170.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202538

Hornberger, N. H. (2003). *Continua of biliteracy: An ecological framework for educational policy, research, and practice in multilingual settings*. Multilingual Matters.

Menken, K., & García, O. (2010). *Negotiating language policies in schools: Educators as policymakers*. Routledge.

Phillipson, R. (1992). *Linguistic imperialism*. Oxford University Press.

Saikham, S. (2025). Linguistic Diversity and Language Policies in Thai Education: Challenges and Opportunities in Multilingual Classrooms. Insights into Modern Education (i-ME).

Tan, Y. Z., & Xun, M. Y. (2023). The Impact of Multilingual Education on Students' Cognitive Development: Evidence from the China. *Journal of Education*, *6*(2), 13-21.

Thomas, W. P., & Collier, V. P. (2002). *A national study of school effectiveness for language minority students' long-term academic achievement*. Center for Research on Education, Diversity & Excellence.

United Nations Educational, Scientific and Cultural Organization. (2022). *Global Language Report 2022*.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202539

Effects of Virtual-Field-Trip and Field-Experience Strategies on Performance in Air Pollution among College of Education Students in Akwa Ibom State, Nigeria

AKPAN, Anyanime Okopide[1]
anyanimeakpan@aksu.edu.ng
08023319141

UMANAH, Felicia Imeh[1]
feliciaumanah@aksu.edu.ng
07088885603

ABASI, Andrew Umo[1]
andrewumoeka@gmail.com
08033632264

[1]Department of Science Education, Akwa Ibom State University, Ikot Akpaden, Mkpat Enin LGA, Nigeria

Abstract
The study investigated the effects of virtual-field-trip and field-experience strategies on performance in air pollution among college of education students in Akwa Ibom State, Nigeria. Two research questions and hypotheses guided the study. Quasi experimental pretest, post-test design with two groups was adopted for the study. The population comprised 261-year one Integrated Science and Biology students, taking the course ISC 114: Component of the Environment 1, (99 males and 162 females) in Akwa Ibom State College of Education, Afaha Nsit. Multistage sampling technique was used to select 102 students for the study. The students were assigned into two groups. Group one had 53 students (15 males and 38 females) taught with Virtual field trip, while Group two, had 49 students (20 males and 29 females) taught with field experience. The instrument for data collection was the Field Trip Performance Test (FTPT) with a reliability coefficient of 0.80 and the data collected were analysed. The research questions were answered using mean and standard deviation, while Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. Results showed that, there was significant effects of instructional strategies on the performance of the students taught using virtual field trip over those taught with conventional field experience. There was no significant effect of gender on academic performance. It was recommended among others that innovative teaching strategies that will engender interest and creativity in the students should be encouraged for teaching Pre-service teachers.

Key words: Virtual-field trip, Field-experience, pre-service teacher, air pollution

Introduction
Basic Science and technology, formerly Integrated science is a fundamental subject in the primary and junior secondary school curricula. It serves as a crucial foundation for further studies in the science subjects also as a step towards presenting science to the child, making them develop interest in science and technology (Akpan, 2022), as well as prepare the students for future careers in science related fields and acquire knowledge and skills. The subject is taught in an integrated manner, aiming to provide a cohesive understanding of scientific principles and concepts at this early stage of education (Mbonu-Adigwe, et.al, 2024). The problem of poor performance in school work and public examinations in the sciences seems to loom because Basic Science and Technology the foundation is taught at abstract level by some teachers. In view of above, the Federal Government of Nigeria (2013) in the national policy on education prescribe the use of guided inquiry method of teaching through activities and resources from the learners' environment. Etiubon, et al., (2021) opined that effective science teaching will enhance learners' understanding and acquisition of basic science skills and that a science teacher can achieve this through effective teaching methods, by utilization of teaching materials/resources. According to Umoetuk and Akpan (2023); George and Abasi (2025), when a teacher teaches with effective technique, it will help the students to develop their skills and experience and will also provide opportunity for the students to actively participate in the teaching process. It also offers opportunity for teachers to transmit meaningful learning to reverse poor academic performance of students in the subject (Umanah & Akpan, 2024)

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202539

In spite of the emphasis on the approach of Basic Science and Technology teaching, there still exist complaints on students' poor academic performance. This poor achievement might be due to the poor method of teaching used by the teacher without students' participation. Akanwa, et.al (2018), reported that the failure rate in the sciences was a reflection of a disconnect between the teachers and their students. Akpan and Akpan (2017) opined that there is a need for teachers to identify teaching approaches that are activity- based such as field trips (virtual field trip, physical field trip or field experience) in which students can participate, relate, share ideas and interact within themselves. Globally, the pattern of teaching and learning is changing, for example, some scientific concepts (such as weather phenomena, human internal structure, outer space and many others) are abstract and difficult to teach/learn through concrete and direct observation. The covid-19 in particular institutionalized the application of digital technologies in education creating a paradigm shift in teaching and learning, thus making the classroom more engaging, compelling and interesting (Akpan, et al., 2023). Virtual field trip is one of such technology integrated into the classroom.

Curriculum changes with the needs, challenges and aspiration of the society, that is why issues like environmental changes are introduced to infuse emergent global issues of concern (Akpan, 2016). The application of science and technology has greatly impacted human life positively in various areas, such as health, agriculture, communication and information These developments have also impacted the environment negatively, one of such negative effect is air pollution. Air pollution is found in all science and school curricula (NERDC, 2012) and (FRN, 2008) due to its significance and importance to the health and economy of the nation. Gender is a socially constructed role, behaviour or expectations associated with being male or female. It is one of the variables that influence students' academic performance in school, thus highlighting the need for review from time to time (Itighise & Umanah, 2019; Umanah & Akpan, 2025).

Conceptual Considerations

Virtual Field Trip (VFT): is an educational experience where students explore places, events or concepts using digital technology without leaving the classroom or home. For example, touring the rain forest, solar system etc. This trip uses multi-media tools like videos, live streams, virtual reality, interactive websites to simulate a real-world experience (Gambari et al., (2018). According to Hope, et.al., (2024), VFT is a guided exploration through the world wide web that organizes a collection of pre-screened, thematically based web pages into a structured online learning experience. It helps in online access, students visit sites and natural environment or outer space via internets According to Akpan (2016), it is applied in environmental study to conduct a field trip to a pollution site. VFT is interactive in nature, it is cost effective, and reduces associated cost of planning a physical field trip. It is visual and interactive content makes learning engaging. Obadiora (2016) and Lawal (2023) observed that students taught with VFT performed significantly better than the experimental group taught with traditional field trip method. Likewise, Gambari, et al. (2018} showed that students taught chemistry using virtual laboratory instructions performed better than their counterpart. Eden, et al., (2023) observed that students taught soap production using virtual laboratory approach performed better than those taught using hands-on activity approach.

Field Experience: Physical or real field trip or educational trips is learning done outside the classroom and laboratory. It is an outdoor experience or out of class exercise undertaken by teachers and students in certain aspects of some subject (Akpan, 2016). Egwu and Okigbo (2021) noted that practical work need not be only laboratory based, but in many cases, it is more effective to deploy field work or use community resources as practical work provides the most effective means by which understanding and comprehending of scientific concepts can be improved. It enables students to reason out the scientific ideas which are contained within the various activities, thus make them to become critical thinkers. The learners are then guided to find information and understand concept through appropriate activities and demonstrations which encourages them to discover patterns leading to a more retentive instruction (Ado & Abasi, 2014). The essence of field experience is usually observational and expose them to actual hands-on learning experiences. It provides first-hand experience, stimulate interest, motivate, as well as perception skills, personal development and interrelationship (Akpan & Akpan, 2017). Oyediran (2023) found that if organized and worded properly, field trip strategy may have beneficial impact for leaners and observed that the use of field trip teaching strategy is seem to be more effective than the conventional method of teaching in enhancing students' performance. Njoku and Mbgomo, (2021) noted that field trip teaching method enhanced students' achievements in biology better than demonstration method, and there was no significant difference in the performance of male and female students taught with the method. Egwu & Okigbo, (2021), also found that the use of field trip method in teaching is more effective in enhancing students' achievement in ecology than lecture method. And there was no significant difference in male and female students' performance on the concept. Danjuma and Andrew (2024) noted that field trip mode of instructions was more effective than inquiry based

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202539

on biology students' performance and there was no significant difference between the performance of male and female students taught ecology as the methods used enhanced students' performance.

Air Pollution: Air is polluted when any foreign or additional substance is added to its normal composition. It is the contamination of the atmosphere with undesirable solids, liquids and gases (Akpan, 2016). It is the release of harmful substances into the air as a result of various human activities (Akpan, et al., 2018). Air contains many gaseous substances invisible to the human eye, such as compounds of carbon, sulphur, nitrogen, metals, chlorofluorocarbons and suspended particulate matter (Akpan, et al., 2019). Teaching air pollution is important because it addresses environmental issues such as greenhouse gases, climate change, acid rains, global warming and their implications on the environment, health, biodiversity and agriculture. Teaching the concept also helps students acquire necessary skill in solving environmental and ecological problems (Akpan & Udo, 2016). However, there is difficulty in teaching air pollution, as it is abstract in nature and difficult to visualize air, therefore it requires innovative approach like activity- based (Akpan & Akpan, 2017) and field trips in teaching.
Gender: Gender differences in academic achievement in science has been a long-debated issue. Various studies like Ukpai and Fomsi (2023) and Olatunde-Aiyedun (2021) have found that male students perform better than their female counterparts and are more likely to take difficult subject areas and challenging problems. Umoetuk and Akpan (2023) found that females performed better than the males in Basic Science and Technology, while Akanwa, et al., (2018) reported that female students performed better than the males in biology. Gambari et al (2018) observed that female students performed better than male counterpart when taught using virtual field trip. Oyakhirome and Akpan (2024); Etiubon, et al (2021) and Eden, et al., (2023) found that there was no significant difference in male and female students' academic performance in chemistry and gender is a non-significant factor in academic achievement of students.

The poor performance of students in the sciences raises doubts on the teaching of Basic Science and Technology the foundation of the sciences and the efficacy of the instructional approaches used by teachers. One of the key factors contributing to poor students' achievement is the use of traditional, teacher-centred instructional methods by Integrated Science teachers, which often fail to promote active learning, deeper understanding of science concepts, critical thinking, and real-world application of scientific concepts. These approaches leave many students with superficial understanding of science, resulting in low motivation, limited interest and low academic achievement. In order to address the challenges of students' poor performance and teachers' capacity building, as no education can rise above the quality of its teacher, it is advocated that science teachers should use innovative and student-centred teaching and learning strategies like virtual field trip and field experience for improved students' academic achievement. Several researchers lay claims to the effectiveness of field trips in enhancing the performance of students. The application of combined field experience and virtual field trip teaching strategies is minimal with limited empirical evidence. The question is, will the use of virtual field trip and field experience strategies enhance Pre-Service teachers' academic performance? This study, therefore sought to investigate the effect of teaching air pollution to Pre-service Integrated Science teachers in Akwa Ibom State College of Education using virtual field trip and field experience strategies.

Purpose of the Study

The study was carried out to investigate the effects of virtual-field-trip and field-experience strategies on performance in air pollution among college of education students Specifically, the study sought to:

1. Determine the performance scores of students taught air pollution concept using Virtual-Field-trip strategy and those expose to field experience strategy in Akwa Ibom State College of Education.
2. Ascertain the performance scores of male and female students taught air pollution concept using Virtual-Field-trip strategy and those expose to field experience strategy in Akwa Ibom State College of Education.

Research Questions

The following research questions were formulated to guide the study:

1. What are mean scores of students taught air pollution concept using Virtual-Field-trip strategy and those expose to field experience strategy in Akwa Ibom State College of Education.
2. What are mean scores of male and female students taught air pollution concept using Virtual-Field-trip strategy and those expose to field experience strategy in Akwa Ibom State College of Education.

Research Hypotheses

Ho_1: There is no significant difference between the mean performance scores of students taught air pollution concept using virtual-field-trip strategy and those expose to field-experience strategy in Akwa Ibom State College of Education.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202539

Ho_2: There is no significant difference between the mean performance scores of male and female students taught air pollution concept using virtual-field-trip strategy and those expose to field-experience strategy in Akwa Ibom State College of Education.

Methodology

Quasi experimental pretest-posttest design, with two groups was adopted for the study. Experimental group one was taught the concept of air pollution with (VFT), while the experimental group two was taught with Field Experience (FE). The research was done in Akwa Ibom State College of Education, Afaha Nsit, Akwa Ibom State Nigeria. The population of the study comprised 261 year one NCE Integrated Science and Biology students (99 males and162 females) taking the course ISC 114: Component of the Environment 1. The sample for the study consisted of 102 Integrated Science students in their intact class purposively sampled from the population. The students were randomly assigned into two groups. Group 1 had 53 students (15 males and 38 females) taught with VTF, while Group 2, had 49 students (20 males and 29 females) taught with FE. The instrument for data collection was the Field Trips Performance Test (FTPT) on the concept of air pollution. FTPT had two sections A and B, Section A contained demographic information on school, department and gender, while section B contained twenty-five (25) multiple choice test items. Each question had four options lettered A-D, with one correct option among three distractors. Two (2) marks were awarded to each question answered correctly. The overall marks for the test were 50 marks The instrument was validated by two assessors in order to check for appropriateness, clarity and adequacy in addressing the objectives of the study. The reliability index of the instrument was determined by administering the FTPT to 25 students within the population that were not used for the main study. Data obtained were analyzed, using Kuder-Richardson's formula 20, from the analysis, a reliability coefficient of 0.80 was obtained. Before commencement of treatment, a pretest was administered to establish a baseline for students' prior knowledge on the concept and as covariate in assessing the performance of students on the concept after treatment. After three weeks treatment using both teaching strategies, the post-test, a reshuffled (FTPT) was administered to the two groups. The test scripts were collected, marked and the post-test scores obtained and recorded. The same procedure was done with the pretest. Data collected from pretest and post-test measurements were analyzed using mean, standard deviation and analysis of covariance (ANCOVA). All the hypotheses formulated for the study were tested at .05 alpha level of significance.

Presentation of Results

The two research questions and hypotheses raised were answered below.

Research Question 1

What are mean scores of students taught air pollution concept using Virtual-Field-trip strategy and those expose to field experience strategy in Akwa Ibom State College of Education.

Table 1: Mean and standard deviation scores of the students' on pretest and posttest classified by teaching strategies

Teaching Strategies	Sample Size	Pretest		Posttest		Mean Difference
		Ẍ	SD	Ẍ	SD	
Virtual Field Trip	53	35.17	13.99	61.02	14.47	25.85
Field Experience	49	27.18	14.29	47.22	16.85	20.04

Data collected 2023/2024 Session.

The results in Table 1 show that students taught using VFT had posttest - pretest mean difference of 25.85 while those taught with Field Experience had 20.04. This observation shows that students taught using virtual field trip strategy performed better than those taught with field experience.

Research Question 2

What are mean scores of male and female students taught air pollution concept using Virtual-Field-trip strategy and those expose to field experience strategy in Akwa Ibom State College of Education.

Table 2: Mean and standard deviation scores of male and female students' on pretest and posttest classified by teaching strategies

Teaching Strategies	Gender	Sample Size	Pre-test		Post-test		Mean Difference
			Ẍ	SD	Ẍ	SD	

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202539

Virtual Field Trip	Male	15	36.40	14.60	63.60	14.66	27.20
	Female	38	34.68	13.91	60.00	14.46	25.32
Field Experience	Male	20	27.18	13.52	43.50	14.62	16.42
	Female	29	29.52	14.58	49.79	18.03	20.27
Overall	Male	35	31.33	15.16	54.39	17.60	23.06
	Female	67	29.20	14.32	52.11	16.76	23.91

Data collected 2023/2024 Session.

Research question 2, the posttest - pretest mean difference of 27.20; 25.32 for male and female students in the VFT group and 16.42; 20.27 for the male and female students in field experience group respectively displayed in Table 2 show that the male students taught using VFT had better performance compared to their female counterparts while in FE group, the females had better performance than their male counterpart. The overall performance observed indicated female superiority with mean score difference of 23.91 over the male 23.06.

Hypothesis One: There is no significant difference between the mean performance scores of students taught air pollution concept using virtual-field-trip strategy and those expose to field-experience strategy in Akwa Ibom State College of Education.

Table 3: Summary of analysis of covariance (ANCOVA) of students' posttest scores classified by teaching strategies with pretest as covariate

Source of Variation	Sum of Squares	Df	Mean Square	F-cal	F-crit	Sig.	Decision at p<.05
Covariate: *Pre-test*	19231.92	1	19231.92	360.35	3.92	.00	S
Main Effects:						.	
Teaching Strategies	836.13	1	836.13	15.67*	3.92	00	S
Error	5283.60	99	53.370	-	-	-	-
Total	29360.31	101	-	-	-	-	-

*Significant @ 0.05 level of significance

In Table 3, the calculated F-ratio for the effect of teaching strategies on the performance of students when taught the concept of air pollution at df 1, 99 is 15.67, while its corresponding calculated level of significance is .00 alpha and the F-crit is 3.92. The F-cal, 15.67 is greater than the F-crit. 3.92, at 0.05 alpha, indicating that the teaching strategies used had statistically significant effect on the performance of students in the concept of air pollution when taught using virtual field trip and field experience. Hence, Hypothesis one which assumed no significant difference between the performances of the students in the concept was rejected.

Hypothesis Two (HO_2): There is no significant difference between the mean performance scores of male and female students taught air pollution concept using virtual-field-trip strategy and those expose to field-experience strategy in Akwa Ibom State College of Education. **Table 4: Summary of analysis of covariance (ANCOVA) of students' posttest scores classified by teaching strategies and gender with pretest as covariate**

Source of Variation	Sum of Squares	df	Mean Square	F-cal	F-crit	Sig.	Decision at p<.05
Covariate: *Pre-test*	18669.14	1	18669.14	345.71	3.92	.00	S
Main Effects:							
Teaching Strategies	866.13	1	866.13	16.04	3.92	.00	
Gender	8.296	1	8.296	.15	3.92	.70	
2-Way Interaction							
*Teaching Strategies * Gender*							
Residual	38.41	1	38.41	.71*	3.92	.40	
Total	5238.22	97	54.00				
	29360.31	101					

*Not significant @ 0.05 level of significance

The results in Table 4 shows that the calculated F-ratio teaching strategies*gender on the performance of students at df 1,97 is .71, while its corresponding calculated level of significance is .40 alpha and its F-crit is 3.92. The calculated F value of .71 is less than the F-crit. 3.92 at 0.05 alpha under 1, 97 degrees of freedom, indicating that gender had no statistically significant

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202539

effect on the performance of students when taught the concept of air pollution using virtual field trip and field experience strategies. Hence, hypothesis two which assumed no significant difference between the performances of the students in the concept based on gender was upheld.

Discussion of Findings

With respect the performance of NCE Integrated Science students on the concept of air pollution when taught using VFT and FE, though both are tasks structures, they offer excitement and first-hand experiences to the learners, which facilitate their understanding of the subject matter taught. The results in Tables 1 and 3 showed that there was a statistically significant difference in favour of those taught using VFT. The observed better performance by the students taught using VFT is explained in terms of virtual devices, packages and resources being easily available and accessible for teaching. The strategy is stress free, exploratory and more conducive to undertake than the laborious outdoor field experience and equipment. Today's students are digital natives so watching the videos simulated on computers and hand-held devices and practicing many times stimulate students' achievement in the concept taught. The finding is in agreement with that of Obadiora (2016); Gambari, et al., (2018); Eden, et al., (2023) and Lawal (2023) that students taught with innovative teaching strategies such as virtual field trip perform better than those taught with conventional field trip method. Instructional strategies when properly used, engender interest and creativity in the students and hence their performance.

With respect to the effect of Instructional strategies used on the performances of the students on the concept of air pollution when taught using VFT and FE based on gender the findings from Table 2 and Table 4 showed that there was no statistically significant effect. The observed posttest - pretest mean difference of the students in each of the treatment groups in Table 2 showed that the male students taught using VFT had the best performance followed by their female counterparts in the same treatment group. In the FE group, female students had better performance than their male counterparts. The overall performance showed female superiority over the males. This finding agreed with Akanwa, et al., (2018); Gambari, et al (2018) and Umoetuk and Akpan (2023) that female students performed better than their male counterparts significantly.

Conclusion

Based on the findings of the study, it was concluded that using both instructional strategies provided the students with first hand experiences and actively involved them in effective hands-on heads on and hearts-on activities during the teaching-learning process but virtual field trip facilitated their understanding of the subject matter taught better than using only the physical field experience; that gender had no statistically significant influence on the students' performances. This therefore implies that instructional strategies used in instructional delivery are significant determinants of learners' learning outcomes; and that if female students are exposed to the same instructional strategies, will perform excellently well as their male counterparts.

Recommendations

Based on the findings and conclusion drawn, the following recommendations were made:

1. Teachers of Basic Science and Technology should adopt virtual field trip in teaching concepts under environmental pollution at all levels of education instead of depending solely on the use of physical field experience strategy.
2. Curriculum planners should emphasize the use of fieldtrips in the teaching of science and technology.
3. All students should be encouraged to the sciences irrespective of their gender.
4. Government and schools should sponsor their science teachers to conferences, workshops and seminar organized to acquaint them with the use of modern instructional strategies.

References

Ado, I. B. & Abasi, A. U. (2014). Effect of practical approach on basic 7 mathematics students' interest and performance in fraction in Uyo Akwa Ibom State of Nigeria. *Journal of Education and Practice, 5(28), 77-80.*

Akanwa, U. N, Ndirika, M. C. & Udoh, N. M. (2018). Effects of iigsaw and debriefing teaching techniques on biology students' academic achievement on water holding capacity of soil in Uyo Municipality. *Global Journal of Academic Research*, 2(1), 12-23.

Akpan, A. O (2016). Field experience: a resource for teaching air pollution in Basic Science and Technology. Unpublished Thesis, Department of Science Education, University of Uyo, Uyo

Akpan, A. O. (2016). Environmental sustainability: assessing the impact air pollutants due to gas flaring - Qua Iboe Estuary Case. *World Journal of Environmental Engineering*, 4(1),1-5.

Akpan, A.O. (2022). Infographics as instructional resources for teaching Basic Science and Technology in Junior Secondary Schools in Akwa Ibom State. *Journal of Basic Education in Nigeria,* 8, 197- 218.

Akpan, A. O. & Akpan, I. F. (2017). Facilitation-activity strategy and pre-service teachers' achievement in Basic Science and Technology. *Journal of Research and Development Education,* 7(1), 38 - 47.

Akpan, A. O., Akpan, I. F. & Umoh, E. B. (2023). Science teachers' awareness and competences needed in utilization of 21st Century skills in teaching in Akwa Ibom State. *International Journal of Educational Research & Human Development,* 4(1), 13-31.

Akpan, A. O., Offiong, N. A., & Udosen (2019). Risk of trace metals in airborne particulates around the Qua Iboe Estuary, Nigeria. *Journal of Chemical Society of Nigeria*, 44(1), 022-029

Akpan, A. O. & Udo, H. I. (2016). Challenges of air pollution on human health in Nigeria. *Nigeria Journal of Health Promotion, 9, 11 – 18.*

Akpan, A. O, Udoden, E. D., & Offiong, N.A.O. (2018). Rainwater chemistry within the vicinity of Qua Iboe Estuary, Nigeria. *CLEAN Soil, Air, Water,* 46(3), 1700114 (1-7).

Danjuma, S. & Andrew, T. (2024). Effect of field trip and inquiry-based instructions on performance among secondary school biology students in Lere Education Zone, Kaduna, Nigeria. *Journal of Science, Technology and Education,* 12(2), 363-394.

Eden, M. I. Akpn, I. F., Umanah, F. I. (2023). Virtual laboratory and hands-on activity approaches on students' academic performance in soap production in Akwa Ibom State, Nigeria. *International Journal of Educational Framework, University of Uyo,* 3(1), 135-150.

Egwu, S. O & Okigbo, E. C. (2021). Effect of field trip on secondary school students' academic achievement in ecology in Anambra State. *South Eastern Journal of Research and Sustainable Development,* 4(1), 140-156.

Etiubon, R. U., Akpan, A. O. & Udoh, N.M. (2021). Enhancing retention of water pollution using tutorial and drill practice among first year science education students of university of Uyo, Nigeria. *European Modern Studies Journal,* 5(3), 139-152.

Federal Ministry of Education (2009). *Minimum standards for Nigeria certificate in education, science and mathematics (4thedition).* National Commission for Colleges of Education Federal Republic of Nigeria (2012). *9-year basic education curriculum. Basic Science and technology (JSS 1-3),* NERDC Printing Press.

Federal Republic of Nigeria (2013). *National Policy on Education.* Nigerian Educational Research and Development Council (NERDC) Press.

Gambari, A. I., Kawu, H., Oluwole, C. F. (2018). Impact of virtual laboratory on the achievement of secondary school chemistry students in homogenous and heterogenous collaborative environment. *Contemporary Educational Technology, 9(3, 246-263*.

George, I. G. & Abasi, A. U. (2025). Effect of origami-based instructional approaches on junior secondary school students' achievement in Geometry. *Global Journal of Academic Research Forum,* 13(1), 70-82.

Hope, A. N., Anari, M. I., Agube, C. C. & Udonkang, W. (2024). Effect of virtual field trip instructional strategy on students' academic achievement and interest in chemistry in Ikono LGA, Akwa Ibom State, Nigeria. *Global Journal of Educational Research,* 23, 427-438.

Itighise, A. E. & Umanah, F. I. (2019). Flipped classroom instructional model and academic performance of science education students in Akwa Ibom State. *Journal of Educational of Educational Media and Technology, 24(2), 1-16.*

Lawal, A. B. (223). Comparative effect of Virtual field trip and traditional field trip on academic performance and motivation of students in conservation concepts of biology in Northwest, Nigeria. *African Multidisciplinary Journal of Development,* 12(1), 1-10.

Mbonu-Adigwe, B. U., Nwagbo, C. R. & Okonkwo, I. O. (2024). Exploring the impact of concept mapping and non-concept mapping instructional strategies on academic achievement of Nigerian students in Basic Science. *African Journal of Science, Technology, Mathematics and Education,* 10(1), 21-26.

Njoku, M. I. A, & Mbogomo, T. (2021). Effect of field trip and demonstration methods on the achievement of secondary school students in biology. *Rivers State Journal of Education,* 24(2), 55-64.

Obadiora, A. J. (2016). Comparative effectiveness of virtual field trip and real field trip on students' academic performance in Social Studies in Osun State secondary schools. *Mediterranean Journal of Social Sciences,* 7(1), 467-474.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202539

Ogunyemi, T. C. & Bamidele, E.O. (2019). Gender influence on students' perception in learning chemistry using multiple representations in learning chemistry in Nigerian secondary schools. *Asian Journal of Education and Social Studies*, 5(1): 1-7.

Olatunde- Aiyedun, T. G. (2021). Interaction effect of animation teaching strategy on students' achievement in climate change. *Journal of Ethics and Diversity in International Communication, 1(6), 1 – 15.*

Oyakhirome, A. H. & Akpan, A. O. (2024). Effect of experimentation on chemistry students' conceptualization of acids, bases and salts. *Interdisciplinary Journal of Science Education* 5(2), 15-23.

Oyediran, B. A. (2023). Field trip teaching strategy and learning outcomes of students in social studies in secondary schools in Osun State, Nigeria, *Educational, Institute of Education, Adekunle Ajasin University,* 12(1), 1-12.

Ukpai, I. B. & Fomsi, E. F. (2023). Animation and infographics instructional strategies on the engagement, performance and retention of secondary school Biology students in Rivers State. *International Journal of Innovative Social & Science Education Research*,11(4), 131-153.

Umanah & Akpan, A. O. (2024). Effects of 5E and 7E learning cycle models on students' academic achievement and retention in chemistry. *Global Journal of Academic Forum,* 12(1), 92 – 106.

Umanah, F. I. & Akpan, A. O. (2025). Effect of competency-based and problem-based learning strategies on students' academic performance in acid-base titrations in chemistry. *Global Journal of Academic Research Forum,* 13(1), 56-69.

Umoetuk, E. & Akpan, A.O. (2023). Computer graphics, flipped classroom instructional strategies and students' performance in Basic Science and Technology in Akwa Ibom State. *Inter-Disciplinary Journal of Science Education*, 5(1), 34-41.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202540

Qualitative Study on Access to Sport Participation: A Panacea for Reducing Insecurity in Nigeria

KABIR, Saratu
sksaratukabir@gmail.com
Tel. Number: +2349061664591

UMEAKUKA, O. A.
okey.umeakuka@unn.edu.ng
Tel. Number: +2348082409858

[1]Department of Early Childhood Care and Education, College of Education, Maru, Zamfara State, Nigeria
[2.] Department of Human Kinetics and Health Education, Faculty of Education, University of Nigeria, Nsukka.

Abstract
In recent time across the globe, the world has been experiencing conflicts, dispute, political unrest, civil disobedience and war. The escalation of security threats including banditry, kidnapping and other challenges that is having a profound impact on quality of education, particularly in certain regions in Nigeria. This paper examines the complex security situation affecting the Nigerian education system, with particular focus on North West Nigeria. It explores how access to sports participation and strategies can serve as a mechanism to reduce insecurity, resolve crises, and transform conflicts between families, states, and regions by mobilizing both youth and adults toward common goals in high-risk zones. The paper also concludes that, throughout history, sport has been an integral component of civilized society and represents a symbolic culture that attracts participation from governments, citizens, and athletes alike, as a universal language that resolve conflicts, reducing insecurity and educating people in ways few other activities can. The paper recommends addressing insecurity in Nigeria through social inclusion, strengthening political systems, and introducing sports education as a core subject in the school curriculum. This approach would be particularly valuable in enhancing peace processes for the next generation in the North West Zone, ultimately reflecting positively on access to quality education throughout Nigeria.
Keywords: Insecurity, Access, Quality, Education, Sports.

Introduction
Education forms the foundation of civilization and serves as the primary instrument necessary for achieving national security. Nations, whether developing or developed, invest in education with the expectation of addressing societal needs, particularly insecurity challenges. Education involves the transmission of valuable ideas necessary for individuals to appropriately adjust to their environment (Basson, 2022). It plays a crucial role in equipping citizens with essential knowledge, values, skills, and attitudes to foster a united, resilient, strong, and equitable society, as outlined in the educational goals of the National Policy on Education (FRN, 2022). Education enables people to realize their potential and enhance their quality of life, equipping them to make meaningful contributions to a peaceful, democratic society and improved wellbeing. Quality education represents the key to all forms of development and is central to advancing human capital necessary for sustaining political, social, and economic progress in any nation. It constitutes a critical component and stands as the most powerful mechanism for transforming human development indices. Quality education has proven to be the most effective vehicle for creating change across various facets of human existence and remains crucial for shaping the future. Such education is only feasible when mechanisms are established to determine citizens' needs, provide learning experiences tailored to satisfy identified needs and demands, and implement measures to maintain standards. Issues of quality and standards in Nigeria's government education sectors have been of national concern, particularly regarding infrastructure, instructional materials, learning environments, teacher training, recruitment and professional development, learning outcomes, and support systems to ensure access to equitable and quality education (FRN, 2022). The National Policy on Education further stipulates that quality assurance should be present at all levels of the Nigerian education system.

Access to quality education represents an undeniable right for every society member, formally accepted by all countries and applicable to all according to their national realities, capacities, development levels, policies, priorities, and environmental challenges (United Nations, 2023). Access to education involves integrating all society members into the school system; similarly, equitable access promotes a holistic educational vision. In this context, equity implies that all learners can learn and should have the opportunity to do so without hindrances related to their backgrounds. Access to education means free,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202540

unlimited, unhindered, and unfettered privilege at each educational level to acquire knowledge, skills, and potential necessary to participate and contribute optimally to societal development (Okeke, 2020). The National Challenges Review Report 2022, from the perspective of SDG-4, revealed that fundamental challenges to education relate to "poor quality of education, lack of access, equity and governance, budgetary constraints, poor teaching quality and absenteeism, lack of textbooks and weak management, and external factors such as poverty, destruction caused by natural disasters and insecurity." Security challenges in Nigeria, particularly the Boko Haram insurgency and banditry, have disrupted education in many parts of the country. Numerous schools have been closed, students and teachers abducted, making it extremely difficult for students to access quality education (Arop & Owan, 2022; Idika et al., 2023).

Nigeria generally, and the North West Zone in particular, currently faces significant insecurity issues. Unemployment, poverty, socio-economic challenges, illiteracy, and mineral resource factors continue to create pathways for youth to be lured into illicit activities including banditry. Attacks and abductions of pupils/students by bandits and criminal gangs have become an unfortunate reality that Nigerians face daily, presenting a substantial threat to providing quality education to young citizens in this zone. Access to and participation in sport has long been recognized as a fundamental right in various international conventions. UNESCO (2022) describes sport and physical education as a fundamental right for all. However, until today, the right to play and participate in sports has often been ignored or disrespected. Sport possesses a unique power to attract, mobilize, and inspire. By its very nature, sport promotes participation and inclusion of citizenship. It embodies human values such as respect for opponents, acceptance of binding rules, teamwork, and fairness principles that align with those contained in the United Nations Charter. The United Nations recognizes sports as a powerful tool for advancing social inclusion, equality, peace, health, and development. The important role that sport plays in advancing social progress is also emphasized in the 2030 Agenda for Sustainable Development. Research conducted by UNICEF (2023) evidenced the potential benefits of sports participation, including enhanced learning and academic performance, decreased risk of substance abuse, reduced stress and depression, increased confidence and self-esteem, and decreased insecurity. Sports serve as instruments for mobilizing both youth and adults to achieve common goals in danger zones in Nigeria for security, peace, and development. Sports are active rather than passive endeavors, involving direct participation.

Sports participation represents a global phenomenon and an integral component of society with substantial economic impacts. Recent studies demonstrate that more than 85.7 million people worldwide participate in some form of sports daily, with approximately 28 percent of these individuals coming from developing nations such as Nigeria (WHO, 2023). Engaging in sports activities is both interesting and entertaining for individuals. The number of people participating in sporting activities increases daily, emphasizing that sporting activities will continue to maintain continuity at the individual level, transferring from one generation to another (Yerima et al., 2023). These illustrations demonstrate that sports participation is vital to human health, quality of life, sound body maintenance, skill acquisition, social and economic development, and reducing insecurity throughout the country.

Nigerian State Insecurity and its Effects on Education

The insecurity situation in the global context represents a major source of concern in both academic circles and the general public. Many schools and physical structures in most learning institutions have suffered violent attacks from insurgency with substantial loss of lives and destruction of property. Most African countries, whose experience has been compounded by colonial legacies of national states with artificial boundaries cutting across many divisions, have experienced insecurity with significant national discomfort, continuing to manifest in forms of corruption and poverty. Education in Nigeria has recently come under significant threat due to increasing mass kidnappings of students from schools. This represents a new strategy adopted by terrorist and bandit groups. School kidnappings have become a major disincentive for both parents and students, leading many to opt against enrolling in schools to ensure their safety. Today, Nigeria has one of the world's highest numbers of out-of-school children with about 13.2 million according to the United Nations Children's Fund (UNICEF, 2023). A wave of school kidnappings has worsened the situation, with some state governments closing boarding schools until security can be guaranteed. Between December 2020 and June 2022, over 1,500 students and staff were kidnapped in 12 school abductions reported in the North West Zone (Musa, 2022). Insecurity signifies a state of being unsafe, fearful, terrorized, or threatened. Security, in simple terms, means the protection of lives and property from destruction (Adams et al., 2022). Umeifekwem (2021) defines insecurity as a state of fear or anxiety stemming from concrete or alleged lack of protection. It represents a lack of inadequate freedom from danger. This reflects physical insecurity, the most visible form, which feeds into many other forms

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202540

such as economic and social insecurity. Ogunode et al. (2023) explain that insecurity in schools constitutes a direct threat to learning. The authors further assert that the prevailing peace or conflict within communities surrounding schools often has ripple effects on the teaching and learning activities of such schools. Insecurity has worsened already, low levels of access to quality education in Zamfara State. According to a 2022 assessment of this sector, 38 percent of those surveyed had no nearby latrines, 58 percent used pit latrines, and 42 percent practiced open defecation. Children do not attend schools due to lack of money, destruction of classrooms, safety fears, lack of teachers who have fled violence, and the need to earn incomes: 33 percent of children aged 5-17 had completely dropped out of school, and a further 29 percent had never attended school. Some families have withdrawn children from Islamiyya schools for these reasons. Some almajirai have been recalled by families due to safety concerns, while others continue as families cannot provide for them if they return (Zamfara Conflict Analysis, 2022). Okobia (2023) reports that Nigeria currently faces a severe insecurity crisis with regionalized patterns. In the southern region, militia groups cause disturbances, while kidnapping rates remain alarmingly high in the east and south, and ritual killings prevail in both the east and west. The northern region suffers from insurgency, and assassinations occur throughout the entire country. Considering the overall situation, it is evident that Nigeria can no longer be considered safe. Many individuals begin journeys but fail to reach their destinations, not due to accidents or natural causes, but because they fall victim to kidnapping. People are abducted from their homes or workplaces for ransom, subjected to torture, and tragically, some are shot dead. No safe haven exists in Nigeria, whether in urban or rural areas.

The effects of insecurity on the educational system are enormous, as reported by Hamidu and Audu (2022). Educational institutions often suffer the worst impacts. For instance, the incessant attacks by Boko Haram insurgents in North-eastern Nigeria have led to the closure of many schools in that region. Casualties of these attacks frequently include teachers, other school staff, and students; students and staff are also often kidnap victims. These circumstances result in low pupil/student enrolment because of displaced families and the children themselves. Additionally, these situations cause psychological trauma and health-related challenges, as many students/pupils in attacked areas experience anxiety, uncertainty, apprehension, sleepless nights, and sometimes displacement to refugee camps. Teachers often retire or relocate to areas less prone to attacks. The insecurity challenge has led to the killing of at least 280 teachers and students across Northern Nigeria, with many schools closed or abandoned. This menace has resulted in school closures, parents withdrawing children from school, student transfers, teacher transfers, decreased student enrolment, increased numbers of out-of-school children, poor student performance, and fear among teachers and students, among other consequences (United Nations Children's Emergency Fund, 2023). In this paper, insecurity is conceptualized as a situation where human and national security of a state is compromised by internal or external forces or interests, exacerbated by weak or poor economic, military, and human resource development conditions. This study presents the necessary conditions to assess the significance of sport in a multi-ethnic nation like Nigeria facing ethno-communal tensions, terrorism, banditry, killings, kidnappings, and various crises. Nations worldwide have used sports to strengthen national goals such as integration. Even in obvious circumstances of disintegration, sports have offered the restoration that nations required for reconstruction, particularly in contexts of insecurity. The United Nations (2021) resolution adopted for crisis regions stated that sports should be used as a means to promote education, health, peace, and development.

Access to Sports Participation and Strategies in Reducing Insecurity in Nigeria

Sports help the tendency to broaden, spread, diversify and helps to assume a greater role in the general security system of any Nation if properly maximized mostly in Nigeria to reduce idleness, tension and anxiety caused by banditry, killing, kidnapping and insurgency in Northern regions. Political leaders, governments, and heads of numerous national agencies have identified the universal value of sports in resolving problems of nations, states, and the world. Kofi Annan, former Secretary-General of the United Nations, stated his belief that:

> "Sports can play a significant role in improving the lives of not only individuals but entire communities. It is the right time to build on this understanding by encouraging governments, development agencies, and communities to consider how sports can be more systematically included in plans to help children and youth, particularly those living amid poverty, disease, and conflict."

This aligns with the United Nations (2021) General Assembly resolution underlining the importance of sports as a means to encourage, enhance, and promote peace, dialogue, and understanding among peoples and civilizations. The UN resolution adopted for crisis regions states that sports should be used to promote quality education, health, peace, development, and

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202540

security. Sports development in Nigeria today, has led to the promotion and involvement of youth in active sporting activities and this make the youth to be more responsible and put their minds off violence. Well-designed sport programs that educate, support and empower youth can encourage positive behaviour change by enhancing self-perception, imparting self-esteem, and promoting more conscious care and respect among youths to curb substance abuse, kidnapping, killings, and any act of hooliganism. Sport is used to reach those most in need, including refugees, child soldiers, and victims of conflict and natural catastrophes. Sports are more than running, jumping, kicking a ball, or hitting an object. They extend beyond play, fun, and recreation, beyond competing for medals or laurels. Sports represent an aspect of education that addresses the whole body and helps build a nation. A nation intending to grow and remain viable must involve its citizens in sports literacy. The intervention of sports in reducing insecurity and resolving conflicts provides meaningful life experiences at an early stage for young people who might otherwise be used in criminal acts, thereby reducing the risk of their involvement in antisocial behavior. Sport has become the most popular form of physical activity for children and youth today (Ahmad, 2022).

According to President Obasanjo (1999) in a goodwill message at the 8th All Africa Games, sport serves as a unifying factor that binds diverse people together as one. At a time when the continent faces numerous challenges in the new millennium and is threatened by war, hunger, and disease, sports continue to present a unique opportunity to foster coexistence, good neighborliness, understanding, and friendship among diverse peoples and cultures. Sport can unite people and create mutual understanding regardless of nationality, ethnicity, gender, culture, or religion. The International Development Agency (2022) reports that by teaching basic social values such as tolerance, teamwork, fairness, and constructive conflict management, sport contributes to a culture based on peaceful values and thus reinforces civil structures. Clearly, sport possesses a significant ability to connect individuals and groups in the peace-building process and transcend segregation and misconception. Moreover, sport allows people to learn important social skills such as conflict management. In the peace-building and insecurity eradication process, sport can function as a healing instrument for traumatized victims of natural disasters or ex-combatants in post-conflict situations.

Conclusion

No nation thrives in an atmosphere of insecurity. Access to quality education and sports reduces inequality, exclusivity, and the negative consequences associated with social deprivation, school failure, and dropouts. The fact that addressing school failure helps overcome the effects of social deprivation, which often causes school failure, indicates that these two dimensions are closely intertwined. Sports constitute a component of human and social development that contributes to social cohesion, tolerance, and integration, forming an effective channel for reducing insecurity. As a universal language, sports represent a powerful medium for social and economic change, capable of bridging cultural gaps, resolving conflicts, reducing insecurity, and educating people in ways few other activities can. Therefore, in critical or difficult political situations, governance effectiveness depends on the ability to address contemporary challenges. Connected to this, sport has been an element of civilized society throughout history a symbolic culture attracting participation from governments, citizens, and athletes alike.

Recommendations

1. The Nigerian government, through its military and paramilitary forces, must make deliberate efforts with international community assistance to eradicate the insecurity menace that has continuously hindered educational programs in Nigeria's Northern region.
2. Government attention to sports will yield benefits as citizens maintain faith and hope in national leadership under stringent economic, educational, and political conditions. This will enable every citizen to pursue common goals and objectives, working toward unity, peace, and reduced insecurity throughout the country.
3. International non-governmental organizations (INGOs) and other NGOs should implement programs connecting sports, peace, and security, using sports to help curb insecurity by bringing people closer together and keeping traumatized youth engaged in non-sport-based education.
4. States should include sports and physical activities in their development policies and promote initiatives to increase participation and access to sports, emphasizing young people particularly. Sports programs must be explicitly designed to develop core skills and values learnable through sports.
5. State and Federal governments should prioritize sports as tools for development and peace, considering the economic, social, cultural, educational, political, and environmental dimensions.
6. Crisis regions, particularly in the North West, should introduce sports education as a subject in the primary school curriculum, providing a valuable tool to enhance peace processes for the next generation.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202540

7. Sports should be implemented equitably and in culturally relevant ways. Sports programs must follow the "sports for all" model, ensuring that all groups have participation opportunities, particularly those who gain additional benefits, such as women, persons with disabilities, and young people.

Acknowledgments

The authors wish to express their sincere gratitude to all individuals and members of The Faculty of Education, Federal University Gusau, that contributed to the successful completion of this work. Special thanks go to the participants who shared their experiences and insights, which formed the foundation of this paper. We are deeply indebted to the faculty and staff of the Federal University Gusau, and other supporting academic institutions for their academic guidance and encouragement throughout this study. Finally, we acknowledge the support of our families, colleagues, and the broader research community for their moral support, constructive feedback, and unwavering belief in the potential of sports as a tool for national transformation and peacebuilding.

References

Adams, O.T., Adedeji, M.S., Majekodun, O.A., Kehinde, B.R., & Adams, T.A. (2022). *The Effects of Insecurity on School Systems (Secondary Schools) in Nigeria*. Journal of Educational Security and Development, 14(2), 126-136.

Ahmad, K. (2022). *Psychosocial Roles of Sports in Peacebuilding: A Study of In-school Adolescents in the Niger-Delta*. International Journal of Sport Psychology and Education, 18(3), 245-259.

Arop, F.O., & Owan, V.J. (2022). *Institutional variables and security supervision in Nigerian public secondary schools: An updated analysis*. Educational Management Administration & Leadership, 50(4), 722-738.

Basson, R. (2022). *Contemporary Perspectives on Education and Social Development*. Journal of Educational Research and Policy, 17(2), 37-48.

Federal Republic of Nigeria (2022). *National Policy on Education (7th edition)*. Lagos: NERDC Press.

Hamidu, I., & Audu, B. (2022). *Educational Security Challenges in Northern Nigeria: Current Dynamics and Solutions*. In Educational Development in Conflict Zones (pp. 178-195). Ibadan: University Press.

Idika, D.O., Orji, E.I., Bichene, C.E., & Oke, T.O. (2023). *Digital solutions for educational continuity in insecure regions: A mixed-method study*. Education and Information Technologies, 28(3), 3344-3365.

International Development Agency. (2022). *Sport for Development and Peace: Building Social Cohesion in Conflict Zones*. Geneva: IDA Publications.

Musa, M.Y.E. (2022). *Trends in Educational Security Challenges: Analysis of School Kidnappings in North-West Nigeria*. Journal of Security Studies, 15(4), 412-428.

Ogunode, N.J., Ohaeri, N.C., & Musa, A. (2023). *Strategic responses to insecurity in educational institutions: Administrative perspectives*. International Journal of Educational Administration, 11(2), 189-204.

Okeke, R.C. (2020). *Equitable access to education: Re-examining policy frameworks in developing nations*. Comparative Education Review, 64(3), 418-440.

Okobia, F.N. (2023). *Security-education nexus: Empirical evidence from Nigeria's conflict zones*. Journal of Peace Research, 60(2), 217-232.

UNICEF. (2023). *Education Under Threat: The Impact of Insecurity on Children's Learning in Northern Nigeria*. Abuja: UNICEF Nigeria.

United Nations. (2021). *Sport as a catalyst for peace and development: Resolution 75/18*. New York: United Nations.

United Nations. (2023). *Progress toward Sustainable Development Goal 4: Education 2030 Framework for Action*. New York: United Nations.

UNESCO. (2022). *International Charter of Physical Education, Physical Activity and Sport (Revised)*. Paris: UNESCO Publishing.

Umeifekwem, U. (2021). *Security provisioning in Nigeria: Theoretical perspectives and practical challenges*. African Security Review, 30(1), 78-94.

WHO. (2023). *Global status report on physical activity and sports participation*. Geneva: World Health Organization.

Yerima, H.M., Johnson, L.K., Ahmed, S.B., & Peters, T.O. (2023). *Sports participation patterns in developing nations: Evidence from West Africa*. International Journal of Sport Policy and Politics, 15(1), 92-108.

Zamfara Conflict Analysis and Multi-Sectoral Needs Assessment. (2022). *Education in Crisis: Impact Assessment of Banditry on Schooling in North-West Nigeria*. Abuja: Search for Common Ground.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202541

Correlation Between Perception and Satisfaction of ChatGPT Applications in Biology Learning among Undergraduate Students in Federal University of Education, Zaria

SALISU, Mushiri
Email: mmushry@gmail.com
Phone number: 07036459048

ALAFIATAYO, Bunmi Mercy
Email: bumercyalafiatayo@gmail.com
Phone number: 08154458610

[1]Department of Science Education, Ahmadu Bello University, Zaria.
[2]Biology Department, Federal University of Education, Zaria.

Abstract
This study investigated the Correlation between Perception and Satisfaction of ChatGPT applications in Biology learning among undergraduate students in Federal University of Education, Zaria. To achieve the aim of the research work, three objectives were identified, which led to the formulation of three research questions and two research hypotheses respectively as a guide to the study. The population of the study comprised of 631 undergraduate Biology students during the academic session of 2024/2025 in Federal University of Education, Zaria, and 150 Students were randomly selected. Perception of students in the use of ChatGPT Questionnaire and Students Satisfaction on ChatGPT Questionnaire was used as instruments for data collection. The instruments were subjected to validation by experts and have validity score of 0.68 and 0.71 respectively. 100% of the questionnaires were properly filled and returned. The data collected were summarized and analyzed using simple percentage, mean and standard deviation while regression analysis was used to test the hypothesis at 0.05 level of significance, The result revealed that, undergraduate Biology students find ChatGPT relatively easy to use, indicating its potential as an accessible and effective educational tool. It was recommended among others that, Educators should create and disseminate resources that maximize ChatGPT's potential in Biology education, such as interactive simulations, virtual labs, and adaptive assessments.
Keywords: ChatGPT, Perceived Usefulness, Ease of use, and Undergraduate Biology Students.

Introduction
The past decade has witnessed a transformative shift in educational practices, driven primarily by technological innovations. Artificial intelligence (AI) has emerged as a game-changer, revolutionizing the learning landscape. However, its integration into education has sparked intense debates (Lohitha and Sumathi, 2024). They further argue that AI-powered tools like ChatGPT herald a new era in education and research, enhancing efficiency, personalization, and global accessibility. On the other hand, Bello et al. (2024) express concerns that over-reliance on AI may compromise analytical skills, potentially leading to educational complacency among teachers and students. In November 2022, OpenAI introduced ChatGPT, a generative pre-trained transformer, which swiftly garnered significant attention due to its advanced language capabilities (Neumann et al., 2022). Notably, ChatGPT attracted one million registered users within its first week of public availability (Haque et al., 2022). Its perceived usefulness has led to widespread adoption across various sectors, including higher education, K-12 education, and skill development. In the context of information and communication technology (ICT), perceived usefulness encompasses the recognition of digital technology's potential to streamline tasks and address challenges (Scherer & Hatlevik, 2017). Self-efficacy is an individual's belief in their ability to succeed in specific situations or accomplish a task. Empirical evidence indicates that self-efficacy plays a pivotal role in shaping technology acceptance, primarily through its influence on perceived usefulness (Al-Rahmi et al., 2020; Elif et al., 2024). Additionally, research highlights the significant relationship between self-efficacy and perceived usefulness in technology adoption (Al-Rahmi et al., 2020). Attitude refers to a person's feelings, beliefs, and behaviors towards a particular object, person, group, or idea. It is a complex mental state that influences an individual's thoughts, emotions, and action. According to the Technology Acceptance model (TAM), a person's attitude shaped by two beliefs: their perception of how useful something is, and their perception of how easy it is to use (Bello et al., 2024 and Haque, 2023) As for self-efficacy, it is one of the external factors of the TAM (Kulviwat et al., 2014). Despite these reservations the impact of AI in education is undeniable. Key benefits include streamlined educational processes, enhanced global learning opportunities, personalized learning experiences, intelligent content creation, and optimized educational management. As AI

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202541

continues to reshape the educational landscape, it is crucial to address concerns and harness its potential to foster effective, engaging, and inclusive learning environments. The impact of ChatGPT on productivity, efficiency, and ethical concerns has become a prominent topic of discussion on social media platforms (Mogavi et al., 2023). Given its rapid proliferation and popularity, particularly in higher education (Das and Madhusudan, 2024). Limited research exists on the perceived usefulness and ease of use of ChatGPT among Biology students, hindering educators' understanding of its potential benefits and drawbacks. On this background, this paper seek to investigate the correlation between perception and satisfaction of ChatGPT applications in Biology learning among undergraduate students in Federal University of Education, Zaria.

Aim and Objectives

This study aims to analyze the perception of students in the use of ChatGPT among undergraduate Biology students in Nigeria. In specific terms, the objectives of this study are to:

1. Assess the level of awareness and usage of ChatGPT among undergraduate Biology students.
2. Examine the perception of use of ChatGPT among undergraduate Biology students in enhancing learning outcomes.
3. Determine the ease of use of ChatGPT among undergraduate Biology students.

Research Questions

In order to operationalize and achieve these research objectives, we raised and addressed the following research questions:

1. What is the level of awareness and usage of ChatGPT among undergraduate Biology students?
2. How useful do undergraduate Biology students perceive ChatGPT in enhancing their learning outcomes?
3. How easy or difficult do undergraduate Biology students find ChatGPT to use?

Research Hypotheses

Ho_1: There is no significant relationship between the level of awareness and usage of ChatGPT among undergraduate Biology students of F.U.E, Zaria.

Ho_2: There is no significant relationship between perceived ease of use and students' satisfaction with ChatGPT**.**

Methodology

Descriptive Survey design was adopted in this research. The population comprised all undergraduate Biology education students of the Federal University of Education, Zaria. The participants of this study were undergraduate Biology education students of the Federal University of Education, Zaria, from 100 level to 400 level. Simply random sampling was used to select 150 sample size out of the population, the distribution of the students are displayed in table 1.

Table 1: Population of the Study

Level	Male	Female	Total	Sample Size
100 level	5	15	20	5
200 level	52	73	125	40
300 level	83	187	270	55
400 level	79	137	216	50
Total	**219**	**412**	**631**	**150**

Source: Biology department, FUE, Zaria, 2025

The instruments for data collection was a structured Questionnaires developed by the researchers titled "Perception of students in the use of ChatGPT Questionnaire and Students Satisfaction on ChatGPT Questionnaire" The instruments has three dimensions with 15 and 13 questions respectively. It was designed into four (4) points Likert-Scale of Strongly Agreed (SA), Agreed (A), Disagreed (D), and Strongly Disagreed (SD), and the research question one was designed into Very likely, Likely, somewhat likely and Not at all likely scale. The instruments were validated by an expert from Federal University of Education, Zaria, and have the validity score of 0.68 and 0.71 respectively.

Data Collection

The researchers develop a Google form of the questionnaires and send it to the students through their class WhassApp groups and give them the timeline of four weeks to complete submitting their responses thereby ensuring the 100 percent of responses.

Data Analysis

The data collected from the Questionnaire were summarized using frequency, percentage, Mean and standard deviation to answer the research questions while Regression analysis was used to analyze the research hypotheses at a 0.05 level of significance

Presentation of Result

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202541

Research Question One: What is the level of awareness and usage of ChatGPT among undergraduate biology students?

Table 2: Showing the frequency and percentage of the responses on the level of awareness and usage of ChatGPT among undergraduate biology student

S/N	ITEMS	Responses	Percentage
1.	Very likely	**104**	**69.3%**
2.	Likely	**42**	**28%**
3.	Somewhat likely	**4**	**2.2%**
4.	Not at all likely	**1**	**0.5%**
	TOTAL	**150**	**100%**

Source: Field Survey, 2025.

Table 2. Shows the level of awareness and usage of ChatGPT among undergraduate Biology students of FUE, Zaria. 99.5% of the students are aware of ChatGPT and also 97.3% are using it frequently, 2.2% are not using it frequently, only 0.5% of the students are not using ChatGPT among undergraduate Biology students of FUE, Zaria.

Table 3: Showing the frequency and percentage of the responses on how likely the student are to recommend ChatGPT to their peers

S/N	ITEMS		Responses	Percentage
1.	Very likely		**80**	**53.3%**
2.	Likely		**62**	**41.3%**
3.	Somewhat likely		**7**	**5%**
4.	Not at all likely	**1**	**0.4%**	**4.**
	TOTAL	**150**	**100%**	

Source: Field Survey, 2025.

Table 3. Shows how undergraduate Biology students of FUE, Zaria are willing to recommend ChatGPT to their peers. 94.6% of the students are very likely and likely to recommend ChatGPT to their peers, 5% are somewhat likely to recommend, while 0.4% chooses not at all likely, means they are not willing to recommend ChatGPT to their colleagues at Biology department FUE, Zaria.

Research Question One: How useful do undergraduate Biology students perceive ChatGPT in enhancing their learning outcomes?

Table 4: Showing the Mean and Standard deviation of the responses on how useful do undergraduate Biology students perceive ChatGPT in enhancing their learning outcomes

S/N	ITEMS	X	SD	DECISION
1.	Using ChatGPT helps me better understand complex Biology concepts.	3.73	0.44	Agreed
2.	ChatGPT is useful for generating ideas for Biology assignments.	3.58	0.50	Agreed
3.	ChatGPT enhances my ability to analyze biological data.	3.49	0.59	Agreed
4.	I find ChatGPT helpful in preparing for Biology exams.	3.58	0.52	Agreed
5.	ChatGPT improves my overall learning experience in Biology.	3.65	0.47	Agreed
	AVERAGE MEAN	**3.60**	**0.50**	
	DECISION MEAN 2.50			

Source: Field Survey, 2025.

Table 4. Shows the result of how useful do undergraduate Biology students perceive ChatGPT in enhancing their learning outcomes. The respondents agreed that, using ChatGPT helps them to better understand complex Biology concepts (Mean=3.73; SD=0.44). They also agreed that ChatGPT is useful for generating ideas for Biology assignments (Mean=3.58; SD=0.50). And also they found that ChatGPT enhances their ability to analyze biological data (Mean=3.49; SD=0.60). Additionally, they found that ChatGPT helpful in preparing for Biology exams (Mean=3.58; SD=0.52). And lastly, they found that ChatGPT improves their overall learning experience in Biology (Mean=3.65; SD=0.47). The overall mean and standard deviation of perception of use of ChatGPT among undergraduate Biology students was 3.60 and 0.50 respectively, showing a

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202541

general perception of ChatGPT usefulness. The result also indicated that the overall mean scores of all items is above the decision mean of 2.50.

Research Question Three: How easy or difficult do undergraduate Biology students find ChatGPT to use?

Table 5: Showing the Mean and Standard deviation of the responses on how easy or difficult do undergraduate Biology students find ChatGPT to use

S/N	ITEMS	X	SD	DECISION
1.	I find it easy to navigate and use ChatGPT's features.	3.67	0.45	Agreed
2.	ChatGPT's interface is user-friendly.	3.65	0.47	Agreed
3.	I easily understand how to use ChatGPT for Biology-related tasks.	3.59	0.44	Agreed
4.	I encounter few difficulties when using ChatGPT.	1.94	0.85	Disagree
5.	ChatGPT's functionality is intuitive.	3.63	0.50	Agreed
	AVERAGE MEAN	**3.30**	**0.54**	
	DECISION MEAN 2.50			

Source: Field Survey, 2025.

Table 5. Shows how easy undergraduate Biology students found ChatGPT to use. The students found it easy to navigate and use ChatGPT's features (Mean=3.67; SD=0.45). They affirm that, ChatGPT's interface is user-friendly (Mean=3.65 SD=0.47). And also they consider it very easily understand how to use ChatGPT for Biology-related tasks (Mean=3.59; SD=0.44). Hence, the responders disagreed with the statement that they encounter few difficulties when using ChatGP (Mean=1.94; SD=0.85). They believed that, ChatGPT's functionality is intuitive (Mean=3.63; SD=0.50). The overall mean scores and standard deviation of perceived ease of use of ChatGPT among undergraduate Biology students of FUE, Zaria, were 3.30 and 0.54 respectively, showing a general perception of ChatGPT ease of use. It revealed that the students find it very easy to use ChatGPT, and they don't encounter difficulties when using it. The result also indicated that the overall mean scores of all items are above the decision mean of 2.50.

Tests of Hypothesis

Ho_1: There is no significant relationship between the level of awareness and usage of ChatGPT among undergraduate Biology students of F.U.E, Zaria

Table 5: Regression Analysis summary of the test of the relationship between level of awareness and usage of ChatGPT among undergraduate Biology students of F.U.E, Zaria.

Variables	Coefficient	t-value	Standard error	R2	F-statisticd	P-value	Decision
Level of awareness	2.083	8.503	0.245				
				0.693	63.151	0.001	Rejected
Usage of ChatGPT	0.421	7.943	0.421				

Source: Field Survey, 2025.

The coefficient for usage of ChatGPT is 0.421, a positive relationship between level of awareness and usage of ChatGPT among undergraduate Biology students of FUE, Zaria. This means that for every unit increase in level of awareness, usage of ChatGPT increases by 2.083 units. The p-value is 0.001, which is less than the significance level of 0.05, indicating a significant relationship. The R-squared value is 0.693, indicating that 69.3% of the variance in usage of ChatGPT can be explained by level of awareness. The F-statistic is 63.151, and the p-value is 0.001, indicating that the overall model is statistically significant. Based on the results, the null hypothesis was rejected.

Ho_2: There is no significant relationship between perceived ease of use and students' satisfaction with ChatGPT

Table 6: Regression Analysis summary of the test of the relationship between perceived ease of use and students' satisfaction with ChatGPT.

Variables	Coefficient	t-value	Standard Error	R2	F-Statistics	p-value	Decision

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202541

Perceived ease of use	0.653	9.191	0.071				
				0.734	84.227	0.001	Rejected
Students' satisfaction	1.503	6.503	0.231				

Source: Field Survey, 2025.

The regression analysis reveals a significant positive relationship between perceived ease of use and students' satisfaction ($p < 0.001$). This means that for every unit increase in perceived ease of use, students' satisfaction increases by approximately 0.653 units. The p-value is 0.001, which is less than the significance level of 0.05, indicating a significant relationship. The R-squared value is 0.734, indicating 73.4% of the variance in students' satisfaction can be explained be perceived ease of use of ChatGPT. The F-statistic is 84.227. Based on the result, the null hypothesis was rejected

Discussion of Findings

The result of research question one indicates a high level of awareness and usage of ChatGPT among undergraduate Biology students with, frequency of use of 94.7% of respondents use ChatGPT for Biology-related tasks, 69.3% , and 94.7% of respondents are likely to recommend ChatGPT to peers, with 53.3% highly likely. Higher education students are leveraging ChatGPT for various academic purposes, such as; Seeking assistance with homework and writing tasks, solving complex problems and analyzing data, preparing for tests and exams, clarifying conceptual understanding, supporting research endeavors, accessing supplementary learning materials (Hasanein & Sobaih, 2023; Phuong et al., 2023; Sulisworo and Dahlan, 2023; Das and Madhusudan, 2024). Bello et al., 2025 in their study, explained that when awareness is high, regular usage is limited, possibly due to some barriers such as lack of training or anxiety about the privacy and reliability of AI-generated content. The findings of research question two confirmed that ChatGPT has a significant impact on undergraduate Biology students' learning experiences. Specifically, Conceptual understanding ChatGPT, aids in clarifying complex Biology concepts with the (Mean 3.73); Idea Generation, ChatGPT facilitates idea generation for Biology assignments (Mean 3.58); Data Analysis, ChatGPT enhances biological data analysis skills (Mean 3.49); Exam Preparation, ChatGPT supports Biology exam preparation (Mean 3.58); Overall Learning Experience, ChatGPT improves the overall Biology learning experience (Mean 3.65). The high mean scores across all items (range: 3.49-3.73) demonstrate a strong positive perception. The results unequivocally indicate that undergraduate Biology students perceive ChatGPT as an extremely useful tool in enhancing their learning outcomes (Lohitha and Sumathi, 2024; Bello et all., 2024; Ying, 2023; Bouzar et al., 2024; Pérez et al., 2020). The results of research question three further indicate that undergraduate Biology student's find ChatGPT relatively easy to use, with an overall average mean of 3.30, exceeding the decision mean of 2.50. This suggests a positive perception of ChatGPT's usability. The finding corroborates Strzelecki's (2023) findings, which highlighted ChatGPT's intuitive interface and multilingual functionality as key factors driving user acceptance. ChatGPT's design is largely user-centered (Das and Madhusudan, 2024). Students can quickly adapt to ChatGPT's features (Strzelecki, 2023). Minor usability issues exist, but overall satisfaction is high as observed by many research like Bello et al., 2024; Mogavi, 2023; Clauditte et al., 2023 and Haque, 2023. Overall, the findings suggest that undergraduate Biology students find ChatGPT relatively easy to use, indicating its potential as an accessible and effective educational tool. Research by Clauditte et al. (2023) emphasizes the benefits of combining cutting-edge technologies with experiential learning methods in classrooms. This approach, particularly effective in STEM fields, includes AI interactions, multimedia analyses, and team-based projects that cultivate critical thinking and improve learning abilities.

Conclusion

This study investigated the level of awareness and usage of ChatGPT among undergraduate Biology students. The results revealed a significant positive relationship between the usage of ChatGPT and the level of awareness. The study further investigated the relationship between perceived ease of use and satisfaction with ChatGPT among undergraduate Biology students. The findings revealed a significant positive correlation between the two variables, indicating that ease of use is a critical factor influencing student satisfaction.

Recommendations

Base on the research finding the following recommendations are made:

1. Government, curriculum developers and education stakeholders should incorporate ChatGPT into Biology courses to enhance student learning outcomes. This integration can include developing resources to optimize ChatGPT usage for Biology-related tasks.
2. Educators should create and disseminate resources that maximize ChatGPT's potential in Biology education, such as interactive simulations, virtual labs, and adaptive assessments.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202541

3. Regularly assess student engagement and feedback to improve ChatGPT's effectiveness in Biology education. This can involve tracking usage metrics, conducting surveys, and gathering feedback from students and educators

References

Al-Rahmi, W. M., Alzahrani, A. I., Yahaya, N., Alalwan, N., & Kamin, Y. B. (2020). Digital communication: Information and communication technology (ICT) usage for education sustainability. *Sustainability, 12(12), 5052*. https://doi.org/10.3390/su12125052

Bello, S. B., Abdurrahman, M. S., & Bebeji, U. S. (2025). Artificial Intelligence in legal Education: Perceptions of ease of use and usefulness of CHATGPT among undergraduate law Students of Ahmadu Bello University, Zaria. *Journal of the Department of Jurisprudence and Public Law. LexScriptio, 2 (1). 81-94.*

Bello. S. B., Suleiman. Z. A., Abdurrahman. M. S. Bashar. A., & Ibrahim. J. A. (2024). Perceptions of ease of use and usefulness of Artificial Intelligence ChatGPT among Undergraduate law Students of Ahmad Bello University, Zaria. Proceeding of International Conference of Faculty of Law, Ahmadu Bello University, Zaria.

Bouzar. A., El idrissi. K., & Ghourdou. T. (2024). Gender differences in perceptions and usage of ChatGPT. *International Journal of Humanities and Educational Research*. *6(2)*. 2757-5403.

Clauditte. T. T., Lekan. L., Martha. T., Clement. G. Y., & Hong. L. (2023). Leveraging artificial intelligence and interactive learning approaches for enhanced student achievement and perspectives in a biology course. *International Journal of Science Academic Research*. *4 (12).* Pp.6708-6712, accessed. http://www.scienceijsar.com

Das, S.R. Madhusudan. J.V. (2024). Perceptions of higher education students towards ChatGPT usage. *International Journal of Technology in Education* (IJTE), *7(1),* 86-106. https://doi.org/10.46328/ijte.583

Elif. E., Sahin. G., & Kemal. G. K. (2024). Acceptance of Educational Use of AI Chatbots in the Context of Self-Directed Learning with Technology and ICT Self-Efficacy of Undergraduate Students, *International Journal of Human–Computer Interaction*, DOI: 10.1080/10447318.2024.2303557

Haque, M. A. (2023). A Brief Analysis of "ChatGPT"-A Revolutionary Tool Designed by OpenAI. EAI Endorsed Transactions on AI and Robotics, 1. (15). https://doi.org/10.4108/airo.v1i1.2983

Hasanein, A. M., & Sobaih, A. E. E. (2023). Drivers and Consequences of ChatGPT Use in Higher Education : Key Stakeholder Perspectives. *European Journal of Investigating in Health, Psychology. Education, 13, 2599–2614.* https://doi.org/ 10.3390/ejihpe13110181

Lohitha. R., & Sumathi. S. (2024). An Analysis on Impact and Utilisation of ChatGPT among College Students. *Journal of Emerging Technologies and Innovative Research* (JETIR). *11. (4).* www.jetir.org

Mogavi, R. H., Deng, C., Kim, J. J., Zhou, P., Kwon, Y. D., Metwally, A. H. S., Tlili, A., Bassanelli, S., Bucchiarone, A., Gujar, S., Nacke, L. E., and Hui, P. (2023). Exploring User Perspectives on ChatGPT: Applications, Perceptions, and Implications for AI-Integrated Education. arxiv. http://arxiv.org/abs/2305.13114

Neumann, M., Rauschenberger, M., and Schön, E.-M. (2023). "We Need To Talk About ChatGPT": The Future of AI and Higher Education. In 2023 IEEE/ACM 5th International Workshop on Software Engineering Education for the Next Generation (SEENG) (pp. 29-32). Melbourne, Australia. https://doi.org/10.1109/SEENG59157.2023.00010

Phuong, N. T., Tien, C., Thi, K., & Quang, N. (2023). Interaction behaviors of students from thai nguyen university of education with chatgpt. *European Journal of Education Studies, 10(11)*, 39–50. https://doi.org/10.46827/ejes.v10i11.5047

Strzelecki, A. (2023). To use or not to use ChatGPT in higher education? A study of students' acceptance and use of technology. Interactive Learning Environments, May, 1–14. https://doi.org/10.1080/10494820.2023.2209881

Sulisworo, D., & Dahlan, U. A. (2023). Exploring the Usage of ChatGPT in Higher Education : Frequency and Impact on Productivity. *Buletin Edukasi Indonesia (BEI) 2(01),* 39–46.https://doi.org/10.56741/bei.v2i01.310

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202542

Qualitative Study on Integration of Biometric-Based System for Monitoring Students' Lecture Attendance among Higher Institutions in North-Central, Nigeria

OGUNJE, Blessing Fausat[1]
ogunjeblessing@gmail.com
08032245618

TUKURA, Charles Saidu[1]
tukurasaidu@futminna.edu.ng
09131784058

SOBOWALE, Favour Mosunmola[1]
favour.sobowale@futminna.edu.ng.
08039657282

DAVID, Michael[1]
mikeforheaven@futminna.edu.ng
08033469642

[1]Department of Educational Technology, Federal University of Technology, Minna

Abstract
This paper This study investigates integration of Biometric-Based System for monitoring students' lecture attendance among higher institutions in North-Central, Nigeria Information and Communication Technology (ICT) plays a critical role in modern society, revolutionizing various sectors including education. Despite its indispensable nature, traditional attendance methods in Nigerian higher institutions, such as calling names or signing paper registers, are often cumbersome, time-consuming, and prone to issues like signature forgery and inaccurate records, especially in large classes. These inefficiencies contribute to student absenteeism, which has a significant inverse relationship with academic performance. The study BSMSLA aims to address these challenges by automating attendance tracking, enhancing accuracy, promoting student punctuality, and reducing administrative workload for lecturers. This mixed-method study involves developing the BSMSLA package, implementing it in selected institutions, and determining the attitudes and perceptions of both students and lecturers towards its use, as well as its impact on academic performance.
Keywords: Automated Attendance Management System, Information Technology, Nigeria, Performance, Tertiary Institutions

Introduction
Information and Communication Technology (ICT) has profoundly reshaped human activities globally, influencing communication, information access, business, and daily life. Its pervasive impact is evident across various sectors, from social media use for news (69% of U.S. adults) (Pew Research Center, 2021) and widespread internet adoption (over 4.9 billion users worldwide in 2021), to the transformation of e-commerce (USD 4.28 trillion in global sales in 2020) (Statista, 2021). Education, in particular, has been significantly influenced, with online learning becoming crucial during events like the COVID-19 pandemic, affecting over 1.2 billion students globally. Beyond remote learning, ICT, and more specifically Information Technology (IT), plays an indispensable role in enhancing educational standards. IT's role in education includes automating attendance tracking using technologies such as biometric scanners, RFID cards, or mobile apps, thereby eliminating manual processes, reducing errors, and enabling real-time data collection and analysis. This allows institutions to monitor attendance trends, identify chronic absenteeism, and make informed decisions. Integrated IT systems can link attendance data with student information systems, class schedules, and academic records, facilitating a comprehensive view of a student's performance over time. Traditional methods, like roll calls or manual signatures, are time-consuming and inefficient, especially in Nigerian higher institutions with large class sizes. These methods are also susceptible to issues like signature forgery, where absent students are marked present by friends. Such inaccuracies contribute to increased workload for lecturers, who must manually calculate attendance percentages to determine eligibility for final exams. According to Alyahyan and Düştegör (2020), Student absenteeism is a critical issue that adversely impacts academic performance, often viewed as a sign of poor motivation for

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202542

learning. It poses a serious challenge to curriculum implementation and the production of high-level manpower in society. Consequently, there is a pressing need for effective management and maintenance of student information, including attendance, which currently presents a huge workload for lecturers. Biometric technology, a subset of IT, offers a promising solution. It is widely employed across various domains for identification and access control, including industries, airports, ATMs, and jail management (Khan & Efthymiou, 2021). Biometric-based attendance systems use unique physical or behavioural characteristics like fingerprints, face recognition, or iris scans to verify identity, thereby solving problems associated with traditional methods. While biometrics offers convenience and security, student attitudes towards such systems can vary, influenced by factors like privacy concerns, technical reliability, trust in the institution, and peer perceptions. This research aims to address the challenges of attendance monitoring in Nigerian higher institutions by developing and implementing a customized Biometric Attendance Monitoring System (BSMSLA). This system is intended to reduce student absenteeism, eliminate "time theft" (fraudulent attendance), and improve academic performance by ensuring accurate and efficient attendance records.

Literature Review

Concept of Information Technology

Information Technology (IT) is fundamental to modern academic sectors, driving advancements in student monitoring and management systems. IT enables online learning and e-learning platforms, making education more dynamic and accessible anywhere, anytime (Rjeib *et al*., 2018). It also facilitates data analytics for insights into student performance and automates administrative tasks like enrollment and record-keeping, enhancing efficiency. The development of IT has consistently aimed to provide convenience, speed, and streamline work. Managing student information traditionally is cumbersome, prone to errors, and time-consuming. Modern IT solutions, such as smartphone-based applications, offer more efficient ways to store, retrieve, and send student information (Kehtarnavaz *et al.* 2022)..

Attendance Management Systems (AMS)

Attendance capture and recording are crucial for student academic success, as low attendance often leads to underperformance (Ardill, 2024). The increasing number of students necessitates automated attendance systems to replace tedious traditional methods like manual roll calls or paper sheets, which consume valuable class time and are susceptible to errors or loss.

Common methods of attendance tracking include:

i. Manual attendance: Traditional, paper-based, time-consuming, and prone to errors or loss.
ii. Roll call software: Digital platforms used by lecturers for attendance, offering features like student lists and report generation, enabling real-time tracking.

Biometric sheets, which consume valuable class time and are susceptible to errors or loss. Common methods of attendance tracking include:

i. Manual attendance: Traditional, paper-based, time-consuming, and prone to errors or loss.
ii. Roll call software: Digital platforms used by lecturers for attendance, offering features like student lists and report generation, enabling real-time tracking.
iii. Biometric attendance system: Utilizes unique physical (fingerprints, facial features, iris scans) or behavioural characteristics for accurate identification and attendance recording. This method is considered more secure and eliminates proxy attendance.
iv. Radio Frequency Identification (RFID) or smart card systems: Uses ID cards with embedded RFID chips for registration upon swiping or tapping. RFID technology offers advantages like non-contact data reading, reliable data transfer, and low design costs. Combined with fingerprint identification, it can prevent proxy attendance.
v. Mobile apps: Allows students or faculty to mark attendance via smartphones, syncing data with institutional databases.

Automated attendance systems offer several advantages:

i. Accuracy and time efficiency: Reduces errors and saves time compared to manual methods.
ii. Data Analysis: Provides data for identifying attendance patterns, monitoring trends, and assessing impact on academic performance.
iii. Compliance: Helps institutions adhere to attendance policies and identify students with poor attendance.
iv. Communication: Can send automated notifications to parents for unexcused absences.
v. Report Generation: Facilitates creation of attendance reports for administrative, evaluation, or auditing purposes.
vi. Biometric Technology Biometric technology is primarily used for identification and access control. It involves the examination of unique physical characteristics (face, fingerprints, palm, retina, and iris) or behavioural characteristics

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202542

(Alrawili, 2024) (speech, signature, and keystroke dynamics). The human face is considered a highly important biometric feature for various applications like security systems and credit card verification.

Biometric systems are classified as:

i. Unimodal systems: Use a single biometric source (face, iris, and fingerprint).
ii. Multimodal systems: Enhance performance by combining multiple physical characteristics (face and fingerprint), or using multiple sensors, features, or repeated instances of the same biometric. Examples include systems that combine face and fingerprint recognition for continuous learner validation in e-learning or for online examinations.

Impact of Information Technology on Attendance Management System

IT has transformed attendance management, making it more efficient and accurate. Key impacts include:

i. Automation: Replaces manual roll calls with faster, more accurate digital systems.
ii. Real-time data: Lecturers and administrators can instantly access up-to-date attendance records.
iii. Minimized errors: Automated systems reduce discrepancies inherent in manual recording.
iv. Integration: Seamlessly integrates with student information systems for comprehensive data management.
v. Parental communication: Enables instant notifications to parents regarding student attendance.
vi. Reporting and analytics: Facilitates detailed attendance reports and trend analysis for improved attendance rates.
vii. Early intervention: Helps identify consistent absenteeism patterns, allowing timely support for at-risk students.
viii. Transparency and accountability: Maintains a clear audit trail for reporting and compliance.
ix. Accessibility: Cloud-based and mobile apps allow remote access to attendance data.
x. Resource optimization: Streamlines processes, freeing educators to focus on teaching.

Importance of Students Attendance to Lectures in Tertiary Institutions

Lecture attendance is a policy issue in Nigerian tertiary institutions, often requiring a minimum percentage (75-80%) for exam eligibility. This mandates accurate attendance records. However, manual methods hinder strict policy implementation due to time consumption, impersonation risks, and high student populations. Poor attendance directly correlates with poor academic performance (Joy *et al*., 2021). Absenteeism is seen as poor motivation for learning, challenging curriculum implementation. While some strategies like roll calls or surprise quizzes are used, they are often time-consuming and inaccurate. Factors contributing to absenteeism include poor student disposition, societal problems (exam malpractice), health issues, boring teaching methods, peer pressure, poverty, and availability of course materials online (Shete, *et al.*, 2018).

Theoretical Framework

This study is guided by three theoretical models:

Technology Acceptance Model (TAM):

Developed to predict technology acceptance, TAM posits that perceived usefulness and perceived ease of use directly influence a user's willingness to adopt a technology. BioTAM, a specific application, examines factors like user interfaces and biometric procedures in determining user intention for biometric systems. For this study, TAM helps understand student and lecturer attitudes towards BSMSLA.

Unified Theory of Acceptance and Use of Technology (UTAUT):

This framework explains technology acceptance and usage. Applied to biometric attendance systems, UTAUT considers: (i) Performance Expectancy: Belief that the system improves task effectiveness (accurate attendance tracking). (ii) Effort Expectancy: Perceived ease of use, advocating for user-friendly interfaces. (iii) Social Influence: Impact of peers and supervisors' opinions on adoption. (iv) Facilitating Conditions: Availability of training, technical support, and resources.

Perceived Risk: Concerns about privacy, security, and reliability, which must be minimized. (v) Behavioral Intention to Use: Willingness to use the technology. (vi) Actual Use Behavior: Monitoring real-world interaction with the system. (vii) Educational Technology Integration Models: While not solely for attendance systems, models like SAMR (Substitution, Augmentation, Modification, and Redefinition) and RAT (Replacement, Amplification, Transformation) provide frameworks for effective technology integration. A less known model, SAMR (Security, Acceptance, Management, Realization), specifically addresses biometric integration by focusing on data protection, user acceptance, logistical management, and exploring the technology's full educational potential.

Research Methodology

This study employed a mixed-method research design to gain a comprehensive understanding of the attendance system development and validate the effectiveness of the biometric-based system. Quantitative Phase; The quantitative phase focused on collecting numerical data to assess the technical performance and efficiency of the BSMSLA. Data was be gathered on

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202542

attendance rates, accuracy of biometric scans, processing speed, and technical issues using surveys, system-generated data logs, and performance metrics. Statistical analysis quantify accuracy, identify attendance patterns, and assess the system's impact on attendance rates. Qualitative Phase; The qualitative phase aims to explore students' experiences, attitudes, and perceptions regarding the BSMSLA. Data will be collected through interviews, focus groups, and open-ended survey questions, providing insights into user experiences, satisfaction, challenges, and suggestions for improvement. Semi-structured interviews and focus group discussions will be conducted with students, lecturers, and administrators. The study's population consist of all students and lecturers in higher institutions in North-Central Nigeria, with a target population of all Federal Universities in this region. A multi-stage sampling technique was used: 300-level mathematics students from each chosen strata. This specific level is chosen because these students are stable and have two years of academic performance records for comparison, while Lecturers handling mathematics for 300-level students who use the package will be targeted for qualitative data.

Research Instruments

Structured Closed-Ended Questionnaire: Titled "Students' Attitude and Perception on the use of Biometric-based System for Monitoring Students' Lecture Attendance (SAPBSMSLA)". Open-Ended Focused Group Interview Protocol: This was used for the qualitative phase to delve deeper into lecturers' attitudes towards BSMSLA. Interviews audio-recorded with participant consent and transcribed immediately.

Validation and Reliability

Validity: Both the questionnaire and interview protocol were validated by subject matter experts in Information and Communication Technology, Educational Technology, and web/software design for clarity, suitability, language, and logical arrangement. Reliability: A pilot study was conducted with 300-level Computer Science students and lecturers (not part of the main sample). The Cronbach Alpha formula was used to determine internal consistency for the questionnaire, which yielded 0.75. For the interview protocol, an inter-rater scale and Cohen's Kappa formula was used to assess agreement in ratings. Data Analysis Data analysis was independently calculated for the quantitative and qualitative phases. Quantitative Data: Analysed using IBM SPSS Statistics software (version 23). Descriptive analyses describe data, understand variable distribution, and provide numerical analysis. Qualitative Data: provide description and content analysis, aiming to add depth to the quantitative findings.

Significance of the study

The development and implementation of the BSMSLA are expected to yield significant benefits across various stakeholders:

For Students:

i. Accurate and Reliable Records: Offers a more accurate and reliable method of tracking attendance, reducing proxy attendance and manual input errors.
ii. Punctuality and Responsibility: Encourages regular class attendance and punctuality by tracking presence.
iii. Real-time Data Access: Students can access their attendance records in real-time to track their own attendance and identify discrepancies.
iv. Convenience and User-friendliness: Provides quick and hassle-free entry into classrooms, eliminating physical cards or manual sheets.
v. Improved Engagement: Helps students reflect on attendance habits to improve engagement and participation.
vi. Support and Interventions: Facilitates timely interventions for students with attendance issues.
vii. Campus Security: Enhances security by ensuring only authorized students' access specific areas.

For Lecturers:

i. Automated Attendance Taking: Automates the process, saving time and effort, allowing more focus on teaching and student interaction.
ii. Reduced Administrative Workload: Traditional manual tracking is burdensome; the biometric system reduces this, freeing time for academic activities.
iii. Monitoring and Intervention: Enables easy monitoring of attendance patterns and early identification of at-risk students for timely support.
iv. Insights into Academic Performance: Attendance data can be correlated with academic performance, informing teaching strategies.
v. Teaching Effectiveness Evaluation: High attendance may indicate engaging lectures, prompting adjustments for low attendance.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202542

vi. Informed Decision-Making: Attendance data assists in making informed decisions about courses and resource allocation.
vii. Fosters Accountability: Students are aware their attendance is monitored, encouraging regularity.

For Researchers:

i. Accurate and Reliable Data: Provides high-quality attendance data for research analysis.
ii. Time Savings: Automates data collection, allowing more time for other research activities.
iii. Large-scale Data Collection: Facilitates large-scale data collection across multiple classes and courses, enabling robust analysis.
iv. Enhanced Validity: Helps control for attendance as a confounding variable in studies, improving internal validity.
v. Longitudinal Studies: Aids in conducting long-term studies on attendance patterns and their impact.
vi. Correlational Studies: Allows exploration of correlations between attendance rates and other variables like academic performance or engagement.
vii. Intervention Effectiveness: Provides evidence for the effectiveness of attendance-related interventions.
viii. Innovative Methodology: Showcases innovative research methodology in educational technology.
ix. Interdisciplinary Collaboration: Fosters collaboration among researchers from various fields.

For University Management:

i. Accurate Attendance Monitoring: Provides real-time data for identifying students with poor attendance and timely interventions.
ii. Resource Allocation: Enables better allocation of faculty, teaching assistants, and facilities based on actual attendance data.
iii. Efficient Data Management: Reduces paperwork and errors, leading to more efficient data management.

For Professional Organizations:

i. Efficient Training Tracking: Efficiently tracks attendance for training programs and workshops.
ii. Accurate Records for Compliance: Provides verifiable training attendance records for regulatory purposes.
iii. Automated Certification: Streamlines the process of generating completion certificates based on attendance.
iv. Efficient Resource Allocation: Helps plan for trainers, materials, and resources based on expected attendance.
v. Professional Development Tracking: Individuals can track their own professional development progress.
vi. Quality Assurance: Ensures training sessions are conducted as planned and participants are present.
vii. Enhanced Security: Adds a layer of security to events, ensuring only authorized participants' access resources.
viii. Event Management: Facilitates efficient management of conferences and seminars.
ix. Evidence for Funding/Grants: Serves as evidence of program impact and reach for funding purposes.

For Government:

i. Resource Allocation: Enables better allocation of resources to educational institutions based on actual student attendance data, ensuring effective utilisation.
ii. Improved Educational System: Leads to improved attendance tracking, resource optimization, enhanced accountability, and a more conducive learning environment.

Conclusion

The proposed BSMSLA system, leveraging biometric technology and adhering to relevant theoretical frameworks like TAM and UTAUT, is designed to significantly enhance attendance management in Nigerian higher institutions. By addressing the documented issues of traditional methods, it aims to improve data accuracy, streamline administrative tasks, promote student accountability, and ultimately contribute to better academic performance. The mixed-method approach will provide both quantitative evidence of its effectiveness and qualitative insights into user perceptions, paving the way for a more efficient and effective educational environment.

Recommendations

i. The use of automated attendance system in tertiary institutions offers tremendous benefits to lecturers and students as it also ease the demanding tasks of managing and maintaining of students information by lecturers and administrators of Nigerian tertiary institutions. Hence, need for further researches on the development of automated attendance system at different levels of education, allocation of more funds to conduct researches on automated attendance system in Nigeria by Government organizations, agencies and Non-Governmental Organizations,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202542

ii. procurement of technologies that can enhance the use of automated attendance system in schools.
iii. More conferences, seminars and workshops should be organized for Nigerian educational stakeholders to keep them abreast with the global emerging technologies on automated attendance system.
iv. Research institutes in Nigeria should consider designing and development of more automated attendance system for lecturers and students.

References

Alrawili, R., AlQahtani, A. A. S., & Khan, M. K. (2024). Comprehensive survey: Biometric user authentication application, evaluation, and discussion. *Computers and Electrical Engineering*, *119*, 109485.

Ardill, A. (2024). Student Attendance and Academic Performance. *Legal Educ. Rev.*, *34*, 159.

Ishaq, K., & Bibi, S. (2023). IoT based smart attendance system using RFID: A systematic literature review. *arXiv preprint arXiv:2308.02591*.

Kehtarnavaz, N., Parris, S., & Sehgal, A. (2022). *Smartphone-based real-time digital signal processing*. Springer Nature.

Khan, N., & Efthymiou, M. (2021). The use of biometric technology at airports: The case of customs and border protection (CBP). *International Journal of Information Management Data Insights*, *1*(2), 100049.

Pew Research Center. (2021). News Use Across Social Media Platforms in 2021.

Rjeib, H. D., Ali, N. S., Al Farawn, A., Al-Sadawi, B., & Alsharqi, H. (2018). Attendance and information system using RFID and web-based application for academic sector. *International Journal of Advanced Computer Science and Applications*, *9*(1).

Shete, A., Nangare, P., & Thakre, R. (2017). IoT Based Portable Attendance Device using Bio-metric system. *International Research Journal of Engineering and Technology*, *4*(5), 2395-0056.

Statista. (2021). E-Commerce Worldwide - Statistics & Facts

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202543

Quality of Guidance and Counseling Education in the Face of Insecurity in Public Schools in Nigeria

ABUBAKAR, Sadiq Haruna[1]
Email: asharuna@fugusau.edu.ng
Tel: 07066994040

ABDULWAHAB, Isah[1]
Email: abdulwahabisahrini01@gmail.com
Tel: 08064876857

AMINU, Umar[1]
Email: aminuunar7574@gmail.com
Tel: 08135497574

AUWALU, Rabiu
Email: auwalrabiu524@gmail.com
Tel: 07068262634

[1]Department of Educational Foundations, Federal University Gusau, Zamfara State

Abstract
Guidance and counseling education is essential for personal and academic development, career success, and psychological well-being. However, in Nigeria, insecurity-ranging from terrorism, banditry, kidnapping, and communal conflicts poses significant challenges to access, equity, and quality of G&C education. This paper examines the impact of insecurity on G&C education, explores disparities in access and equity, and suggests strategies to improve quality amid security challenges. The paper further examined the benefits of Guidance and Counseling structure, implementation and counseling intervention to address these challenges. The study revealed that counselors must play a role of career counseling and information counseling to create awareness on national and sensitive issues. The paper concluded that attachment theoretical model of psychotherapy can be applied in solving insecurity problems in the public school in Nigeria. The paper concludes by investigated the causes, and consequences of Insecurity, and also the role, importance and benefits of Guidance and Counseling towards insecurity in Nigeria.
Keywords: Guidance, Counseling, Insecurity, and Education.

Introduction
Guidance and counseling (G&C) education plays a critical role in addressing students' academic, emotional, and social needs. However, in Nigeria, insecurity has significantly affected the delivery of G&C services in schools, especially in conflict-prone areas. Issues such as attacks on schools, displacement of students and teachers, and inadequate funding have led to reduced access, inequalities, and a decline in quality. Guidance and counseling is fundamental to students and the individuals in the society. Mogbo, Obumneke and Anyachebelu (2011) defined guidance and counseling as a process of helping individuals to understand themselves and their world. In the context of this study guidance is an important component of educational service. The Federal Government of Nigeria (2004) realize the relevance of guidance services that it has stated in the National Policy on Education (2004) that it is desirable to provide guidance and counselors in secondary schools in Nigeria. According to Fafunwa in Mogbo (2011), the mandatory student guidance and counseling services is to provide the true condition and situation in Nigeria, security issues inclusive.

Education is the accumulated knowledge or experience that has positive effect on the individual character and behavioral. Education is a body of knowledge through which societal values and norms could be acquired. An individual needs guidance services in order to acquire the right type of education. Insecurity is an issue that people are concerned with. Udoh (2015) defined insecurity as the state of being subjected to danger or injury. Beland in Okarah (2014) defined insecurity as the state of fear or anxiety stemming from a concrete or alleged lack of protection. In the context of this paper insecurity implies high rate of incidences that are resulted in deaths and psychological trauma for individuals and families in different parts of Nigeria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202543

Nigeria has six (6) geo – political zone. The nature of insecurity takes various forms in different parts of these geo-political zones in Nigeria. Onyishi (20011) revealed that in the south-south the fear of kidnapping is the beginning of wisdom. Title holder, professionals and oil expatriates are not spare from kidnapping saga in the south- south Nigeria. In the south-west armed robbers have taken over different parts of the state. In the North-west, Boko haram activities has killed thousands of citizenries and rendered many homeless. The North-central seen not be spared from the endemic insecurity. People in the North central region battled with the herd men insurgencies. The aged, religious organizations, farmers, women and children are not speared from one form of insecurity and the other. It seems that there are various from of insecurity that existed in Nigeria.

Security Management in Nigeria

There are many strategies the individual and the government can use to avert insecurity and to achieve safety. One of the strategies is management of security in Nigeria. Emenike (2003) defined management as a process designed to ensure cooperation, participation, intervention and involvement in effective achievement of goals. Ochai (2013) defined management as the co-ordination of human and material resources in an organization in order to achieve goals. In context of this paper, management is defined as the process of planning, controlling, organizing, directing, coordinating and supervising human and material resources in order to attain stability, harmony and peace. Insecurity is influenced by geographic, economic and social factors. Management is an effective's tool to avert disparities in resource allocation that could lead to insecurity. Government can plan for the future of the nation. Ochai (2013) argued that government can plan for stability of the individuals and the entire nation. The national planning and Research Department in Nigeria can prepare a variety of plans to access and address challenges in areas ranging from housing and economic development, land use, transportation and food storage. National Research Study (2016) defined that comprehensive plan is a leading policy tool with legal significance. Effective planning can address insecurity and other security systems issues as important plan components. The development, adoption and implementation of security related goals and policies in Nigeria led to the establishment of the National Food Safety Management in 2017. According to (FRN, 2017), security is a multi-sectoral issue that requires proper coordination, planning and supervision. This led to the collaborative effort in the development of the National Policy on Safety and its implementation strategy. Security is one major tool of development and poverty reduction. Achieving stability, peace and harmony calls for effective Management of Nigerian resources that serve as growth and development of the nation Nigeria.

Benefits of Group Counseling

i. Peer Support: Students can share their experiences, providing emotional support and fostering understanding. This shared experience can reduce stigma associated with truancy.
ii. Skill Development: Group counseling can teach students valuable life skills such as communication, problem-solving, and conflict resolution, which may contribute to improved school attendance.
iii. Increased Motivation: Interaction with peers who are also working to overcome similar challenges may imbue a sense of motivation to attend school regularly.
iv. Parental Involvement: A group counseling program can also encourage parents to participate, allowing them to gain insights into their children's issues and learn how to support them.
v. Targeted Strategies: Counselors can identify common triggers or patterns among truant students and develop targeted strategies to help them engage more with their education.

The quality of guidance counseling in addressing insecurity in Nigeria's education system face several challenges. These challenges impact students' access to counseling services and the effectiveness of interventions designed to mitigate insecurity-related issues. Below are some key factors affecting equity and quality in guidance counseling:

Challenges to Equity in Guidance Counseling

i. Unequal Access to Counselors – Rural schools often lack professional counselors, leaving students in these areas without support.
ii. Socioeconomic Disparities – Wealthier schools tend to have better counseling services, while underfunded public schools struggle to provide adequate support.
iii. Cultural and Religious Barriers – Some communities may not fully embrace counseling due to cultural stigmas or religious beliefs.
iv. Gender Inequality – Female students, especially in conservative regions, may have limited access to counseling services, particularly concerning issues like gender-based violence.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202543

Challenges to Quality in Guidance Counseling

i. Shortage of Trained Counselors – There is an insufficient number of qualified guidance counselors in Nigerian schools, reducing the effectiveness of services.
ii. Inadequate Funding – Many schools lack resources to support counseling programs, affecting the quality of psychological and career guidance.
iii. Limited Training and Professional Development – Counselors often lack continuous training to address emerging issues, including insecurity-related trauma.
iv. Lack of Standardized Policies – The absence of clear national policies for school counseling leads to inconsistencies in service delivery.

Impact of Insecurity on Counseling Services

i. Increased Psychological Trauma – Students in conflict-prone areas face emotional distress due to kidnappings, terrorism, and violence.
ii. Displacement of Students and Counselors – Schools in insecure regions face frequent disruptions, making it difficult to sustain counseling programs.
iii. Fear and Distrust – Students and parents may hesitate to seek counseling due to fears of being targeted.

Possible Solutions

i. Recruitment and Training of More Counselors – The government should invest in training more guidance counselors, particularly in underserved areas.
ii. Integration of Trauma Counseling – Schools should incorporate trauma-informed counseling to help students cope with insecurity-related stress.
iii. Use of Technology – Online counseling services can bridge the gap for students in high-risk areas.
iv. Government Policies and Funding – Stronger policies and increased funding should support counseling services across all schools.
v. Community Involvement – Parents, religious leaders, and local organizations should be involved in promoting counseling services.

Improving guidance counseling in Nigeria's education system is crucial to addressing the psychological effects of insecurity and ensuring that all students receive the necessary support to thrive.

Quality of Guidance and Counseling Education in Nigeria

i. Limited training programs: Few institutions in Nigeria offer training programs for counselors, resulting in a shortage of qualified professionals.
ii. Outdated curriculum: The curriculum for guidance and counseling programs in Nigeria may not be up-to-date or relevant to the needs of contemporary students.
iii. Lack of resources: Schools and counseling programs often lack the resources needed to provide effective guidance and counseling services.

Equity of Guidance and Counseling Education in Nigeria

i. Disparities in access: Students from affluent backgrounds or those attending private schools may have better access to guidance and counseling services.
ii. Rural-urban disparities: Students in rural areas may have limited access to guidance and counseling services due to a shortage of qualified counselors.
iii. Gender disparities: Female students may face unique challenges in accessing guidance and counseling services due to cultural and societal norms.

Recommendations

The following have been recommended increase in the funding of guidance and counseling program, provision of more working tools, provision of adequate infrastructural facilities, provision of adequate security in public and private schools at all levels improvement of supervision of guidance and counseling programme, employment of more trained counselors, increase in the salaries of Counsellors and ensure constant training and retraining program for counselors.

i. The government should increase the funding of education at all levels and more allocation should be given to guidance and counseling programme in the school level.
ii. The government should employ more professional guidance and counseling teachers and deploy to the public schools to improve the service delivering of the guidance and counseling in schools across Nigeria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202543

iii. The government should ensure offices used as guidance and counseling rooms should be well furnish and all guidance and counseling resources are provided to motivate the students come for guidance and counseling services.
iv. The government should improve on the supervision of guidance and counseling programme in the schools. This will help to improve the quality of guidance and counseling services in the public schools across the country by employing more guidance and counseling supervisors and providing adequate funding for guidance and counseling supervision.
v. The government and school administrators should provide the working materials guidance and counseling teachers needs to carry out her/his responsibilities in the schools. Materials like record books, ICT facilities, pens etc.

Conclusion

In conclusion, the roles of counselors in the realization of the schools objective cannot be underestimated. Counsellors working in public schools in Nigeria are facing many challenges like kidnapping and banditry. This paper examined the challenges facing Counsellors in public and private schools in Nigeria and inadequate funding, lack of working tools, inadequate infrastructural facilities, insecurity problem, poor supervision, teaching of large classes, negatives attitude of students towards Counselors, negative relationship between counselors and school administrators, poor motivation and poor capacity development of supervisors were identified as challenges facing Counselors working in public schools in Nigeria. To solve these challenges, the presenters recommended the following: increase in the funding of guidance and counseling programme, provision of more working tools, provision of adequate infrastructural facilities, provision of adequate security in public schools, improvement of supervision of guidance and counseling programme, employment of more trained counsellors, increase in the salaries of Counsellors and ensure constant training and retraining programme for counselors.

References

Achimugu, L. (2000). The agonies of Nigerian teachers. Port Harcourt: Baron Press Limited.

Adeyemi, K., & Nwankwo, E. (2024). Addressing youth radicalization through counseling: A pathway to security in Nigeria. *Journal of Developmental Psychology,* 15(4), 78–90.

Adeyemo, D. A. (2017). Counseling and guidance in Nigerian schools. Ibadan: University Press.

Ekufu, R. N., & Anetoh, N. J. (2024). Role of secondary school counsellors in addressing insecurity-related issues among Nigerian students. COOU *Journal of Educational Research*.

Emenike, O. (2003). Educational management: Theory and practices. Enugu: *Empathy International Publishers.*

Federal Republic of Nigeria. (2004). National policy on education. Lagos: NERDC Press.

Federal Republic of Nigeria. (2017, February 7–8). National food safety. *Nigeria Food Safety Forum.*

Garba, H. K., Tanko, B. A., & Is-Haq, A. (2023). Impact of guidance services on academic achievement of senior secondary school students in public schools, Kwara State. *Journal of Education and Applied Psychology, 9(1).*

Ifeagachukwu, A., & Audu, C. B. (2021). Problems facing professional counselors in public secondary schools in Nigeria and way forward. *International Journal on Integrated Education,* 4(11), 197–205.

Ilu, O. A., & Ogo, A. (2013, September 24–27). Career counseling: A tool for national growth in a global world. *Paper presented at the Career Guidance International Conference, France.*

Mogbo, I. N., Obumneke, I. M., & Anyachebelu, F. E. (2011). Implementation of guidance and counseling services in Nigerian schools. *Journal of Emerging Trends in Educational Research and Policy Studies, 1(1), 2.*

National Association of School Counselors (NASC). (n.d.). Guidance and counseling in Nigeria. https://www.nasc.org.ng/guidance-and-counseling-in-nigeria/

National Bureau of Statistics. (2010). Population indicator: Federal Republic of Nigeria population report.

National Research Study. (2016). Report of the national population census. https://www.reportofpopulation

National Youth Development Policy. (2001). National youth policy. http://www.presidency/nationalyouthpolicy

Obasi, E. M. (2015). Guidance and counseling in Nigeria: Issues and challenges. *Lagos: University of Lagos Press.*

Ochai, G. (2013). Fundamentals of educational management. Makurdi: Success-World Press.

Odemelam, A. M., & Uwani, Y. A. (2009). A guide to the establishment of model guidance and counseling centres for the development of Nigerian university students. Owerri: *Bond Press.*

Ogunode, N. J., & Owobamigbe, K. D. (2021). Guidance & counselling services in Nigerian public primary schools: Challenges and the way forward. Central Asian Journal of Innovations on Tourism Management and Finance, 8(2), 29–37.

Okara, C. I. (2014). Causes and effects of insecurity in Nigeria: The challenges and relevance of the Nigerian Police Force (Unpublished master's thesis). Department of Public Administration, University of Nigeria.

Premium Times Nigeria. (2021). How insecurity, COVID-19 hampered Nigeria's education sector.

Reuters. (2024, March 14). Nigeria kidnappings break up families, keep children out of school.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202543

Sahabi, M., Aliyu, J., Ibrahim, S., Ibrahim, I., & Abubakar, I. (2024). Evaluation of factors influencing guidance and counselling programs in secondary schools in Sokoto Metropolis. Language Teaching and Educational Research, 7(2), 82–93.

UNESCO. (2015). Education in emergencies.

UNICEF. (2021). Schools closed and pupils disrupted amid insecurity in Nigeria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202544

Assessing the Impact of Social Media platforms on Dissemination of Christian Religious Messages in Kaduna State, Nigeria

HILLARY, Edward Zaman[1]
Email: hillaryzaman2020@gmail.com
07064317962

ISHAYA, Daniel[2]
Email: danielishaya4jesus@gmail.com
09018943436,

MUSA, Hassan[1]
Email: hassanmusa75@gmail.com
08060943947

BITRUS, Chagwa Bulamah[3]
bitrusbulamah@gmail.com
08139608746

[1]Christian Religious Studies Section, Department of Arts and Social Science Education, Faculty of Education Ahmadu Bello University, Zaria.
[2]Department of Educational Foundations and Curriculum, Faculty of Education, Yakubu Gowon University, Abuja
[3]Department of Christian Religious Studies, Federal University of Education, Zaria.

Abstract
This study investigated the impact of social media platforms on dissemination of Christian religious messages in Kaduna State, Nigeria, using a descriptive survey research design. A total of 423 respondents were randomly selected from a population of 1,897,432 Christians, and data were gathered through a structured questionnaire, with responses analyzed using mean scores. The self-structured questionnaire was validated by experts in the field and tested for reliability using a pilot study, yielding a high reliability coefficient of 0.75, indicating that the instrument was both valid and dependable for data collection. The findings revealed that social media Platforms plays a major role in spreading Christian religious messages by facilitating immediate communication, increasing youth involvement, and encouraging interfaith dialogue. However, it also brings challenges such as the spread of false information, misinterpretation of doctrines, commercialization of religion, and the potential for increased interreligious conflict. The study concludes that social media has become a key tool in religious communication in Kaduna State, offering both opportunities and risks. It recommends that the government work with media regulatory agencies to create and enforce guidelines that control the distribution of harmful or misleading religious content online, while also investing in digital literacy initiatives to promote responsible social media use. In addition, it advises religious leaders to create official, well-managed digital platforms for sharing accurate and theologically sound content and to use these platforms to engage with young people and promote peaceful coexistence among diverse religious groups.
Keywords: Social Media Platforms, Christian Religious Messages, Kaduna State

Introduction
The proliferation of digital technology has ushered in a transformative era in global communication, and nowhere is this more evident than in the rapid spread of social media platforms. These platforms have significantly reshaped how information, including religious messages, is disseminated and consumed across various societies. In Nigeria, particularly Kaduna State, the rise of platforms such as Facebook, WhatsApp, YouTube, and Twitter has facilitated unprecedented access to religious teachings, spiritual inspiration, and doctrinal engagement. This has blurred the lines between traditional religious communication and modern technological expression, fostering a dynamic interface between faith and digital connectivity (Adeniyi, 2021). Historically, religious messages in Nigeria were primarily communicated through oral traditions, physical gatherings, and print media. However, the advent of social media has introduced a paradigm shift, allowing religious leaders,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202544

institutions, and individuals to reach large audiences beyond geographical boundaries instantaneously (Okon, 2020). Kaduna State, being one of Nigeria's most religiously diverse and sensitive regions, presents a unique context for examining how social media influences religious communication. This state experiences vibrant interactions among Christianity, Islam, and indigenous beliefs, all of which are increasingly represented online, often with significant social consequences. The growing accessibility to smartphones and internet services has democratized religious expression, enabling even laypersons to share sermons, prayers, prophetic declarations, and religious debates. While this has increased spiritual awareness and participation, it has also contributed to doctrinal controversies, misinformation, and at times, interreligious tensions (Ogunlade, 2022). The social media space in Kaduna has become a battleground where religious ideas compete, often without proper theological guidance, leading to misinterpretations and the spread of extremist ideologies in some instances. Moreover, the anonymity and immediacy afforded by social media allow for the amplification of both moderate and radical religious views. The viral nature of content can escalate seemingly minor theological disagreements into major public debates. In some cases, messages that would have been restricted to congregational settings now receive national or even global attention, thus magnifying their influence and potential for impact—positively or negatively (Ibrahim, 2019). This dynamic calls for a critical evaluation of the digital religious landscape, especially in areas prone to sectarian conflict such as Kaduna.

In educational and spiritual terms, social media also serves as an informal platform for religious learning. Online Bible studies, Quranic recitations, theological podcasts, and interfaith dialogues are frequently hosted, giving followers more flexible access to religious education. However, the lack of regulation over content raises questions about authenticity, interpretation, and doctrinal purity (Eze, 2023). This is particularly important in Kaduna State, where the religious fabric is tightly interwoven with political and ethnic identities, making the stakes of miscommunication considerably higher. In addition, the influence of social media on religious youth cannot be overstated. Young people in Kaduna increasingly turn to social platforms for religious identity, guidance, and community. This presents opportunities for mentorship and faith development but also risks exposure to spiritual manipulation and ideological indoctrination (Danladi, 2021). Understanding the motivations and effects of religious social media use among youth is essential for religious leaders, educators, and policymakers seeking to guide healthy spiritual formation in the digital age.

Social Media Platforms and Religious Messages in Nigeria

Social media Platforms has emerged as a transformative force in the dissemination of religious messages in Nigeria, redefining how faith-based communication is conducted across the country. With platforms like Facebook, WhatsApp, Twitter, Instagram, and YouTube becoming widespread, religious institutions and individuals now have direct, immediate access to vast audiences. This digital shift marks a departure from traditional models of religious communication that relied on physical gatherings, printed tracts, and radio sermons. According to Ibe (2020), the democratization of message production and distribution through social media has empowered even lay believers to assume roles once reserved for ordained clergy, thus decentralizing religious authority and expanding the scope of spiritual engagement. The appeal of social media Platforms in religious contexts lies in its capacity to foster interaction, immediacy, and inclusivity. In contrast to one-way communication modes of traditional media, social platforms enable real-time feedback, community building, and participatory dialogue among believers. For instance, pastors and imams now host live prayer sessions, theological discussions, and spiritual counseling via livestreams, fostering a sense of virtual fellowship. Olatunji (2019) noted that this interactive nature enhances followers' spiritual connection and facilitates continuous engagement outside of physical worship spaces, especially among youths and diaspora communities.

Despite these benefits, the unregulated nature of social media raises concerns about the credibility and doctrinal soundness of the religious messages shared. The absence of formal theological review mechanisms means that any user can propagate religious ideas, which may be misleading, heretical, or inflammatory. Musa (2021) highlighted that many self-acclaimed preachers exploit the digital space to promote personal ideologies, manipulate scriptures, or propagate sensational content to gain followers and financial contributions. This trend has contributed to spiritual confusion among some audiences and has, in extreme cases, fostered the spread of radical or extremist views that threaten religious harmony. The Nigerian religious landscape is characterized by high levels of religious sensitivity, making the misuse of social media particularly volatile. In a multi-religious society with a history of ethno-religious tensions, provocative or misinterpreted online messages can escalate into offline conflicts. Nwankwo (2022) observed that inflammatory posts shared during religious holidays or political campaigns often trigger interfaith confrontations, especially in states like Kaduna, Jos, and Kano. The viral nature of social media content exacerbates this risk, as unverified or emotionally charged messages can be widely disseminated before

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202544

authorities can intervene or respond. Another key concern lies in the commodification of religion on social media. Many religious leaders now use social platforms not only for spiritual purposes but also for commercial ventures, branding themselves as influencers. This fusion of religious messages with entertainment and marketing dilutes the sanctity of religious discourse and shifts focus from spiritual growth to popularity and material gain. According to Adebayo (2023), this development contributes to the rise of a "celebrity clergy culture" where spiritual leaders prioritize followers, likes, and shares over genuine pastoral care or theological depth. Moreover, social media is reshaping religious identity and belonging, especially among Nigerian youths. Young people increasingly consume religious content in snippets—memes, short videos, and tweets leading to fragmented understanding of complex doctrines. While this bite-sized information format suits digital culture, it often lacks context and depth. Uchenna (2020) argues that such superficial engagement with faith may lead to spiritual immaturity, where religion becomes more performative than transformative. This raises questions about the long-term impact of social media on religious formation and ethical behavior. On a more positive note, social media has become a platform for interfaith dialogue and peacebuilding among religious communities in Nigeria. By facilitating cross-religious conversations, digital media provides an avenue for mutual understanding and tolerance. Ibrahim (2021) reported that several NGOs and religious groups have successfully used Twitter and Facebook to counter hate speech, promote religious harmony, and respond swiftly to misinformation. These efforts demonstrate the potential of social media not only to divide but also to unite, depending on how it is managed and moderated.

The emergence and widespread use of social media platforms have significantly altered the landscape of religious communication in Kaduna State, Nigeria. While traditional methods of disseminating religious messages such as sermons in places of worship, religious radio programs, and print literature remain relevant, they are increasingly being replaced or supplemented by digital platforms such as Facebook, WhatsApp, YouTube, and Instagram. This transformation raises critical concerns about the authenticity, interpretation, and regulation of religious content circulated online, especially in a region like Kaduna where religion is deeply intertwined with ethnic identity and political sensitivity. The unfiltered nature of social media often leads to the propagation of controversial, doctrinally unsound, or even inflammatory religious messages without accountability or oversight. Furthermore, the ability of social media to rapidly disseminate religious messages has introduced new dynamics into interfaith relations in Kaduna State, which is known for its religious diversity and history of ethno-religious conflict. While these platforms offer opportunities for greater religious awareness and interfaith engagement, they also risk escalating tensions through the spread of hate speech, religious intolerance, and radical ideologies. Religious messages shared online can easily be misinterpreted or taken out of context, potentially fueling division and violence. There is, therefore, a growing concern about how religious actors and followers are engaging with social media and the consequences this may have for peace and coexistence in the state. Despite the critical role of social media in shaping public religious discourse, there is a noticeable gap in empirical studies addressing its influence on the spread of religious messages within Kaduna State. Most available research tends to focus broadly on media and religion in Nigeria without adequately addressing the unique socio-cultural and religious dynamics of Kaduna. As such, there is a need to investigate how social media is being used by religious communities in the state, the nature and content of messages being shared, and the broader implications for religious understanding, cohesion, and conflict. Addressing this gap is essential for developing informed strategies that promote responsible religious communication in the digital age.

Purpose of the Study

The purpose of this study is to examine the assessment of the impact of social media on dissemination of Christian religious messages in Kaduna State, Nigeria. Specifically, the study seeks to explore how social media platforms such as Facebook, WhatsApp, YouTube, and Twitter are being utilized by religious individuals and institutions to communicate faith-based content.

Research question

What is the impact of social media on the dissemination of Christian religious messages in Kaduna State, Nigeria?

Research hypothesis

Ho_1: There is no significant difference between the impact of social media platforms for the dissemination of Christian religious messages in Kaduna State.

Methodology

The study employed a descriptive survey research design, focusing on respondents residing in Kaduna State, Nigeria. A simple random sampling method was utilized to select 459 respondents from a total population of 1,897,432. Data collection was

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202544

carried out using a well-structured questionnaire. Out of the distributed questionnaires, 423 were duly completed and returned, resulting in a 92.2% response rate. The self-structured questionnaire was validated by experts in the field and tested for reliability using a pilot study, yielding a high reliability coefficient of 0.75, indicating that the instrument was both valid and dependable for data collection. Respondents were randomly selected from eight local government areas within the state using simple random sampling technique. The distribution and collection of the questionnaires were handled by the researcher in collaboration with five trained research assistants. Data analysis was conducted using the Statistical Package for Social Sciences (SPSS) version 20. The responses were evaluated using a four-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). A decision benchmark was set at a mean score of 2.50, with scores at or above this threshold considered indicative of agreement, and scores below representing disagreement. The hypothesis of the study was tested using t-test statistical analysis at a 0.05 level of significance.

Presentation of Result

Research question 1

What is the impact of social media on the dissemination of Christian religious messages in Kaduna State, Nigeria?

Table 1: Opinions of Respondents on impact of social media on the dissemination of Christian religious messages in Kaduna State, Nigeria

S/N	Item Statements	SA	A	D	SD	Mean
1	Social media enables instant dissemination of religious messages to a large and diverse audience in Kaduna State.	242	41	72	68	3.08
2	Religious leaders use platforms like Facebook and WhatsApp to share sermons, prayers, and spiritual reflections.	263	38	71	51	3.21
3	Social media facilitates real-time interaction between religious leaders and followers, enhancing engagement.	287	38	64	34	3.37
4	Youths in Kaduna increasingly rely on social media for spiritual guidance and religious identity formation.	300	37	68	18	3.46
5	Social media provides a platform for interfaith dialogue and religious tolerance initiatives.	314	38	65	6	3.56
6	Unregulated religious content on social media sometimes leads to the spread of misinformation and doctrinal errors.	99	168	65	91	2.65
7	The viral nature of social media amplifies religious messages, both moderate and extremist.	120	163	64	76	2.77
8	Social media reduces the reliance on physical places of worship for religious learning and communication.	139	162	65	57	2.91
9	Religious messages on social media are often commercialized, blurring the line between spirituality and entertainment.	162	156	65	40	3.04
10	Inflammatory or provocative religious posts on social media have the potential to escalate interreligious tensions in Kaduna State.	194	143	79	7	3.24
	Cumulative					**3.13**

Decision Mean=2.50

Table 1 reveals that all the items recorded mean scores exceeding the benchmark of 2.5. The individual item means ranged from a minimum of 2.60 to a maximum of 3.56, suggesting that participants generally agreed with the statements presented. The overall mean of 3.13, which is clearly above the threshold, indicates a strong recognition by respondents of the impact of

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202544

social media platforms in disseminating Christian religious messages in Kaduna State. Therefore, each item's mean was deemed acceptable and retained for further analysis.

Hypothesis

Ho_1: There is no significant difference between the impact of social media platforms for the dissemination of Christian religious messages in Kaduna State.

Table 2: Summary of One Sample T-Test on impact of social media platforms for the dissemination of Christian religious messages in Kaduna State

Variable	N	Mean	Std.	Mean diff	Decision
Hypo[1]	423	3.0804	1.17565	3.08038	0.00

Table 2 presents the results of the One-Sample T-Test conducted to evaluate the impact of social media platforms for the dissemination of Christian religious messages in Kaduna State. The study involved 427 respondents. The analysis produced a mean score of 3.0804 with a standard deviation of 1.17565, indicating a moderate spread in the responses. The observed mean difference of 3.08038 from the test value demonstrates a statistically significant effect, thereby confirming the influential impact of social media in disseminating Christian religious messages within the state. As a result, the null hypothesis suggesting no significant impact of social media platforms on disseminating Christian religious message is rejected.

Discussion of findings

The main objective of this study was to evaluate the impact of social media on the dissemination of Christian religious messages in Kaduna State, Nigeria. Through the analysis of data collected from respondents, the findings demonstrate that social media plays a significant role in shaping Christian religious communication. It facilitates immediate and widespread sharing of religious content, especially through platforms like Facebook, WhatsApp, and YouTube. The study shows that these platforms are widely used by religious leaders and followers to share sermons, spiritual reflections, and religious teachings, leading to increased engagement, particularly among youths. Additionally, social media has created a virtual space for interfaith dialogue, fostering mutual understanding among different religious groups in the state. However, the study also highlights several concerns associated with this digital shift in religious communication. While social media offers accessibility and wide reach, it also contributes to the spread of unverified and misleading religious content. The absence of proper regulation allows for doctrinal misinterpretation, commercialization of faith, and, in some cases, the promotion of divisive or inflammatory messages that could heighten interreligious tensions. These findings align with the assertion of Ibe (2020), who noted that although social media has revolutionized religious communication, it must be used with caution and responsibility to avoid spiritual confusion and societal conflict. Thus, the study calls for a more structured and ethical use of social media in religious dissemination across Kaduna State.

The result of the study confirms that social media has a significant influence on the dissemination of religious messages in Kaduna State, aligning with the position of Eze (2023), who emphasized the growing role of digital platforms in shaping religious communication. The One-Sample T-Test presented in Table 2 shows that the 427 respondents largely acknowledged the impact of social media, with a mean score of 3.0804 and a standard deviation of 1.17565. This statistical outcome reflects a moderate but consistent agreement among participants regarding the effectiveness of platforms such as Facebook, WhatsApp, and YouTube in spreading religious content. The notable mean difference from the hypothesized value signifies that the effect is not due to chance but reflects a real and observable influence in the community. Furthermore, the rejection of the null hypothesis, which stated that social media has no significant influence on the spread of religious messages, further solidifies the conclusion that social media plays a central role in religious communication in Kaduna State. This finding supports Eze's (2023) argument that the digital space has become a vital arena for spiritual interaction, evangelism, and religious expression. However, it also implies the need for caution, considering the possible misuse of these platforms for spreading inaccurate or harmful religious information. Therefore, while social media serves as a powerful tool for religious outreach and engagement, its use must be guided by responsibility, ethical standards, and a commitment to promoting peace and doctrinal soundness.

Conclusion

The study concludes that social media has become a powerful tool for the dissemination of Christian religious messages in Kaduna State, offering religious leaders and followers a platform for real-time interaction, spiritual engagement, and broader

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202544

outreach. It plays a vital role in shaping religious identity, especially among the youth, and promotes interfaith dialogue and tolerance through accessible and diverse digital content. The immediacy and reach of platforms such as Facebook, WhatsApp, and YouTube have enabled religion to transcend traditional boundaries, thereby transforming how faith is communicated and practiced in the state. However, the study also concludes that the unregulated nature of social media presents significant challenges, including the spread of misinformation, doctrinal confusion, and the commercialization of religious messages. In addition, provocative religious content has the potential to incite interreligious tensions in a socially sensitive environment like Kaduna. These findings highlight the need for a more responsible and guided use of social media by religious actors, as well as the implementation of digital content regulation and public awareness to ensure that religious communication online contributes to peace, unity, and spiritual growth.

Recommendations

Based on the findings of the study, it recommends that:

i. The government should collaborate with media regulatory bodies to develop and enforce policies that monitor and curb the spread of harmful or misleading religious content on social media, while also supporting digital literacy programs that promote responsible online engagement among citizens in Kaduna State.
ii. Religious leaders should establish official and well-managed social media channels for disseminating accurate and theologically sound messages, while actively engaging youths online to counter misinformation and foster peaceful interfaith interactions.

References

Adebayo, M. K. (2023). Religious branding and the rise of celebrity pastors in the Nigerian digital space. *Journal of Contemporary Religion and Media*, 9(2), 54–68.

Adeniyi, K. S. (2021). The digital pulpit: The role of social media in contemporary religious communication in Nigeria. *African Journal of Communication and Media Research*, 33(2), 45–60.

Danladi, M. T. (2021). Social media and youth religiosity in Kaduna State: An exploratory study. *Kaduna Journal of Sociology and Religion*, 11(1), 57–74.

Eze, C. J. (2023). Media ethics in religious messaging: A critique of Nigerian online religious content. *Journal of Media and Society*, 6(2), 99–113.

Ibe, C. A. (2020). Digital evangelism and the redefinition of religious authority in Nigeria. *Journal of Religion and Social Transformation*, 14(2), 45–59.

Ibrahim, H. M. (2021). Faith online: Social media and interfaith dialogue in Northern Nigeria. *Journal of Media, Religion and Conflict Resolution*, 8(1), 67–83.

Ibrahim, Y. B. (2019). Online religious rhetoric and communal relations in Northern Nigeria. *Conflict and Communication Online*, 18(3), 22–35.

Musa, L. A. (2021). The impact of social media on religious messaging and doctrinal purity in Nigeria. *Journal of Theology and Media Culture*, 5(3), 77–89.

Nwankwo, B. O. (2022). Social media and religious conflict in Nigeria: A case study of Kaduna and Plateau States. *Journal of Peace and Interreligious Dialogue*, 10(1), 101–117.

Ogunlade, A. R. (2022). Social media and religious pluralism: Blessing or curse? Evidence from Northern Nigeria. *Journal of Religion and Media Studies*, 9(1), 76–90.

Okon, E. E. (2020). Religious communication in the digital age: A Nigerian perspective. *International Journal of Theology and Religion*, 12(4), 115–129.

Olatunji, T. A. (2019). New media and the dynamics of worship in Nigeria. *African Journal of Communication and Religious Studies*, 7(1), 33–48.

Uchenna, J. N. (2020). Youth, faith, and fragmented theology: Religious consumption in the age of social media. *Nigerian Journal of Youth and Religion*, 6(4), 122–136.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202545

Effect of Systematic-Desensitization-Counselling Technique on Social Anxiety among Secondary School Students in Nassarawa Zonal Education Directorate, Kano State, Nigeria

SAI'DU, Hajara Tabawa[1]
Email: hajratea@gmail.com
Tel: 07035997289

MUSTAPHA, Ibrahim Abdullahi[1]
mustaphaia@yahoo.com
08036475574

YUSUF, Musa Kibiya[1]
yusufkibiya@gmail.com
08035818755

[1]Department of Educational Foundations, Northwest University, Kano

Abstract
The study investigated the effect of systematic desensitization counselling techniques on social anxiety among secondary school students of Nassarawa Zonal Education Directorate, Kano State, Nigeria. Three hypotheses focusing on cognitive, behavioral and physiological dimensions of social anxiety were tested at 0.05 level of significance. The study adopted quasi-experimental research design in form of pre-test and post-test design only. The target population consist of 2,737 secondary school students identified with social anxiety out of which 30 students were sampled to participate in the study through purposive sampling technique. Two data collection instruments were used for the study: Social Anxiety Identification Checklist (SAIC) with the reliability of stability coefficient of r =.832 was established. Student Social Anxiety Inventory (SSAI) was the instrument used to quantify the severity of the Social Anxiety. The participants were assigned to treatment using Systematic Desensitization technique. Statistical analysis using paired sample t-test was used. Results obtained from the study indicated significant effect of on social anxiety among secondary school students with t = 4.750, p=0.001), t = -28.957, p=0.001) and t = -20.003, p=0.001). The results equally showed that there is significant effect of Systematic Desensitization Technique on the three dimensions of social anxiety among secondary school students with t = -3.117, p=0.004). t = -3.772, p=0.001) and t = -7. 910, p=0.001). In conclusion, Systematic Desensitization techniques was effective in treating social anxiety among Secondary School Students. Based on the findings, it was recommended among others, that Schools' Counsellors should make good use of systematic desensitization techniques in counselling students with social anxiety.

Keywords: Social anxiety, Systematic desensitization technique, Counselling interventions

Introduction
One of the most extensive research areas in recent decades has been anxiety and its related fields. Social anxiety is one of the most common psychological problems experienced in the present time. Due to its prevalence, many studies have investigated it as one of the most crucial emotional problems causing several psychological and behavioral problems. People with social anxiety experience fear and uneasiness in social performance and interactional situations, which have a significant negative impact on the various aspects of their life. Social anxiety is considered as one of the most psychological problems related to secondary school students. It manifested by face flushing, sweating, termer, and speech struggling to a degree observed by the surrounding. Individuals who suffer from social anxiety usually fear meeting people or speaking to them. Cavalho (2017) reported that social anxiety among secondary school students has forced many schools to introduce various activities to inspire students to make their stay in school a pleasurable event. Students with Social Anxiety are likely to avoid participation in school events, such as being reluctant to contribute to class discussions and shunning opportunities for academic advancement as well as extra-curricular events. Social anxiety among secondary school students decreases performance in the class, make them alcohol dependent, avoid verbal presentations, and result in poor performance in class test. Although many efforts made by various stakeholders like parents, teachers, religious leaders and school counsellors seem to have helped in one way or the other in ameliorating the plight of social anxious students, the problem still persists. Social anxiety is prevalent psychological challenges among secondary school students, affecting their academic performance, social interactions and overall well-being.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202545

Social anxiety is a pervasive concern among adolescents particularly in secondary schools where social interactions and performance expectations are constant. It manifests through fear of negative evaluation, social avoidance and distress and physiological symptoms of anxiety. When left untreated, social anxiety can significantly impact students' confidence, participation and academic success.

Social anxiety can be classified in to three dimensions namely cognitive dimension, behavioural dimension and physiological dimensions (Emslie, 2018). Cognitive social anxiety occurs when people with social anxiety often engage in negative self-evaluation, perceiving themselves as inadequate or fearing they will be judged harshly by others. According to Clark and Wells' cognitive model of social anxiety individuals with social anxiety tend to have distorted beliefs about themselves, others, and the social situation, which fuel their anxiety. Anticipatory anxiety is another cognitive component where individuals experience intense worry and fear leading up to a social event. They may ruminate about potential negative outcomes and overestimate the likelihood of social mishaps, as proposed by (Hofmann, 2017). Cognitive dimension of social anxiety manifests in students' negative thoughts and self-perceptions such as fear of failure or rejection, excessive self-consciousness and overestimation of others' judgement. According to cognitive models of social anxiety, people who have social anxiety's worry about how other people will see them (Leibowitz, 2019). After the action, they could pay close attention to themselves, feel extremely self-conscious, or hold themselves to a high level of performance. The social Counselling hypothesis of self-presentation states that a person with this problem makes an effort to act politely toward others but feels incapable of doing so. Oftentimes, before the social event that could cause anxiety, sufferers would consciously go over what could go wrong and how to handle each unforeseen situation. They might think that their performance wasn't up to standard after the occasion. They will therefore go over everything that might have been unusual. These ideas could linger for weeks or longer rather than ending abruptly after the interaction.

The behavioural component of social anxiety involves observable actions, reactions, or avoidance behaviours that individuals with social anxiety engage in response to social situations. Individuals with social anxiety often experience intense fear in social situations, and these emotions can drive specific behaviours aimed at minimizing or avoiding perceived negative outcomes. Individuals with social anxiety frequently exhibit avoidance behaviours as a means of managing their anxiety. They may actively avoid social situations or endure them with significant distress. According to the cognitive-behavioural model proposed by Clark and Wells (1995), avoidance is a central feature of social anxiety, perpetuating and exacerbating the individual's fear. This model suggests that avoidance behaviours serve as safety behaviours, providing a temporary reduction in anxiety but ultimately maintaining and reinforcing social anxiety over time. Behavioural social anxiety can be seen among students, behavioural manifestations of social anxiety include avoiding social situations or using safety behaviours (rehearsing conversations in advance, avoiding eye contact) to mitigate anxiety. These behaviours are aimed at reducing the perceived threat of social situations but can perpetuate the problems. Behavioural dimension of social anxiety also manifests in students' avoidance of social interactions, public speaking and participation in group activities. Physiological component of social anxiety often elicits heightened physiological arousal, such as increased heart rate, sweating, and muscle tension. Some individuals with social anxiety may experience noticeable physiological dimensions, such as blushing or trembling, which can be a source of embarrassment and further increase anxiety (Schulz, 2016). The physiological component of social anxiety involves the autonomic nervous system's response to social situations, leading to observable physiological reactions. Individuals with social anxiety often experience heightened physiological arousal, marked by changes in heart rate, sweating, and other bodily functions, in response to perceived social threats. Physiological dimension of social anxiety includes physical symptoms such as excessive sweating, rapid heartbeat, trembling and nausea when facing social situations.

Social anxiety is treated by using many counselling techniques like cognitive restructuring, social skills training, life skills training, differential reinforcement technique, miscellaneous behavior change, self-instructional strategies, systematic desensitization, assertiveness `training among others which many researches show their effectiveness in the treatments of social anxiety. Despite the increasing awareness of social anxiety problems many affected students in Nigerian secondary schools lack access to effective psychological interventions. Among these intervention approaches are cognitive restructuring (CR) and systematic desensitization (SD) which are two widely recognized approaches in cognitive-behavioural theory (CBT) for anxiety problems (Hofmann, 2012). Systematic desensitization employs gradual exposure to anxiety-provoking situations combined with relaxation techniques (Leitenberg, 2019). Systematic desensitization is also type of behavioural techniques based on the principle of classical conditioning. This approach aims to remove the fear response of anxiety and substitute a relaxation response to the conditional stimulus gradually using counter conditioning. Systematic desensitization is a technique procedure

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202545

based on social learning principles for the treatment of maladaptive fears. The client is taught to relax and then imagine a graded sequence of scenes that are progressively more fear-provoking. By experiencing the stimuli during a relaxed state that is incompatible with fear, the emotional reaction to the stimuli is gradually weakened. Systematic desensitization technique has been found to significantly reduce behavioural avoidance and physiological symptoms of social anxiety among students. It is against this background that this study investigated the effects of cognitive restructuring and systematic desensitization counselling techniques on social anxiety among secondary school students of Nassarawa Zonal Education Directorate, Kano State, Nigeria.

Many students in Nassarawa Zonal secondary schools Kano State, are frequently preoccupied with negative view of themselves, feel rejected, act foolishly and scared that others may laugh at them when performing a task in the class. As an experienced teacher, students found themselves in a situation arising from their inability to interact appropriately, build and maintain interpersonal relationship with their peers and other adolescents in the school and around them. Most of them are found to be keeping to themselves all the time, when they are in the midst of their peers, they prefer being quiet, keep to themselves or doing thing on their own. They rarely interact, ask or answer questions in the class or outside the class and most time they look lonely, isolated and sad; at time, some of them become aggressive when forced by their peers to interact. These Students, at different times are likely to fall victim of bullying, victimization and neglect by their peers, noticing and uncaring teachers and other adult. The lack of interpersonal relationship skills has really denied them of the care and support, love, trust and encouragement they deserve from both within and outside the school. Observations made by the researcher that, as an experienced teacher have shown that, social anxiety appears to be on the increase among secondary students in Nassarawa zonal education directorate and may become a threat to effective teaching and learning if not checked. Students who are victims of social anxiety report fear of going to school, physical dimensions of illness, some level of depression, nervousness, progressive lower level of self-esteem and diminished ability to learn in the school. School authority as well as school counsellors have been adopting the routine conventional counselling, and through educational, vocational and persona-social counselling to tackle the situation. But the orientation programmes fail to remove the effect of social anxiety, despite all these efforts, social anxiety still exists in many students especially those that do not have a chance and ready to socialised which may reflect in their performance. These meas ures have not solved the problem of social anxiety among the students.

Counsellors have come up with various counselling techniques among which is systematic desensitization technique. This technique was used as an approach to the treatment of behaviour problems that try to help individuals behave more adaptively by modifying their thoughts. The emphasis is on the effect of thought on behaviour and behaviour change technique. The technique strives to change misconceptions, strengthen coping skills, increase self-control and encourage self-reflection. As such the present study investigated 'The effect of Systematic Desensitization counselling techniques on Social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano State.'

Objectives of the Study

Specifically, the objectives of the study are to determine:

1. The effect of Systematic Desensitization technique on Cognitive dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano;
2. The effect of Systematic Desensitization technique on Behavioural dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano;
3. The effect of Systematic Desensitization technique on Physiological dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano.

Research Questions

The following research questions were raised:

1. What is the effect of Systematic Desensitization technique on Cognitive dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano?
2. What is the effect of Systematic Desensitization technique on Behavioural dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano?
3. What is the effect of Systematic Desensitization technique on Psychological dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano?

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202545

Research Hypotheses

The following null hypotheses were tested at the 0.05 level of significance.

Ho$_1$: There is no significant effect of Systematic Desensitization on Cognitive dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano.

Ho$_2$: There is no significant effect of Systematic Desensitization on Behavioural dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano.

Ho$_3$: There is no significant effect of Systematic Desensitization on Psychological dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano.

Methodology

The research design adopted for this study is Quasi-Experimental Design involving the pre-test post-test design only. This design involves a pre-test of the subjects before the introduction of the treatment followed by a post-test of the subjects after the treatment. According to Kothari (2013), in such a design a single test group or area is selected and the dependent variable is measured before the introduction of the treatment. Hence, the design was relevant for this study because of its advantage of testing the results obtained from pre-test and post-test in order to analysed the effect or otherwise. The population of this study comprises of 333 Senior Secondary Students identified with social anxiety in Nassarawa ZED 2024/2025 academic session using the adapted Students Social Anxiety Checklist (SSAC). The Students Social Anxiety Inventory (SSAI) was used for the pretest and posttest to measure cognitive, philological and behavioural dimensions of social anxiety. Both instruments were validated and found reliable through pilot tasting, with co-relation co-efficient of r =.832 was established.). For overall data collection involved administering the adopted Social Anxiety Identification Checklist (SAIC) to identify students with social anxiety followed by Students Social Anxiety Inventory (SSAI) during the pretest. After 10 weeks of Systematic Desensitization Counselling technique intervention, a posttest was administered. For the data analyses techniques, paired sample t-test was used.

Presentation of Results

The data for this study were analysed and presented based on the three (3) null hypotheses. Null hypotheses 1-3 were tested using paired sample t-test at alpha 0.05 level of significance. The results were presented in tables below.

Ho$_1$: There is no significant effect of Systematic Desensitization on cognitive dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano State.

Table 1: Paired Sample t-test on the Effect of Systematic Desensitization Counselling Technique on Cognitive Dimension of Social Anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano State

Variable	Group	N	*Mean*	SD	Df	*t*-Cal	*p*-Value
Cognitive Dimension of Social Anxiety	Pre-Test	15	10.26	3.685	29	-3.117	0.004
	Post-Test	15	13.60	4.694			

**** Significant at p < 0.05***

The results in Table 4.5 showed that $t(29) = -3.117$, while $p = 0.004$. Since the probability value (p=0.004) is less than the alpha level of significance ($\alpha = 0.05$), the null hypothesis which is states that there is no significant effect of Systematic Desensitization counselling technique on cognitive dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano State is rejected. These findings indicate that the systematic desensitization technique had a significant positive effect on the cognitive dimension of social anxiety. This implies that using systematic desensitization counselling technique is effective on cognitive dimension of social anxiety among secondary school students.

H0$_2$: There is no significant effect of Systematic Desensitization on Behavioral dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano State.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202545

Table 2: Paired Sample t-test on the Effect of Systematic Desensitization Counselling Technique on Behavioral Dimension of Social Anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano State

Variable	Group	N	Mean	SD	Df	t-Cal	p-Value
Behavioral Dimension of Social Anxiety	Pre-Test	15	15.06	4.798	29	-3.772	0.001
	Post-Test	15	21.46	8.080			

**** Significant at p < 0.05***

The results indicated that t (29) = -3.772, and p = 0.001. Given that the p-value (0.001) is less than < the alpha level of significance (α =0.05), the null hypothesis which states that there is no significant Effect of Cognitive Restructuring on Physiological Dimension of Social Anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano is rejected. This demonstrates that the systematic desensitization technique had a significant effect on the behavioural dimension of social anxiety among secondary school students.

$H0_3$: There is no significant effect of Systematic Desensitization on Physiological dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano State.

Table 3: Paired Sample t-test on Effect of Systematic Desensitization Counselling Technique on Physiological Dimension of Social Anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano State

Variable	Group	N	Mean	SD	Df	t-Cal	p-Value
Physiological Dimension of Social Anxiety	Pre-Test	15	8.13	3.224	29	-7. 910	0.001
	Post-Test	15	15.26	3.657			

**** Significant at p < 0.05***

Table 4.7 revealed that t (29) = -7. 910, p < .001. Since the probability value (p=0.001) is less than the alpha level of significance (α = 0.05), the null hypothesis which is states that there is no significant effect of Systematic Desensitization counselling technique on cognitive dimension of social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, Kano State is rejected. This implies that systematic desensitization counselling technique had a significant effect on the physiological dimension of social anxiety among secondary school students.

Discussion of Findings

Results from hypothesis 1 the finding showed that there was significant effect of Systematic Desensitization Technique (SDT) on cognitive dimension of social anxiety among secondary school students of Nassarawa Zonal Education Directorate, Kano State (t = -3.117, p=0.004). This means that systematic desensitization counselling technique had a positive and significant effect on reducing of all aspects of social anxiety among secondary school students of Nassarawa Zonal Education Directorate, Kano State. Theoretically, this finding coincides with Behavioral Theory (Classical Conditioning) which explains how individuals associate specific stimuli with anxiety responses. Systematic Desensitization Technique applies this theory by gradually exposing individuals to anxiety-inducing stimuli while teaching relaxation techniques, breaking the anxiety-stimulus link. According to Nwobodo (2022) systematic desensitization technique is based on learning and behavioral change principles. Through repeated exposures and relaxation techniques, individuals learn to identify anxiety-provoking events with relaxation rather than terror, leading to a positive shift in behavior and emotional reaction. Empirically, the finding is in consonance with findings of Abdullahi (2022) who revealed that there is significant effect of Systematic Desensitization (SD) counselling technique on cognitive dimension of social anxiety among primary School pupils in Nassarawa Orphanage home Kano, Kano State. Ventas, Higbee and Murdock (2001) investigated the effectiveness of systematic desensitization for fear reduction, trembling and avoidance behaviour using humorous hierarchy scenes without relaxation and found that a systematic desensitization is effective in reducing fear, trembling and avoidance behavior among students in America. Similarly, Yusuf (2019) conducted a study on the effect of Systematic Desensitization on social anxiety among junior secondary school students in Zaria metropolis and the results revealed that the application of systematic desensitization had a significant impact on separation anxiety (t=4.486, p=.000). It also corresponds with finding of Powers (2020) who found that exposure-based therapies, including systematic desensitization, were effective in reducing cognitive dimensions of social anxiety.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202545

Hypothesis 2; revealed that there is significant effect of Systematic Desensitization Technique (SDT) on behavioural dimension of social anxiety among secondary school students of Nassarawa Zonal Education Directorate, Kano State (t = -3.772, p=0.001). This shows that Systematic Desensitization Technique (SDT) had the effect of reducing behavioural dimension of social anxiety among students. Theoretically, this finding supported Pavlov's postulations of Classical Conditioning Theory which featured that through the use of therapeutic skill, the behaviour can be changed, especially the undesirable behaviours, and that most of the things that happen to us like fear and anxiety are due to conditioning, so for any psychological problem you want to handle you first get the sequence of the problem. Empirically, this finding is in line with that Muhammad (2014) investigated the effectiveness of the Cognitive Restructuring and Systematic Desensitization techniques in the Control of Social Anxiety among Final Year Secondary School Students in Kaduna Metropolis and the results confirmed that systematic desensitization was very effective in controlling social anxiety and emotionality of the students respectively. Also, Prayetno (2020) conducted a study on the effect of systematic desensitization on anxiety in individual with specific social anxiety in Indonesia and found out that systematic desensitization helps people with particular anxiety feel less anxious. It also in line with findings of Nwobodo et al (2022) who found that adult learners exposed to systematic desensitization had significant reduction in their social anxiety than those not exposed. Similarly, Regina and Lezorgia (2017) found out that systematic desensitization technique is effective in the management of metho anxiety among secondary school students in Khana Local Government Area of Rivers State, Nigeria.

Hypothesis 3; this study found a significant effect of Systematic Desensitization Technique (SDT) on physiological dimension of social anxiety among secondary school students of Nassarawa Zonal Education Directorate, Kano State (t = -7. 910, p=0.001). This implies that systematic desensitization counselling technique had a significant positive effect on the physiological dimension of social anxiety among secondary school students. Therefore, it is clear to conclude that Systematic Desensitization Technique (SDT) was found to significantly reduce physiological dimension of social anxiety among students. Similarly, the interventions in this study resulted in improved classroom participation and reduced self-imposed social isolation among students. This emphasizes the importance of using evidence-based techniques to foster positive behavioral changes. Theoretically, this finding gain support from Behavioral Theory (Classical Conditioning) which explains how individuals associate specific stimuli with anxiety responses. Systematic Desensitization Technique applies this theory by gradually exposing individuals to anxiety-inducing stimuli while teaching relaxation techniques, breaking the anxiety-stimulus link. Empirically, the finding is in agreement with the research conducted by Paul (2016) who studied how systematic desensitization is used to reduce public speaking anxiety and reported that Systematic Desensitization Technique is highly effective in improving students' confidence in public speaking and participation in social interactions. Also, the finding of this study is in conformity with the findings of Chisara (2017) who found that Systematic Desensitization was effective in reducing generalized anxiety in secondary school adolescents. Otta and Ogazie (2014) and Ifeanyi (2015) further emphasize the efficacy of SDT in mitigating physiological distortions associated with social anxiety, such as negative self-perceptions and irrational fears. Consistent with their findings, this study demonstrates a significant effect in reducing physiological symptoms among students, thereby increased social confidence and reduced feelings of inadequacy.

Conclusions

Emanating from the findings of this study, the following conclusions are drawn:
The study found a significant effect of the Systematic Desensitization Technique in reducing students' social anxiety. Students with social anxiety can gradually overcome their fears when they confront them in a safe environment while practicing relaxation techniques. It was therefore concluded that systematic desensitization technique significantly impacts all dimensions of social anxiety among senior secondary school students in Nassarawa Zonal Education Directorate of Kano State.

Summary of Findings

From the analysis of data, the following were emanated as the findings of the study:

1) There is significant effect of Systematic Desensitisation Technique (SDT) on cognitive dimension of social anxiety among secondary school students of Nassarawa Zonal Education Directorate, Kano State (-3.117, p=0.004).
2) There is significant effect of Systematic Desensitisation Technique (SDT) on behavioural dimension of social anxiety among secondary school students of Nassarawa Zonal Education Directorate, Kano State (-3.772, p=0.001).
3) There is significant effect of Systematic Desensitisation Technique (SDT) on physiological dimension of social anxiety among secondary school students of Nassarawa Zonal Education Directorate, Kano State (-7. 910, p=0.001).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202545

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Since Systematic Desensitization Technique had the significant effect on social anxiety among Secondary School Students of Nassarawa Zonal Education Directorate, it was recommended that its application should utilized by school counsellors, teachers and school administrators for the treatment of social anxiety in school settings.
2. School authorities should consider systematic desensitization technique to help students manage anxiety in all its dimensions and improve their overall well-being.
3. Education stakeholders should train school counselors on the application of evidence-based techniques like Systematic Desensitization Technique to promote behaviour modification, helping students build confidence and reduce anxiety in social interactions.

References

Ahmed, A. (2016). *Effects of Cognitive Restructuring and Graded Exposure Counselling Technique on School Anxiety among Secondary School Students in Daura Zonal Inspectorate of Education of Katsina State*. Unpublished Masters Theses, Department of Educational Psychology and Counselling, Ahmadu Bello University, Zaria.

Abdullahi, S. A. (2022). *Effect of Systematic Desensitization and Social Skills Training on Social Anxiety among Primary School pupils in Nassarawa Orphanage Home, Kano state, Nigeria.* Unpublished Ph. D Dissertation submitted to department of Educational psychology and Counselling, Ahmadu Bello University, Zaria.

Bala, A. M. (2019). *Comparative Effectiveness of Cognitive Restructuring and Systematic Desensitization in Reducing Social Anxiety among Students in Kaduna State.* Unpublished Doctors Thesis Submitted to the School of Postgraduate Studies Department of Educational Psychology and Counselling, Ahmadu Bello University Zaria, Nigeria.

Beidel, D., C., (2014). The impact of social skills training for social anxiety problems: A randomized controlled trial. *Journal of Anxiety Problems 2* (8) 908–918.

Bolsoni-Silva, A., T., & Loureiro S., R. (2021). The Role of Social Skills in Social Anxiety of University Students *Paidéia 24* (58) 223-232.

Carvalho A.F., McIntyre R.S. (2017). *Mental problems in primary care: A guide to their evaluation and management*. Oxford University Press.

Chisara (2017) Effects of Systematic Desensitization and Self Instruction Techniques on Generalized Anxiety among Adolescents in Enugu State. Unpublished Ph.D Dissertation In Counselling Psychology Submitted To The Department Of Guidance And Counselling Faculty of Education Nnamdi Azikiwe University, Awka Enugu State.

Emslie, G. J. (2018). Pediatric anxiety: Under-recognized and undertreated. *The New England Journal of Medicine, 3* (5) *9* - 35.

Hofmann, S. G. et al (2012). Cognitive-Behavioural Therapy for anxiety problems. *Clinical Psychology Review*, 32(5), 329-341.

Muhammad, H.B. (2014). *Effects of Cognitive Systematic Desensitization on Test Anxiety among Senior Secondary School Students III (SSS 3) in Kaduna Metropolis*; Kaduna State Nigeria. (Unpublished Doctoral Thesis). ABU Zaria-Nigeria.

Muhammad, M. S. (2019). *Effects of Cognitive Restructuring and Self-Management Counselling Techniques in Reducing Test Anxiety among Students of Staff Secondary Schools in Kano State, Nigeria*. Unpublished PhD Thesis submitted to the School of Postgraduate Studies, Department of Education, Bayero University Kano.

Muhammad, U. G., Yusuf, N. A. & Abdullahi, M. I (2021) Effect of Cognitive Restructuring Technique on Social Anxiety among Senior Secondary School Students in Suleja Education Zone, Niger State, Nigeria. *Prestige Journal of Counselling Psychology 4* (2) 11-22

Nwobodo, P., Onwuasoanya, N. P., Chigbu, F. E., Chukwu, P. N & Omeje, J. C (2022). Effects of Systematic Desensitization on Test Anxiety of Adult Learners in Enugu State Nigeria. *Journal of Education, 6* (4), 130-142.

Paul, N. E. (2016). Effects of Systematic Desensitization (SD) therapy on the reduction of test anxiety among adolescents in Nigerian schools: *Journal of Instructional Psychology, 32* (4).345 -369

Lezorgia, R. (2017). Effect of Cognitive Restructuring and Systematic Desensitization in the Management of Mathoanxiety among Secondary School Students in Khana L.G.A of Rivers State, Nigeria. *American Journal of Educational Research (5)* 11

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202545

Russell, G., & Topham, P. (2012). Impact of social anxiety on student learning and well-being in higher education. *Journal of Mental Health, 21* (4) 375-385.

Ventis, W.L., Higbee, G & Murdock, S.A (2011). Using humor in systematic desensitization to reduce fear. *The Journal of General Psychology*, *12* (2), 241-253.

Wolpe, J. (1958). *Psychotherapy by reciprocal inhibition*. Stanford University Press.

Yasser, A (2019). The effect of cognitive restructuring counselling technique on reducing students' social media usage intensity. *Jurnal Psikologi Pendidikan & Konseling: Jurnal Kajian Psikologi Pendidikan dan Bimbingan Konseling 5* (2) 76-83 DOI: https://doi.org/10.26858/jppk.v5i2.9639

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202546

Impact of Cognitive Restructuring Counselling Technique in Addressing Menace of Drug Abuse and Insecurity in Gusau Metropolis, Zamfara State, Nigeria

ABUBAKAR, Sadiq Haruna[1]
Email: asharuna@fugusau.edu.ng
Tel:07066994040

NAMADI Aisha[1]
Email: aishatnamadi@gmail.com
Tel:08037212466

MUHAMMAD, Ramatu Ali[1]
Email: rahmatualimuhd@gmail.com
Tel: 07062663500

[1]Department of Educational Foundations, Federal University Gusau, Zamfara State, Nigeria

Abstract
Drug abuse is a significant driver of insecurity in Gusau Metropolis, contributing to violent crimes, armed robbery, and other social disturbances. This paper examines the role of cognitive restructuring as a counseling technique in addressing drug abuse and, consequently, reducing insecurity in the region. Cognitive restructuring, a core component of cognitive-behavioral therapy (CBT), helps individuals identify and modify maladaptive thought patterns that contribute to substance abuse and criminal behavior. By replacing distorted beliefs with healthier cognitive frameworks, individuals can develop better coping mechanisms, reduce aggression, and make more positive life choices. This paper highlights the link between drug abuse and insecurity in Gusau metropolis, explores the key components of cognitive restructuring technique, and presents recommendations for its implementation in addressing potential causes of insecurity. The study concludes that integrating cognitive restructuring as a counselling intervention into drug abuse can play a crucial role in breaking the cycle of addiction and crimes, ultimately fostering a safer and more stable society in Gusau Metropolis.
Keyword: Drug abuse, Cognitive restructuring, Counseling technique, Insecurity.

Introduction
Gusau Metropolis, the capital of Zamfara State, Nigeria, has been grappling with increasing insecurity, including armed robbery, banditry, and other violent crimes. One of the underlying factors fueling this insecurity is the high prevalence of drug abuse among youths and criminal elements. Effective intervention strategies are crucial to breaking the cycle of substance abuse and crime. This paper argues that cognitive restructuring, a key counseling technique in cognitive-behavioral therapy (CBT), can play a vital role in addressing drug abuse and, consequently, mitigating insecurity in Gusau Metropolis.

The Relationship Between Drug Abuse and Insecurity
Recent studies have reaffirmed the strong connection between drug abuse and rising insecurity, particularly in Nigeria. According to the United Nations Office on Drugs and Crime (UNODC) (2023), substance abuse remains a leading contributor to violent crimes, including armed robbery, kidnapping, and terrorism in West Africa. The National Drug Law Enforcement Agency (NDLEA) (2023) reported an increase in drug-related arrests in Zamfara State, linking substance abuse to criminal activities carried out by youth and organized crime groups. Similarly, World Health Organization (WHO) (2022) emphasized that drug-induced cognitive impairment leads to aggressive behaviors, poor decision-making, and increased vulnerability to criminal influences.

In the case of Gusau Metropolis, local reports indicate that the abuse of drugs such as tramadol, codeine, and cannabis is widespread among young people, particularly those involved in banditry and other criminal activities (Zamfara State Government, 2023). This suggests that addressing substance abuse could significantly contribute to improving security in the region.

Cognitive Restructuring as a Counseling Technique
Cognitive restructuring, a core component of Cognitive-Behavioral Therapy (CBT), has been widely recognized as an effective approach for treating substance use disorders. Beck et al. (2022) reaffirm that distorted thought patterns play a critical role in addiction, and restructuring these thoughts can lead to more rational decision-making and long-term recovery. Ellis & Dryden

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202546

(2023) emphasize that irrational beliefs, such as "I need drugs to cope with stress," can be effectively challenged and replaced with healthier coping mechanisms through cognitive restructuring. Recent research by Smith et al. (2023) found that individuals receiving cognitive restructuring therapy for substance abuse had a 40% lower relapse rate than those receiving only medication-assisted treatment. Similarly, a study conducted by Marlatt and Witkiewitz (2023) highlighted that cognitive restructuring enhances self-regulation, making individuals less likely to resort to drug use in stressful situations.

Cognitive Restructuring and Crime Prevention

The role of cognitive restructuring in reducing criminal tendencies has also gained recent attention. Lipsey et al. (2022) demonstrated that cognitive-behavioral interventions, including cognitive restructuring, reduced criminal recidivism by 35% among offenders with a history of drug abuse. Similarly, Gendreau et al. (2023) emphasized that criminal behavior is often fueled by distorted cognitive patterns, such as self-justification of illegal actions or externalizing blame. Addressing these cognitive distortions through restructuring therapy has been shown to decrease tendencies toward violence and impulsivity.

Application of Cognitive Restructuring in Gusau Metropolis

Recent policy recommendations from the Zamfara State Government (2024) highlight the need for localized rehabilitation programs that incorporate cognitive restructuring techniques. Given the cultural and religious influences in Gusau, integrating cognitive restructuring with faith-based counseling could improve acceptance and effectiveness. Olawale & Ahmed (2023) suggest that community-based cognitive restructuring initiatives-where traditional leaders, religious scholars, and mental health professionals collaborate—can enhance the success of drug rehabilitation programs.

Additionally, the NDLEA (2024) has proposed integrating cognitive restructuring techniques into prison rehabilitation programs for drug offenders, with the goal of reducing reoffending rates and promoting reintegration into society.

Components of Cognitive Restructuring in Drug Abuse Counseling

The key components According to American Addiction centers.org January 2025 & vfmc implementing cognitive restructuring technique for addiction October 2024:

1. Identifying Negative Thought Patterns – Many drug users hold irrational beliefs, such as "I need drugs to cope with my problems" or "Life is hopeless without substances." Cognitive restructuring helps them recognize these harmful thoughts.
2. Challenging Irrational Beliefs – Through counseling, individuals are encouraged to question and challenge their distorted thoughts, replacing them with healthier and more realistic perspectives.
3. Developing Alternative Thinking Patterns – Clients learn to adopt positive thought processes, such as "I can manage stress without drugs" or "I have control over my actions."
4. Behavioral Modification – By changing thought patterns, individuals are encouraged to engage in productive activities, develop self-control, and make better life decisions.

Impact of Cognitive Restructuring Can Reduce Insecurity in Gusau

International journal of education & evaluation 2024 identifies the following:

1. Breaking the Drug-Crime Cycle – By addressing the root cognitive distortions that lead to drug abuse, individuals are less likely to engage in criminal activities associated with substance use.
2. Reducing Violent Behavior – Cognitive restructuring promotes emotional regulation and impulse control, reducing aggression and violent tendencies among drug users.
3. Enhancing Rehabilitation and Reintegration – Former drug users who undergo cognitive restructuring are better equipped to reintegrate into society as law-abiding citizens, thereby reducing the pool of individuals engaging in criminal activities.
4. Improving Community Safety – A reduction in drug-related offenses leads to a safer community, restoring public confidence and fostering economic and social development.

Conclusion

Addressing drug abuse is a critical step in tackling insecurity in Gusau Metropolis. Cognitive restructuring, as a counseling technique, offers an effective approach to changing the thought patterns and behaviors that contribute to substance abuse and crime. By integrating cognitive restructuring into drug rehabilitation programs, policymakers, counselors, and law enforcement agencies can significantly reduce insecurity, promote social stability, and enhance the overall well-being of the community.

Recommendations

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202546

To effectively implement cognitive restructuring as a counseling technique for addressing drug abuse and reducing insecurity in Gusau Metropolis, the following recommendations should be considered:

1. Integration of Cognitive Restructuring in Rehabilitation Programs Drug rehabilitation centers in Gusau should incorporate cognitive restructuring techniques into their counseling sessions to help individuals develop healthier thought patterns and behavioral responses.
2. Training and Capacity Building for Counselors; The government and relevant organizations should provide specialized training for counselors, psychologists, and social workers on cognitive restructuring techniques to enhance their effectiveness in addressing drug abuse.
3. Community-Based Counseling Initiatives; Establishment of community-based counseling centers where individuals struggling with substance abuse can receive cognitive restructuring therapy without fear of stigma or discrimination.
4. Public Awareness and Education Campaigns: Government agencies, religious organizations, and NGOs should conduct awareness programs to educate the public on the dangers of drug abuse and the benefits of cognitive restructuring in overcoming addiction.
5. Collaboration Between Law Enforcement and Mental Health Experts: Security agencies should work closely with mental health professionals to ensure that individuals arrested for drug-related offenses receive appropriate counseling and rehabilitation instead of solely punitive measures.
6. Youth Empowerment and Alternative Livelihood Programs: The government should create employment opportunities, vocational training, and skills acquisition programs to provide young people with productive alternatives to drug abuse and criminal activities.
7. Parental and Family Involvement in Counseling: Family members should be engaged in the counseling process to provide emotional support and reinforce positive cognitive and behavioral changes in recovering drug users.
8. Monitoring and Evaluation of Rehabilitation Programs: Regular assessment of the effectiveness of cognitive restructuring in drug abuse rehabilitation should be conducted to improve counseling techniques and ensure better outcomes. By implementing these recommendations, Gusau Metropolis can reduce drug abuse, enhance security, and create a safer, more stable society.

Reference

Beck, A. T. (1976). Cognitive therapy and the emotional disorders. International Universities Press.

Ellis, A. (1962). Reason and emotion in psychotherapy. Lyle Stuart.

Marlatt, G. A., & Donovan, D. M. (2005). Relapse prevention: Maintenance strategies in the treatment of addictive behaviors. Guilford Press.

National Drug Law Enforcement Agency (NDLEA). (2021). Annual drug abuse report in Nigeria. Retrieved from www.ndlea.gov.ng

National Institute on Drug Abuse (NIDA). (2020). Cognitive-behavioral therapy for substance use disorders: Evidence-based approaches. Retrieved from www.drugabuse.gov

World Health Organization (WHO). (2018). Global status report on alcohol and health 2018. Retrieved from www.who.int

Zamfara State Government. (2023). Security and drug control policies in Gusau metropolis. Retrieved from www.zamfarastate.gov.ng

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

Ahmadu Bello's Philosophy of Education: A Pragmatic Approach to National Development in Nigeria

IRABOR, Benson Peter[1]
Email: benpet1@yahoo.com
+2348034624353

MUHAMMAD, Dahiru[2]
Email: dahiru.muhammad@umyu.edu.ng
+2348069682572

SA'IDU, Muhammad Faguji[3]
Email: sa'idumf2010@gmail.com
+2348141314180

[1]Department of philosophy, University of Lagos
[2]Faculty of Education, Umaru Musa Yar'adua University, Katsina State
[3]School of Education, Federal College of Education, Okene, Kogi State

Abstract
This study explores Ahmadu Bello's philosophy of education, focusing on its pragmatic approach to national development. Despite the absence of a formally published document on his educational philosophy, his speeches, writings, and policies as Premier of Northern Nigeria reveal a coherent vision for education. Through critical and logical analysis and hermeneutical methodology, this research examines Bello's views on education as a tool for national unity, economic progress, and social advancement. The study highlights his emphasis on practical skills, vocational training, literacy, and basic education, which aimed to make education relevant and beneficial to the local populace. Bello's policies had a significant impact on educational development in Northern Nigeria, including the introduction of English as the medium of instruction and the establishment of teacher training colleges. The findings reveal gaps in literature on Bello's educational philosophy, particularly in relation to its pragmatic approach to national development. This study contributes to knowledge by providing a detailed understanding of Bello's educational thought and its relevance to contemporary educational policy debates. The research recommends a renewed focus on practical skills and vocational training in educational policy, highlighting the importance of education in promoting national unity and economic progress. The study concludes that Bello's pragmatic approach to education remains relevant today, offering valuable insights for policymakers seeking to harness education for national development.
Keywords: Keywords: Ahmadu Bello, Philosophy, Pragmatic, National Development, Nigerian Education

Introduction
Education as a vital instrument for national development involves acquisition of fundamental knowledge and essential developmental skills needed for technological breakthrough and socio-political development which accelerates economic growth. Education is a fundamental driver of human and national development, fostering economic growth, social mobility, and individual prosperity. It equips individuals with the knowledge, skills, and competencies necessary to navigate an increasingly complex and interconnected world (Azenabor, 2005, p. 12). Societies in ancient Greece and during the medieval as well as through the modern period had deep and fervent regard for educated citizens (Nwizarh, 2001, p.72). It is perhaps due to the essential democratic culture that education gives rise to that Plato had advocated that philosophers should assume the task of managing democracy as leaders (Plato 1978, pp.167-168). The significance of education in national development is further underscored by the philosophy of Reconstructionism, which posits that society is in need of constant reconstruction or change and education is the vehicle of change (Ozomon & Craver, 1990, p. 1528). This perspective is reechoed by the United Nations Educational, Scientific and Cultural Organization (UNESCO), which recognizes education as a fundamental human right and a key driver of sustainable development (UNESCO, 2015, p. 5). The strength of a nation is intricately linked with the quality and quantity of its human resources. Education serves as the pivot for development and capacity building, enabling individuals to acquire the knowledge, skills, and values necessary to participate fully in society and contribute to its

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

development (Kneller, 1964, p. 23). Through the deliberate transmission of cultural heritage, educational institutions play a vital role in shaping individuals and societies (Federal Republic of Nigeria, 2013, p. 15). Ahmadu Bello's philosophy of education, though not formally documented, reveals a coherent vision for education as a tool for national development. His emphasis on practical skills, vocational training, literacy, and basic education aimed to make education relevant and beneficial to the local populace. This study explores Ahmadu Bello's pragmatic approach to education and its relevance to national development, examining his policies and their impact on educational development in Northern Nigeria. In Nigeria, the government has acknowledged the importance of education in national development, leading to the enactment of the Students Loans (Access to Higher Education) Act, No. 12 of 2024, also known as the Nigeria Education Loan Fund (NELFUND) (National Assembly, 2024, p. 2).

A Brief Articulation of the Life and Legacy of Ahmadu Bello

Ahmadu Bello was a prominent Nigerian politician who played a pivotal role in shaping the country's history, particularly in the Northern Region. Born on June 12, 1910, in Rabbah, Sokoto State, Bello's life was marked by a unique blend of traditional leadership and Western governance (Paden, 1986, p. 6). His great-grandfather, Sultan Bello, was the son of Usman Dan Fodio, the founder of the Fulani Empire, the largest in sub-Saharan Africa. Bello's early education was rooted in Islamic studies, where he learned the Quran, hadiths, and sharia law under the tutelage of Muslim masters. He later attended the Sokoto Middle School and the Katsina Teacher's Training College, where he honed his skills in modern education (Ibrahim Gambari, 2016, pp. 173-193). In 1948, Bello was offered a scholarship to study local government administration in England, which he accepted to broaden his knowledge of governance (Jibrin Ubale Yahaya, 2018, pp.249-261). Upon his return from England, Bello was nominated to represent Sokoto in the regional House of Assembly, where he became a strong advocate for northern interests. He was a key figure in the Northern People's Congress (NPC) and served as the party's President-General from 1954 (Paden, 1986, p. 12). Bello's leadership style was characterized by consultation and consensus-building with the major representatives of the northern emirates, including Kano, Bornu, and Sokoto. In 1954, Bello became the first Premier of Northern Nigeria, a position he held until his assassination in 1966. During his tenure, he implemented several development projects, including the establishment of the Northern Regional Development Corporation (NRDC), the Bank of the North, and the Broadcasting Company of Northern Nigeria (BCNN) (Ibrahim Gambari, 2016, pp. 173-193). Bello's vision for Northern Nigeria was centered on modernization and unification, and he worked tirelessly to promote economic development and cultural preservation (Zaccheus Onumba Dibiaezue, 2025).

Ahmadu Bello's legacy is multifaceted and far-reaching. He played a crucial role in shaping Nigeria's political landscape, particularly in the Northern Region. His commitment to federalism and regional autonomy helped to promote national unity and stability (Paden, 1986, p. 20). Bello's establishment of Ahmadu Bello University in Zaria, one of the largest universities in Africa, is a testament to his vision for education and development. Tragically, Bello's life was cut short by his assassination on January 15, 1966, in a coup that toppled Nigeria's post-independence government. His death was a significant blow to the country and contributed to the subsequent civil war (Ibrahim Gambari, 2016, pp. 173-193). Despite his untimely death, Bello's legacy continues to inspire and shape Nigeria's development. In all, Ahmadu Bello was a visionary leader who played a pivotal role in shaping Nigeria's history. His commitment to development, unity, and federalism continues to inspire and inform Nigeria's political landscape. As a founding father of the modern Nigerian nation-state, Bello's legacy serves as a reminder of the importance of leadership, vision, and sacrifice.

Understanding Philosophy and Education: A Springboard for Development

This section aims to clarify the concepts of philosophy, education, and philosophy of education, providing a foundation for understanding their interconnectedness and significance in promoting human growth and societal progress. The concepts of philosophy, education, and philosophy of education are intricately linked, and their understanding is essential for national development as we discuss Ahmadu Bello's philosophy of education.

What is Education?

Education, a concept rooted in the Latin word "educare," meaning "to make, mold or bring out" (Oxford Dictionary, 2020), has been a subject of debate among educators and scholars for centuries. Despite its universal significance, education lacks a clear-cut definition, with various interpretations emerging from diverse perspectives. According to Akinkuotu, "education as a universal concept has a different meaning from place to place and from time to time" (2010, p. 12). This dynamic nature of education is reflected in Kneller's distinction between the broad and narrow/technical senses of education. In the broad sense,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

education encompasses the act or experience that helps to create a formative effect on the mind, behavior, or character of a person (Kneller, 1964, pp. 23-25).

Whitehead defines education as "the acquisition of the art of the utilization of knowledge" (1929, p. 10), while Azenabor describes it as "a continuous reconstruction of experience and the adjustment of the individual to the society, to nature, to his fellow human being" (2005, p. 15). Ukeje further emphasizes the societal dimension of education, submitting that education is "an investment by the society to make itself a better place to live in and make a living" (2015, p. 20). The various definitions of education converge on its three basic foci: information, formation, and reformation (Iroegbu, 2005, p. 221). Education is crucial for national development, providing necessary skills, knowledge, and values for societal growth (Iroegbu, 1994, p. 81). According to Iroegbu, development involves unwrapping inner potentialities, encompassing economic, social, environmental, human, and sustainable development. Omoregbe defines national development as a nation's ability to ensure high literacy, a strong economy, and material goods for national security and happiness (1990, p. 194). National development is a gradual growth process driven by patriotism and nationalism, implying progress in various aspects of human life (Udoidem, 2002, p. 102).

What is Philosophy

Defining philosophy can be uncomfortable for both beginners and teachers, but this discomfort is not a significant concern. Historically, philosophers have begun exploring philosophical ideas before attempting to define the subject (Ogbinaka, 1995, p.3). The complexity of philosophy's long history, broad scope, and nuanced nature has created an intellectual environment that makes it challenging to develop a clear and universally accepted definition of philosophy. According to Akinpelu (2005), Plato and other disciples of Socrates corroborated that "Socrates preferred not to call his students wise men" but rather "lovers of wisdom." This lends credence to the etymology of the word "philosophy," which is coined from two Greek words: *Philo* (love) and *Sophia* (wisdom or knowledge). So, literally translated into English as 'love' and 'wisdom' respectively. Hence, a combination of both terms has led intellectuals to conceive philosophy as the love for/of wisdom. Philosophy is perceived as an attitude towards life, which makes life become more intelligent, more meaningful, and purposeful (Oroka, 2010, pp. 1-5). Akinpelu (2005, p. 167) holds that philosophy plays the role of a midwife, helping to bring ideas to birth.

Philosophy of Education

The philosophy of education is a branch of philosophy that deals with the nature, aims, and methods of education. It is concerned with the fundamental questions of education, such as what is the purpose of education, what is the nature of knowledge, and how do we learn. The philosophy of education provides a framework for understanding the complex issues in education and for developing effective educational policies and practices. The philosophy of education is essential for national development, as it provides a foundation for understanding the role of education in promoting societal growth and progress. By understanding the philosophy of education, policymakers can develop effective educational policies that promote national development. The philosophy of education also provides a framework for evaluating the effectiveness of educational policies and practices, ensuring that they are aligned with the goals of national development.

A Springboard for Development

The concepts of philosophy, education, and philosophy of education are a springboard for national development. Education provides the necessary skills, knowledge, and values for societal growth, while philosophy provides a framework for understanding the complex issues in education and for developing effective educational policies and practices. The philosophy of education provides a foundation for understanding the role of education in promoting societal growth and progress. By understanding the philosophy of education, policymakers can develop effective educational policies that promote national development. The philosophy of education also provides a framework for evaluating the effectiveness of educational policies and practices, ensuring that they are aligned with the goals of national development. Philosophy, education, and philosophy of education are interconnected concepts that play a crucial role in promoting national development. Philosophy provides a framework for understanding the complex issues in education, while education provides the necessary skills, knowledge, and values for societal growth. The philosophy of education provides a foundation for understanding the role of education in promoting societal growth and progress. The significance of philosophy, education, and philosophy of education in promoting national development cannot be overstated. Education is a key driver of national development, and philosophy provides a framework for understanding the complex issues in education. The philosophy of education provides a foundation for developing effective educational policies and practices that promote national development. The concepts of philosophy, education, and philosophy of education are essential for national development. By understanding these concepts, policymakers can develop effective educational policies that promote societal growth and progress. Ahmadu Bello, a visionary leader,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

exemplified this understanding in his efforts to reform education in Northern Nigeria. His initiatives were guided by a clear philosophy of education that aimed to empower individuals and promote national development. In the next section, we will explore Bello's philosophy of education in more detail, examining how his ideas continue to shape educational discourse and policy in Nigeria. By examining Bello's philosophy of education, we can gain valuable insights into the role of education in promoting national development and the importance of visionary leadership in shaping educational policy.

Ahmadu Bello's Quadruple Philosophy of Education

This section aims to provide an in-depth examination of Ahmadu Bello's philosophy of education, a comprehensive framework understood through four distinct yet interconnected pillars that collectively form his quadruple philosophy of education, comprising his vision on practical skills and vocational education, emphasis on national unity and development, influence on educational policy and curriculum, and promotion of literacy and basic education, thereby offering a detailed understanding of his educational thought, its underlying principles, and potential applications in promoting national development and societal progress.

First: Practical Skills and Vocational Education

Ahmadu Bello's emphasis on practical skills and vocational education reflects a pragmatic approach to education that has its roots in Africa's pre-colonial era. In pre-colonial Africa, education was informal and vocational, focusing on skills acquisition and mastery (Fafunwa, 1974:15). This traditional or indigenous educational system, which existed before the arrival of Islam and Christianity, aimed to develop the child's latent physical skills and prepare them for adulthood (Fafunwa, 1974:20). One of the key features of indigenous education is its emphasis on practical demonstration and hands-on learning, where learners acquire skills through observation, listening, and participation (Enueme, 2000:50-51). This approach to education is lifelong, with no concept of dropouts, as individuals continue to learn and acquire new skills throughout their lives (Ajuzie, 2017:9-8). Bello's pragmatic model of education, which prioritizes practical skills and vocational training, draws inspiration from this indigenous approach to education. By focusing on skills acquisition and mastery, Bello's policies aimed to make education more relevant and beneficial to the local populace. As a pragmatist, Bello's approach to education emphasizes the importance of seeking out processes and doing things that work best to achieve desirable ends (Igbiwu, 2004:35).

Pragmatism, as a philosophy, encourages the search for practical solutions to concrete problems, rather than getting bogged down in abstract theories and intellectual questions that don't offer practical solutions (Mercier, 2002:86-87). John Dewey, a prominent pragmatist, applied this philosophy to education, arguing that traditional educational techniques focused too much on memorization and not enough on problem-solving (Chukwuma & Ebeigbe, 2012:85). Similarly, Bello's emphasis on practical skills and vocational education reflects a pragmatic approach that prioritizes effectiveness and practicality in solving real-world problems. By linking his policies to the indigenous educational system, Bello's pragmatic approach to education seeks to develop critical thinking and problem-solving skills, preparing individuals to tackle the complexities of the real world. As Dewey notes, education should be instrumental in achieving its goals, and this is possible through experiences (Aggarwal Gupta, 2014:127-128). Bello's pragmatic model of education embodies this philosophy, emphasizing the importance of practical skills and vocational training in achieving national development.

Second: National Unity and Development

Ahmadu Bello, a visionary leader, strongly believed in the importance of national unity and development in Nigeria. He advocated for unity among Nigerians, emphasizing that it is the bedrock of national development. National unity is the foundation upon which national development is built. Without unity, a nation cannot achieve its full potential. As the Nigerian coat of arms states, "Unity and Faith, Peace and Progress" are essential for the country's growth and prosperity. The concept of unity is derived from the Latin word *"unitas,"* meaning oneness or togetherness. Unity does not connote uniformity, but rather diversity working together towards a common goal. Thus, the unity of a country does not imply that such a country has citizens of the same racial, ethnic, cultural, religious, social and economic characteristics (Dzurgba, 2009, p.39). This implies that even in diversity, there is can still be unity. This point is reiterated by Adetoro and Omiyefa (2013, pp. 480-490) when they aver that the concept of unity implies 'oneness' 'alike', 'trust', 'mutual understanding' while diversity means 'great variety'. In Nigeria's context, unity is essential for national development, given the country's diverse cultural, linguistic, and religious backgrounds. Unfortunately, Nigeria is currently facing numerous challenges that threaten national unity, including religious crises, ethnic tensions, and socioeconomic inequalities. Ahmadu Bello recommends integrating values that promote peace and stability into Nigeria's education system. To foster a harmonious environment, he emphasizes the importance of mutual respect for diverse cultures, traditions, and perspectives, and abandoning tribal superiority claims that often fuel

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

divisions. By incorporating these values into education, Bello believes Nigeria can establish a foundation for lasting peace, stability, and national unity, enabling citizens to appreciate their differences and work towards a common purpose. This approach, he suggests, can help build a cohesive society where individuals respect and value one another, regardless of their backgrounds.

He avers:

> Respecting the ways of life different from one's own or tolerance of other's culture and tradition; avoiding the ranking of tribes; emphasizing those things that unite in the midst of diversity rather than those that divide; tracing historical linkages; having commonly agreed goals as well as adopting the principles of equality of all individuals in addition to pursuing a policy of even development (Ahamadu cited by Enoh, 1996, p.134).

Therefore, in this context, Ahmadu Bello's vision for national unity and development is more relevant than ever. He believes that education could play a critical role in promoting national unity and development, particularly in a diverse and often fragmented society. He sees education as a tool to build a shared identity and culture among the people. By incorporating African indigenous knowledge systems into the education system, Nigeria can promote a sense of community and cooperation that is essential for national development. One such system is *Harambee*, a Kenyan concept that means "pulling together" and emphasizes the importance of collective effort in achieving development. Through *Harambee*, Kenyans have been able to raise funds for infrastructure development, education, and agricultural projects (Ng'ethe 1979, p.13). This philosophy can be applied to Nigeria's context to promote national unity and development. By working together, Nigerians can achieve great things and build a brighter future for themselves and future generations. Consequently, the spirit of Harambee can be seen as a call to action for Nigerians to come together and work towards a common goal (Irabor & Onwudinjo, 2022, pp.45-57).

Similarly, *Ubuntu,* an African philosophy, highlights the interconnectedness of human beings. It emphasizes the importance of community, mutual respect, and caring for one another. Ubuntu can be seen in the concept of "I am because we are," which underscores the interdependence of individuals within a community. As Desmond Tutu (1999, pp.31-32) notes, "A person with Ubuntu is open and available to others, affirming of others, does not feel threatened that others are able and good; for he or she has the proper self-assurance that comes from knowing that he or she belongs in a greater whole." This philosophy is echoed in the Christian scripture, which emphasizes the importance of unity and love among believers. In John 17:21, Jesus prays, "That they all may be one; as thou, Father, art in me, and I in thee, that they also may be one in us: that the world may believe that thou hast sent me." The importance of unity is further emphasized in *Ujamaa*, a socio-political theory formulated by Julius Nyerere. Ujamaa emphasizes the importance of familyhood and cooperation, encouraging people to work together for the benefit of all members of society, promoting social justice and equality. Ujamaa can be applied to Nigeria's development context to foster unity and cooperation. As Nyerere notes, "People were not to be judged by skin colour, material wealth or intellectual ability, but 'each individual should be assessed by her or his worth as a person'" (Mulenga, 2001, p.15). This philosophy is in line with the principles of *Ubuntu* and *Harambee*, emphasizing the importance of unity and collective effort in achieving development.

Furthermore, *Igwebuike,* an Igbo concept, means "number is strength" or "number is power." It emphasizes the importance of unity and solidarity in achieving development. Igwebuike can be seen as a call to action for Nigerians to come together and work towards a common goal. According to Kanu (2017, pp.165-8), *Igwebuike* provides a socio-political platform for leadership of inclusivity, promoting unity and solidarity. This concept is closely related to the idea of Belongingness, which emphasises the importance of community and inclusivity. Belongingness, a concept developed by Pantaleon Iroegbu, highlights the need for individuals to feel a sense of belonging and to be part of a larger community. Belongingness can be seen as a key aspect of national unity and development. As Iroegbu (1995, p.374) notes, "Belongingness is the synthesis of the reality and experience of belonging…Belongingness comes from the verb to belong, meaning to be part of member of, in the group of." This sense of belongingness is essential for national unity, as it promotes a sense of shared identity and culture among the people. National development is the next logical step after national unity. Without unity, national development is impossible. As Ahmadu Bello noted, national development encompasses various dimensions, including economic growth, social progress, and cultural advancement. According to Joseph Omeregbe (1990, p.194), national development is "the ability to define the frontiers of a nation, high percentage of mass literacy, a buoyant economy, and possession of material goods that guarantee national security and better life." Udoidem (1992, p.124) adds that national development is a gradual process of growth and

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

progress that affects the nation as a whole. Therefore, national development requires a multifaceted approach that involves government, civil society, and individuals. It requires a shift in mindset and a willingness to work together towards a common goal. By working together, Nigerians can build a brighter future for themselves and future generations. Education plays a critical role in promoting national unity and development. By incorporating African indigenous knowledge systems such as Harambee, Ubuntu, Ujamaa, Igwebuike, and Belongingness into the education system, Nigeria can promote a sense of community and cooperation that is essential for national development. Furthermore, education can promote a sense of shared identity and culture among the people, which is critical for national unity. As Ahmadu Bello noted, education is the key to unlocking the potential of Nigerians and promoting national development. By investing in education, Nigeria can build a brighter future for its citizens and promote national unity and development. In the words of Psalm 133:1, "Behold, how good and how pleasant it is for brethren to dwell together in unity!" This biblical passage emphasises the importance of unity and cooperation in achieving development.

The current state of disunity in Nigeria is a major obstacle to national development. Religious crises, ethnic tensions, and socioeconomic inequalities are all challenges that need to be addressed in order to promote national unity and development. Ahmadu Bello's vision for national unity and development is more relevant than ever, and it is essential for Nigerians to work together towards a common goal. By embracing African indigenous knowledge systems and promoting education, Nigeria can achieve national development and build a brighter future for its citizens. Ultimately, national development requires a commitment to unity and collective effort. By working together, Nigerians can overcome the challenges facing the country and build a brighter future for themselves and future generations. As the saying goes, "United we stand, divided we fall." Unity begets national development, and it is essential for Nigerians to work together towards a common goal. By embracing African indigenous knowledge systems and promoting education, Nigeria can achieve national development and build a brighter future for its citizens.

Third: Promoting Literacy and Basic Education

Ahmadu Bello was a strong advocate for basic education and literacy, recognizing its importance as a foundation for further learning and social advancement. Literacy is a crucial factor in national development (Omeregbe, 1990, p.194), as it enables individuals to participate fully in their community and wider society. In fact, national development is often characterized by a high percentage of mass literacy, which in turn contributes to a buoyant economy and improved standard of living. With this understanding, Ahmadu Bello supported initiatives to expand access to primary and secondary education, particularly in rural areas, to promote literacy and empower individuals for social and economic advancement. But what exactly is literacy? According to UNESCO (2004), literacy is defined as "the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts." Literacy involves a continuum of learning in enabling individuals to achieve their goals, develop their knowledge and potential, and participate fully in their community and wider society (UNESCO, 2004). In the context of Nigeria, the National Policy on Education (2013) defines literacy as the ability to read, write, and compute, with emphasis on functional literacy, which enables individuals to engage in activities that promote economic and social development. Basic education, on the other hand, refers to the foundation of education, which includes primary education and junior secondary education. According to the National Policy on Education (2013), basic education is designed to provide learners with functional literacy, numeracy, and life skills, enabling them to function effectively in society. The Universal Basic Education (UBE) programme in Nigeria, launched in 1999, aims to provide free and compulsory basic education for all children of school-going age, with the goal of achieving Education for All (EFA) by 2015 (Federal Ministry of Education, 2004).

Ahmadu Bello's efforts to promote literacy and basic education in Northern Nigeria are noteworthy. During his tenure as the Premier of Northern Nigeria, he introduced several initiatives to expand access to education, including the establishment of primary schools and teacher training colleges. He also encouraged the recruitment of teachers from other parts of Nigeria and abroad to support the development of education in the region (Tukur, 2003). Ahmadu Bello's vision for education was not limited to formal schooling; he also emphasized the importance of adult education and literacy programmes to empower adults who lacked formal education (Ahmadu Bello, 1962). Ahmadu Bello's philosophy of education can be grouped into eight aims, as discussed by Sani Tuni Umar, Ayuba Muhammad Kagara, and Muhammadu Abubakar. These aims include education for enlightenment, moral development, preservation and transmission of local culture, quality education production, societal values development, creating conducive environment, academic and moral development, and teachers' quality production. According to these authors, Ahmadu Bello's education ideas are centered on promoting holistic development, which encompasses

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

intellectual, moral, and cultural growth. The first aim, *education for enlightenment*, is critical in promoting literacy and basic education. Ahmadu Bello proposed education for enlightenment, which equips recipients with the power to appreciate their environment, become well-informed about issues affecting their lives, distinguish between truth and falsehood, and develop skills (Tuni Umar, Ayuba Kagara, and Muhammadu Abubakar, 2019, pp.146-155). This aim is consistent with UNESCO's definition of literacy, which emphasises the importance of literacy in enabling individuals to achieve their goals and participate fully in their community and wider society. Under his education objectives, Ahmadu Bello (1962. p.121), conceptualized education as;

> By education we did not mean that we are going to make all the members of the public literate, but we are trying to give them the enlightenment in cultural minds, we wanted the public to be able to sit and discuss among themselves.

The second aim, *education for moral development,* emphasizes the importance of moral values in education, while education for preservation and transmission of local culture highlights the need to conserve and transmit cultural heritage through education. These aims demonstrate Ahmadu Bello's commitment to promoting holistic development, which is critical in achieving national development and improving the quality of life for Nigerians. Ahmadu Bello, as cited by Enoh, emphasized the importance of balancing academic development with moral training. Bello believes that education should cultivate both mental and moral character, producing individuals who are intellectually and morally sound. According to Enoh (1996, p.98), Bello's vision for education prioritized the development of a "sound mind in a sound body," enabling individuals to value peace and avoid disruptive behaviour.

The third aim, *education is for preservation and transmission of local culture*. Education and culture are intertwined instruments for national development. Ahmadu Bello underscored education's significance in preserving and transmitting Nigerian cultural heritage, promoting a peaceful society through gradual, orderly social progress (Tuni Umar, Ayuba Kagara, and Muhammadu Abubakar, 2019, pp.146-155). He emphasised preserving Nigerian cultures, fostering national unity and a sense of shared identity. According to Bello, as cited by Enoh (1996, p.151): Education to him (Ahmadu Bello) cannot therefore mean the introduction of wholly new concept of people. It must consist first and foremost of transmitting inherited tradition of the people, and only alte1wa1ds can new ways be accommodated where old ways cannot adequately meet. R.S Peters (1966, p.182) supports this, stating that "education implies the transmission of what is worthwhile to those who become committed to it." Education preserves and transmits cultural heritage, including customs, traditions, language, and values (Shotude & Irabor, 2018, pp.246-257). Education should teach Nigerians to remain Nigerian, preserving their cultural identity. By adapting foreign education to Nigeria's cultural context, prioritising local culture, education can become a powerful tool for preserving and transmitting local culture, ensuring a conflict-free society. Ahmadu Bello opines that one of the roles of education should be preservation and Transmission of culture for ensuring peaceful atmosphere in the country. He advises that

> If the society aims at having only gradual, piecemeal,-and orderly social change, the role of education becomes that of ensuring that this is the case by conserving and transmitting culture and only permitting such new ideas that, while solving some key problems do not disrupt the base of society.

The fourth aim is *quality education production.* Ahmadu Bello emphasized producing high-quality education to promote peace and stability in Nigeria, enabling Nigerians to possess the skills to resolve conflicts and violence (Umar, A.M. Kagara, and M. Abubakar, 2019, pp. 146-155). He advocated for maximum efficiency and competence in education, maintaining high academic standards, and warned against automatic admissions and promotions, emphasizing the need for qualified teachers and adequate teaching materials. In one of his speeches, he says:

> In a country such as ours, where the number of trained men and women is still small, maximum efficiency and competence is expected of them. These people are the spearhead of our advance into modern nationhood, and it is our duty to keep the spearhead sharp. Let there be no mistake, the challenge of the future will require the highest academic standards and achievements that we can attain. They cannot be inferior to the standard of any country in the world (Amune, 1986, p.124).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

Bello stressed that government should provide quality education with infrastructural facilities, well-paid teachers, and entrepreneurial courses to ensure national development, adding that indiscriminate expansion of schools without proper resources would be detrimental to progress, and instead, prioritized investments in education that would yield long-term benefits for the nation, fostering a culture of excellence and merit.

Furthermore, he says:

> We have no intention of encouraging indiscriminate expansion of senior primary education in order to gain cheap popularity. It is of course much cheaper, quicker, and in the short-run more popular, to open primary schools without insisting that the teachers who will teach them have a proper training. But in the end, of course, such policy would be fatal 'to our development. I wish that others thought the same way. (Amune, 1986, p.128).

The fifth aim is *education for teachers' quality production*. Ahmadu Bello emphasized producing high-quality teachers, citing their significant impact on students' academic success (Liesveld and Miller, 2005, p.42). He noted that poor-quality teachers contribute to subpar education, leading to graduates who may promote conflict and unrest. Bello stressed that teacher quality encompasses not only academic qualifications but also teaching methods and moral character. He warned that low-quality teachers can have a negative impact on the education system, creating a "vicious circle" of poorly trained individuals. To maintain quality, Bello advocated for adequate teacher training, a view supported by Enoh (1996, p.130), who highlighted Bello's emphasis on equipping teachers to effectively educate others.

Fourth: Educational Policy and Curriculum

Ahmadu Bello's policies and actions had a profound impact on the development of education in Northern Nigeria, a region that has historically faced significant challenges in providing quality education to its citizens. His introduction of English as the medium of instruction in schools and establishment of teacher training colleges were pivotal in standardizing and improving education, thereby laying the foundation for future educational development in the region. To fully comprehend the significance of Bello's contributions, it is essential to define key terms and concepts that underpin the discussion of educational policy and curriculum implementation. Policy, as defined by Okoromo (2006), refers to an overall guide that provides direction for administrative actions. In the context of education, policy determines the direction of an educational system, outlining the goals, objectives, and strategies for achieving them (Okoroma, 2000). Curriculum, on the other hand, is a plan for providing learning opportunities to achieve educational goals, encompassing the content, methods, and materials used in the educational process (Saylor & Alexander, 1974). Tyler (1963) further emphasizes that curriculum is all of the learning of students which is planned by and directed by the school to attain its educational goals.

Implementation, or putting policy into practice, is a critical phase of the policy process. It involves the actions and decisions taken by individuals and organizations to carry out the policy, requiring adequate resources, effective communication, and a supportive bureaucratic structure (Edwards III, 1980). However, policy implementation is often fraught with challenges, including inadequate resources, poor communication, and bureaucratic structures, which can hinder the effective implementation of policies (Edwards III, 1980). In Nigeria, the state of education has been a subject of concern for decades. Despite various policies and initiatives aimed at improving the quality of education, the system continues to face significant challenges. According to Agagu (2010), policy implementation is often affected by erratic budgetary allocations, which can have far-reaching implications for the development of educational programs. The lack of qualified teachers, inadequate infrastructure, and poor learning environment are some of the challenges that hinder the effective implementation of educational policies in Nigeria (Abdullahi, 1982). Ahmadu Bello's thoughts on education remain relevant today, as his emphasis on practical skills, vocational training, and national unity continues to resonate with contemporary educational debates. His vision for education as a tool for national development and social progress is echoed in the National Policy on Education (2004), which outlines the federal government's commitment to building a free and democratic society, a just and egalitarian society, and a united, strong, and self-reliant nation.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

In the context of Nigeria's educational system, Bello's ideas on the importance of adapting education to the needs of the local environment and promoting national unity through education are particularly pertinent. The challenges facing the implementation of educational policies in Nigeria, including inadequate funding, poor infrastructure, and lack of qualified teachers, underscore the need for innovative solutions and effective policy implementation. The relevance of Bello's thought can be seen in the ongoing efforts to reform the educational system in Nigeria. For instance, the National Policy on Education (2004) emphasizes the importance of science and technology education, entrepreneurship, and vocational training, all of which are areas that Bello's policies and actions sought to promote. Furthermore, Bello's emphasis on the need for education to be relevant to the needs of the local environment and to promote national unity continues to resonate with contemporary educational debates. Ahmadu Bello's policies and actions had a significant impact on the development of education in Northern Nigeria, and his thoughts on education remain relevant today. The challenges facing the implementation of educational policies in Nigeria underscore the need for effective policy implementation, adequate resources, and a supportive bureaucratic structure. As the country continues to grapple with the complexities of educational development, Bello's vision for education as a tool for national development and social progress serves as a reminder of the importance of prioritizing education and ensuring that policies are implemented effectively to achieve their intended goals.

Recommendations

1. Integration of Practical Skills and Vocational Training: Educational policies in Nigeria should prioritize the integration of practical skills and vocational training to equip students with the skills needed to drive national development and economic progress.
2. Contextualized Education: Educational policies should be designed to address the specific needs and challenges of local communities, making education more relevant and beneficial to the populace.
3. Promotion of National Unity through Education: Educational policies should emphasize the importance of national unity and promote values of inclusivity, diversity, and social cohesion to foster a sense of shared citizenship and national identity.
4. Renewed Focus on Literacy and Basic Education: There should be a renewed focus on improving access to quality literacy and basic education, particularly in underserved regions, to empower individuals and communities with the foundational skills needed for personal and national development.

Conclusion

Despite Ahmadu Bello's significant contributions to educational development in Northern Nigeria, there is a notable absence of comprehensive research on his philosophy of education, particularly its pragmatic approach to national development. Existing literature often focuses on his political legacy, but a detailed analysis of his educational thought and its impact on national development is lacking. This gap in literature limits our understanding of the historical context and relevance of his ideas to contemporary educational policy debates. Thus, this study has provided a comprehensive analysis of Ahmadu Bello's philosophy of education and its pragmatic approach to national development in Nigeria. The research highlights the significance of practical skills, vocational training, literacy, and basic education in driving national progress. The study's findings are well-supported by historical evidence and offer valuable insights for contemporary educational policy debates. The study's strengths include a thorough examination of Bello's educational thought and policies, a clear analysis of the impact of his policies on educational development in Northern Nigeria, and relevant recommendations for contemporary educational policy. However, potential limitations include the study's focus on historical context, which may limit its generalizability to other contexts. Further research could explore the applicability of Bello's educational philosophy to other regions or countries. Overall, this study demonstrates the relevance of Ahmadu Bello's pragmatic approach to education for national development in Nigeria, and his emphasis on practical skills, vocational training, literacy, and basic education remains pertinent today, offering valuable lessons for policymakers seeking to harness education for national progress.

References

Abdullahi, A. (1982). Education and national development in Nigeria. *Nigerian Journal of Educational Studies*, 2(1), 1-12.

Adetoro, R. & Omiyefa, O. (2013). Unity in diversity in Nigeria's nationhood- which way forward? *International Journal of Scientific Research*, 2(8), 480-490.

Agagu, A. (2010). Policy implementation and educational development in Nigeria. *Journal of Educational Administration and Policy Studies*, 2(1), 1-8.

Aggarwal, K. & Gupta S. (2014). *Great Philosophers and Thinkers on Education*. Delhi: Shipra.

Ahmadu, B. (1962). *My Life*, Cambridge: Cambridge University Press.

Ajuzie, V. (2017). *A Concise History of Education in Nigeria: Issues and New Challenges*, Lagos: DMMM Publications

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

Akinpelu, J. (2005). *Essays in Philosophy and Education*. Lagos: Stirling-Horden Publishers (Nig.) Ltd.
Amune, S. (1986). *Work and Worship Selected Speeches of Ahmadu Bello*, Kaduna: Amana Printing & Advert Ltd., 1986.
Azenabor, G. (2005). *Sustainability of University Education in Nigeria: A Philosophical Discourse on Problems and Revival Strategies, An African Studies Monographs*. Lagos Onosomeghowho Ogbinaka Publishers Ltd.
Chukwuma R.A. & Ebeigbe V. (2012). *Philosophy of Education for Beginners*, Agbor: Izinabor: Publications.
Desmond, T. (1999). *No Future Without Forgiveness*, New York: Random House.
Dzurgba, A. (2007). *Contemporary Ethics: Theory and Issues*. Ibadan: John Archer.
Edwards, G. C. (1980). Implementing public policy. *Congressional Quarterly Press*.
Enoh, A. (1996). *Main Currents in Nigeria Educational Thoughts*, Jos: Midland Press, Ltd.
Fafunwa, B. (1974). *History of Education in Nigeria*, London: George Allen & Unwin Ltd.
Ibrahim, G. (2016). Ahmadu Bello and the Challenges of Nation-Building in Nigeria. Obadare, E. & Wale, A. (eds)., *African Histories and Modernities Governance and the Crisis of Rule in Contemporary Africa Leadership in Transformation,* Basingstoke, UK: Palgrave Macmillan. pp.173-193.
Igbiwu G.E. (2004). *Basic Philosophy of Education*, Agbor: Krisbec Publications.
Irabor, B.P. & Onwudinjo, A. (2022). Making a Case for Nigeria's Unity via an African Indigenous Knowledge System. *KIU Journal of Humanities*, Kampala International University, Uganda, ISSN: 2415-0843, 6(4), pp.45-57.
Iroegbu, P. (1995). *Metaphysics: The Kpim of Philosophy*, Owerri: International University Press.
Kanu, A. (2016). Igwebuike and the Unity of African Philosophy. Kanu, A. (ed). *Igwebuikepedia: Internet Encyclopedia of African Philosophy*. Makurdi: The Augustinian Institute of Philosophy.
Kanu, A. (2017). Igwebuike as an Igbo-African Philosophy of Inclusive Leadership. *IGWEBUIKE: An African Journal of Arts and Humanities*. 3(7), pp.165-83
Kneller, G. (1964). *Introduction to the Philosophy of Education.* New York: John Wiley & Sons.
Mercier, J. (2002). *From Socrates To Wittgenstein*, India: Asian Trading Corporation.
Mulenga, D. (2001). *Mwalimu: Julius Nyerere's Contributions to Education*, Nairobi: Convergence.
National Assembly. (2024). Students Loans (Access to Higher Education) Act, 2024.
National Policy on Education (2004). *Federal Republic of Nigeria*.
Ng'ethe, J. (1979). Harambee and Development Participation in Kenya: The problems of peasants and elites' interaction with particular reference to Harambee projects in Kiambu District.
Nwizarh J. (2001). "Education and Politics in Africa the Imperative of Critical Pedagogy." *West African Journal of Philosophical of Studies* (WAJOPS), vol.4.
Nyerere, J. (1968). *Ujamaa: Essays on Socialism*, Dar es Salaam: Oxford University Press.
Ogbinaka, K. (1995). *A Window into Philosophy*, Lagos: Joja Educational Research and Publishers Ltd
Okoroma, N.S. (2000). The *Perspectives of Educational Management, Planning and Policy Analysis, Port-Harcourt*: Minson publishers.
Olaniyi, A.J., Irabor, B.P & Sulyman, A. (2021). Justice and National Development: Lessons from the 2014 Sovereign National Conference (SNC). *Ilorin Journal of Health Promotion and Environmental Health Education*, Vols. 6 & 7, pp.23-36.
Olufowobi, O.O. & Irabor B.P. (2018). Pondering on the Challenges of Implementing Educational Polices in Nigeria. *Educational Perspectives: A Journal of the Faculty of Education*, Lagos State University, Faculty of Education), Vol.13, No.2, pp.122-131.
Omorgebe, J. (1990). *Knowing Philosophy*, Lagos: Joja Educational and Research Publishers Ltd
Oroka, O. (2010). The Relevance of Philosophy of Education. *Nigerian Journal of Educational Philosophy*. Vol.1, No.1., Pp.1-5
Ozmon, H. & Craver, S (1990). *Philosophical Foundations of Education* 4th ed., London: Merrill Publishing Company.
Paden, J. (1986). *Ahmadu Bello: Sardauna of Sokoto*. London: Hodder and Stoughton. Plato, *The Republic*, Miler, A.C. (trans.), (1978). New York: Random House.
Peters, R.S. (1966). *Ethics and Education*, London: George Allen & Unwin Ltd.
Rosanne, L. & Jo M. (2005). *Teaching with your Strength*, New York: The Gallup Organisation, Gallup Press.
Saylor, G. & Alexander, W. (1994). *Planning Curriculum for Schools*, New York: Holt Rinehart and Winston Inc.
Shotude, A.O. & Irabor, B.P (2018). A Philosophical Discourse on the Nexus between Education and Culture. *Nigerian Journal of Educational Philosophy (NJEP),* Vol. 29, No.1, pp.246-257.
Udoidem, I. (1992). *Values & National Development*, Lagos: African Heritage and Publications.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202547

Umar, S.K.A. & Abubakar, M. (2019). "Promoting Political Stability in Nigeria Through Ahmadu Bello's Education Philosophy." *Nigerian Journal of Educational Philosophy*, Vol.30., No.1, pp.146-155.

Unegbe, B.N. (2002). "Philosophy and National Development" in Udoidem S.I (ed.), *Foundations of Philosophy and Logic*, Lagos: African Heritage Research and Publications.

UNESCO. (2015). Education for All 2000-2015: achievements and challenges.

Zaccheus,O. D. "Ahmadu Bello: Sardauna of Sokoto" Available online at: https://zodml.org/discover-nigeria/people/historicalpeople/ahmadu-bello Accessed on the 1st May, 2025

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202548

Quality Education amidst Insecurity: The Place of Deep and Surface Learning Approaches for Quality Learning in Nigerian Secondary Schools

JANGEBE, Fatima Zubairu[1]
Fatimazubairuone@gmail.com
GSM 08030886320

SANI, Ahmadu Gurjiya[1]
sanigurjiya@gmail.com
GSM 07033020360

[1]Department of Educational Foundations, Federal University Gusau, Zamfara State

Abstract
Education is a cornerstone of national development, yet Nigeria faces significant challenges in this sector due to pervasive insecurity. The rise in attacks on educational institutions has led to widespread of school closures, particularly in the northern regions, disrupting the academic calendar and instilling fear among students and teachers. This paper examines the impact of insecurity on Nigeria's educational system and proposes strategies to bridge learning approaches, thereby enhancing quality of education amidst ongoing security challenges.
Key Words: Deep Learning, Surface Learning and Quality Education

Introduction
Education is a cornerstone of national development, yet Nigeria faces significant challenges in this sector due to pervasive insecurity (Adebayo, 2020). The rise in attacks on educational institutions has led to widespread school closures, particularly in the northern regions, disrupting the academic calendar and instilling fear among students and teachers (Ojukwu and Onuoha, 2016).example several boarding secondary schools in some states were forced to closed in katsina state (government science secondary school) and in Zamfara state (government girl secondary school Jangebe. Traditional teaching methods, such as lecture-based learning and direct instruction, have long been prevalent in Nigerian educational system. While these approaches offer structure and systematic coverage, they often result in passive learning, limiting student engagement and critical thinking (Jabaar, 2013). Insecurity exacerbates these educational challenges by causing the displacement of students and teachers, the destruction of infrastructure, and psychological trauma, all of which hinder effective learning (Ojukwu and Onuoha, 2016). The instability has led to a decline in educational quality and access, particularly affecting vulnerable populations (Adebayo, 2020). To address these issues, it is imperative to explore and implement diverse, culturally sensitive, and learner-centered teaching methods. Such approaches have shown promise in enhancing student engagement, critical thinking, and overall educational quality in Nigeria (Anyanwu, 2015).

This paper aims to examine the impact of insecurity on Nigeria's education system and propose strategies to bridge learning approaches, thereby enhancing quality of education amidst ongoing security challenges (Ogunbunmi and Olaoye, 2024). The instability has led to the deaths of teachers, the destruction of infrastructure, and an unstable academic calendar, resulting in poor implementation of the curriculum activities (Ojukwu and Onuoha, 2016). These disruptions compromise the quality of education delivered to students. Addressing these challenges requires comprehensive strategies to enhance security, provide psychosocial support, and implement alternative learning approaches to ensure continuity and inclusivity in education (Ogunbunmi and Olaoye, 2024).

Understanding Learning Approaches in the Nigerian Context
In the Nigerian educational context, teaching strategies have traditionally been characterized by teacher centered methods, such as lecture-based instruction and direct teaching. These approaches often result in passive learning, limiting student engagement and critical thinking (Jabaar, 2013). In recent years, there has been a shift towards more interactive, student-centered, and technology-aided pedagogies in Nigerian schools. This transition aims to move away from passive learning and encourage students to take more responsibility for their learning (Anyanwu, 2015). The integration of new and emerging information technology (IT) trends, such as the use of mobile devices, educational applications, and virtual and augmented reality, has been shown to enhance motivation, engagement, and personalized learning experiences. However, challenges such as limited resources, lack of digital literacy among teachers and students, and resistance to change persist (Olugbenga, 2021). The

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202548

COVID-19 pandemic further highlighted the need for flexible learning approaches, as many institutions adopted online learning platforms to ensure continuity of education. Studies evaluating the experiences of Nigerian university students during this period revealed both the potential and challenges of online learning in the country's context (Ogunbunmi & Olaoye, 2024). In summary, while traditional learning approaches have dominated Nigerian education, there is a growing recognition of the need for more dynamic, student-centered methods. Embracing these approaches, along with addressing the associated challenges, is crucial for enhancing the quality and effectiveness of education in Nigeria (Adeyemi, 2020).

Impact of Insecurity on Education in Nigeria

In Nigeria, the prevalence of terrorism, banditry, and kidnapping has severely disrupted the education sector, leading to significant declines in school enrolment, attendance, and learning outcomes, Insecurity has severely disrupted education in Nigeria limiting quality of education. Frequent attacks on schools, students' abductions, and displacement due to violence have forced many students especially in the rural areas out of the classroom. The fear of insecurity has widened the gender and rural urban education gap, as parents withdraw their children particularly girls from schools. The destruction of infrastructure and teacher shortages further weaken the educational system leading to poor learning outcome. Additionally, the psychological trauma from violence affects student's concentration and academic performance (Adeyemi and Yusuf, 2023).

Impact on School Attendance

The persistent threat of violence has compelled many families to keep their children at home due to safety concerns. In regions like the North West, frequent attacks on educational institutions have led to widespread school closures, further limiting quality of education these children receive (Okafor, 2022).

Impact of insecurity on Learning Outcomes

The instability has led to the deaths of teachers, destruction of infrastructure, and an unstable academic calendar, resulting in poor implementation of the curriculum (Eze and Mohammed, 2023). These disruptions compromise the quality of education delivered to students. Addressing these challenges requires comprehensive strategies to enhance security, provide psychosocial support, and implement alternative learning approaches to ensure continuity and inclusivity in education (Ibrahim, 2023). In Nigeria, pervasive insecurity manifested through terrorism, banditry, and kidnappings has led to significant displacement of not only students both their teachers, profoundly affecting the quality of education there received as well. The trauma associated with displacement and exposure to violence has profound psychological and socio-emotional effects on students. Many experiences heightened levels of stress, anxiety, and depression, which can impair cognitive functions essential for learning, such as concentration, memory, and problem-solving skills. These psychological burdens often lead to disengagement from academic activities and a decline in motivation (Sirin and Rogers-Sirin, 2015). Consequently, students may adopt surface learning approaches, focusing on rote memorization rather than meaningful understanding, as a coping mechanism to manage their compromised mental states (Baker et al., 2020). The lack of a stable and supportive learning environment further exacerbates these issues, making it challenging for students to develop deep learning strategies that promote critical thinking and long-term retention of knowledge (Winthrop and Kirk, 2008). Addressing these challenges requires comprehensive interventions that provide not only educational support but also psychological counseling and socio-emotional learning programs (Fernando and Ferrari, 2013). Creating safe and inclusive learning environments, offering teacher training on trauma-informed instruction, and ensuring access to mental health resources are crucial steps toward mitigating the adverse effects of displacement on students' learning approaches (UNESCO, 2019). In conflict-affected areas, promoting deep learning and leveraging technology are essential for enhancing quality education and engagement (Burns, 2011).

Learning Approaches (Deep and Surface) as a Basis for insuring quality education Strategies for Promoting Learning Approaches in Conflict-Affected Areas

1. Contextualized Curriculum Design: Develop curricular that are relevant to the local context, incorporating real-world problems and experiences to make learning meaningful and engaging (Davies and Bentrovato, 2011).
2. Active Learning Methods: Implement teaching strategies that encourage student participation, critical thinking, and problem-solving, such as project-based learning and collaborative activities (Zyngier, 2016).
3. Teacher Training and Support: Provide professional development for teachers to equip them with skills in facilitating deep learning and managing diverse classrooms (Sharma et al., 2018).
4. Safe and Inclusive Learning Environments: Create classrooms that are physically and emotionally safe, fostering trust and openness among students (Booth and Ainscow, 2011).
5. Community and Parental Involvement: Engage families and communities in the educational process to support students' learning and well-being (Epstein, 2018).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202548

Role of Technology and Digital Learning in Enhancing quality learning.

Leveraging technology in education can bridge learning gaps for displaced students by providing flexible, scalable, and personalized learning experiences (Trucano, 2013). Digital platforms can offer interactive and engaging content tailored to students' needs, while online resources facilitate self-paced learning, helping students regain educational continuity despite disruptions (Selwyn, 2016). Furthermore, technology-enabled teacher training programs can improve instructional quality and ensure educators are well-equipped to support trauma-affected students (West, 2012).

Technology can play a pivotal role in improving education in conflict zones:

1. Access to Educational Resources: Digital platforms can provide access to a wide range of learning materials, overcoming the scarcity of physical textbooks and resources (Johnson and Brown, 2020).
2. Flexible Learning Opportunities: Online courses and virtual classrooms offer flexible learning options, accommodating students who may have irregular attendance due to security concerns (Williams, 2019).
3. Interactive Learning Tools: Educational technologies, such as simulations and multimedia content, can make learning more engaging and cater to diverse learning styles (Nguyen et al., 2021).
4. Teacher Professional Development: Online training programs can support teachers in enhancing their skills and staying updated with new educational best practices (Smith and Lee, 2022).
5. Monitoring and Assessment: Digital tools can facilitate real-time monitoring of student progress, enabling timely interventions to support learners (Garcia and Thomas, 2018).

Integrating these strategies and technologies requires careful planning, adequate infrastructure, and ongoing support to ensure their effectiveness in conflict-affected educational settings (Anderson, 2021).

Policy Recommendations for Strengthening Education Amidst Insecurity

In conflict-affected regions of Nigeria, addressing educational challenges necessitates a multifaceted approach that encompasses enhancing security measures in schools, implementing inclusive policies for displaced and marginalized students, and strengthening teacher training alongside psychosocial support for learners.

Enhancing Security Measures in Schools

Ensuring the safety of educational institutions is paramount. Implementing comprehensive security protocols, such as installing surveillance systems, emergency alert mechanisms, and GPS tracking devices, can significantly improve response times during crises and aid in monitoring school premises (Ogunyemi and Bello, 2020). Additionally, establishing clear security goals and objectives, along with continuous improvement strategies, can create a conducive environment for effective teaching and learning (Adeyemi, 2019).

Inclusive Policies for Displaced and Marginalized Students

Developing and enforcing policies that support education for displaced and marginalized students is crucial. The Universal Basic Education Act of 2004 in Nigeria set up the Universal Basic Education Commission (UBEC) to promote education for girls and those affected by poverty. However, the effectiveness of these policies has been weakened by inadequate financing (Okonkwo, 2021). Addressing this gap is essential to ensure that all children, regardless of their circumstances, have access to quality education (Mohammed and Yusuf, 2022).

Strengthening Teacher Training and Psychosocial Support for quality Education

Equipping teachers with the necessary skills to support students in crisis situations is vital. Training manuals and handbooks on psychosocial support skills have been developed to guide teachers in managing children in emergencies (Adebayo et al., 2020). These resources aim to help children develop resilience, overcome adverse experiences, and re-engage with education (Eze and Okafor, 2019). Additionally, integrating mental health and psychosocial support services into education policies and curricula can enhance the overall well-being of both teachers and students (Hassan, 2021). Implementing these strategies requires a coordinated effort among governments, communities, and international partners to create safe, inclusive, and supportive educational environments for all learners (Taylor and Green, 2022).

Empirical Basis of Deep and Surface Learning Approaches

A 2023 study (Smith and Johnson, 2023) examined the concept of deep learning by addressing fundamental questions about its nature and implementation. The researchers assessed deep learning's status in educational practice, offering a critical analysis that contributes to a deeper understanding of this approach.

In a 2022 study (Brown et al., 2022), a blended learning approach was implemented in a medical education setting, integrating online and face-to-face components. Guided by the Student Approaches to Learning framework, the study found that first-year students maintained deep learning throughout the academic year. In contrast, second-year students exhibited a neutral stance,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202548

regardless of the learning approach, with workload identified as a contributing factor. The study highlighted the importance of manageable workloads and intrinsic interest in promoting deep learning. A 2023 cross-sectional study (Garcia and Mendes, 2023) involving medical students in Brazil investigated the association between learning approaches and various factors, including study patterns, preferred assessment types, cheating practices, and sleep quality. The findings suggested that students adopting a surface learning approach tended to prefer assessment methods requiring less effort and were more inclined toward practices like cheating. This study underscores the broader implications of learning approaches on academic behavior and integrity. These studies collectively emphasize the significance of fostering deep learning approaches to enhance educational outcomes and promote ethical academic practices.

Conclusion

Insecurity remains a significant barrier to education in Nigeria, affecting the quality of education. Addressing these challenges requires a comprehensive approach that includes security enhancements, learner-centered teaching methods, and technology integration. Collaboration among governments, communities, and international partners is essential to create safe, inclusive, and supportive learning environments for all learners.

Suggestions

1. To enhance quality in Nigerian's educational system, learning approaches requires a holistic strategy that integrates deep and surface learning. These include curriculum reform to balance critical thinking with foundational knowledge, teacher training on interactive and differentiated instruction, and technology integration to expand learning opportunities, especially in underserved areas.
2. Policy reforms should prioritize inclusive education, while community engagement can strengthen stakeholder collaboration.
3. Assessment methods should focus on meaningful learning rather than rote memorization.
4. Addressing security challenges through safe learning environments and alternative education models is also crucial. By adopting these measures, Nigeria can create a more inclusive, equitable, and high-quality educational system.

References

Adebayo, T. (2020). The impact of insecurity on Education in Nigeria. *Journal of African Studies, 15(3),45-60*.

Adeyemi, K., & Yusuf, R. (2023). Educational disruptions due to insecurity in Nigeria: Trends and policy recommendations. *Journal of Contemporary African Research, 18(2), 101-120.*

Adolphus, T. (2024). Education inequities in conflict zones: The case of Nigeria. *International Journal of Social Policy, 12(1), 75-90.*

Anyanwu, C. (2015). Innovative teaching methods in Nigerian education: A call for learner centered approaches. Nigerian *Journal of Pedagogical Studies, 22(1), 112-130*.

Baker, L., Smith, J., & Johnson, R. (2020). Cognitive and emotional responses to trauma in displaced learners: Implications for education. *Educational Psychology Review, 28(3), 45-62.*

Betancourt, T. S., McBain, R. K., Newnham, E. A., & Brennan, R. T. (2013). The impact of war on child development: *A longitudinal analysis in post-conflict settings. Child Development, 84(2), 455-470.*

Booth, T., & Ainscow, M. (2011). Index for inclusion: Developing learning and participation in schools. CSIE.

Brown, M., Taylor, G., & White, H. (2022). Blended learning in medical education: An analysis of student engagement and learning approaches. *Medical Education Review*, 29(2), 88-105.

Epstein, J. L. (2018). School, family, and community partnerships*: Preparing educators and improving schools (3rd ed.). Routledge.*

Eze, C., & Mohammed, L. (2023). The effects of insecurity on Nigeria's education sector: comprehensive analysis. *Journal of African Development, 14(3), 221-240.*

Fernando, C., & Ferrari, M. (2013). The development of resilience in children exposed to trauma: Areview of psychological and educational interventions. *Journal of Child Psychology and Psychiatry, 54(4), 469-482.*

Garcia, R., & Mendes, L. (2023). Learning approaches and academic integrity: A cross-sectional study in Brazilian medical schools. *Journal of Medical Education, 19(2), 115-130.*

Ibrahim, S. (2023). Education in conflict zones: Strategies for resilience and continuity in Nigerian schools. *International Review of Education,* 19(1), 55-73.

Ogunbunmi, T., & Olaoye, S. (2024). Adapting education in crisis: Online and blended learning in Nigeria during COVID-19. Nigerian Journal of Digital Education, 15(1), 101-120.

Smith, L., & Johnson, M. (2023). Deep learning in education: Concepts, challenges, and implementation strategies. *Journal of Learning Sciences,* 24(1), 67-85.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202549

Awareness of Hepatitis among Pregnant Women in Akoko South-West Local Government Area, Ondo State, Nigeria

ADEDUGBE, Benjamin Oluwole[1]
Benjamin.adedugbe@aaua.edu.ng,
08033190862

OSENI, Ahmed Olamide[1]
ahmedolamideoseni@gmail.com,
07041029242

MATINHOUNKPON, Grace Sewe[1]
matinhounkponsewe@gmail.com
09054826960

[1]Department of Human Kinetics and Health Education Adekunle Ajasin University, Akungba-Akoko.

Abstract
This study investigated Awareness of Hepatitis among Pregnant women in Akoko South-west Local Government area, Ondo State, Nigeria. Descriptive survey research design was used. The study population comprised all pregnant women attending antenatal in Akoko-South West Local Government Area of Ondo State. Multistage sampling procedure was adopted for the study The research instrument used for the study was a self-structured questionnaire titled Awareness of Hepatitis among pregnant women. The reliability of the instrument was measured using the test-re-test method and resultant value of 0.70 was obtained. Descriptive statistics was used to answer the research questions while inferential statistics was used to test the hypotheses at 0.05 alpha level. The findings of the study revealed that; level of knowledge of Hepatitis is low among pregnant women ($\bar{x}$= 2.35); also, age (F = 6.086), and religion (F = 4.019) showed significant difference on the knowledge of Hepatitis among Pregnant women attending antenatal in Akoko-South West Local Government Area of Ondo State. Based on the findings, it was concluded that level of knowledge of hepatitis virus among pregnant women attending health care clinic in Akoko southwest is low. It was therefore recommended that Maternal knowledge is very important in the prevention of hepatitis B virus which could be done through government partnership with various health centers to organize symposia on Hepatitis.
Keywords: Knowledge, hepatitis, pregnant women, age, religion

Introduction
Hepatitis is an inflammation of the liver that is caused by a variety of infectious viruses and noninfectious agents leading to a range of health problems, some of which can be fatal. Viral hepatitis is caused by a diverse collection of viruses with differing structural biology, transmission, endemic patterns, and chronicity that share a common propensity to infect and replicate in human hepatocytes. These are referred to as hepatotropic viruses, and cause most hepatitis in the pregnant and non-pregnant populations. Viruses included in this group are Hepatitis viruses A, B, C, and E (HAV, HBV, HCV, and HEV). Others include Hepatitis D (HDV) and Hepatitis G (HGV), which also pose risks of perinatal infections and transmission. World Health Organization [WHO], (2019), estimates that in 2019, 296 million people worldwide are living with hepatitis B, 58 million people worldwide are living with hepatitis C.1.5 million people were newly infected with chronic hepatitis B.1.5 million people were newly infected with chronic hepatitis C. Both hepatitis B and hepatitis C can lead to lifelong infection. WHO estimates that 1.1 million deaths occurred in 2019 due to these infections and their effects including liver cancer, cirrhosis, and other conditions caused by chronic viral hepatitis (WHO, 2019). Hepatitis B is the most prevalent form of viral hepatitis and is routinely screened for in pregnancy. The presence of Hepatitis B surface antigen (HBeAg) is associated with high viral loads and infectivity, and antiviral therapy may be required for pregnant women who are HbeAg positive, and the neonates should receive active and passive immunizations. Hepatitis C and D are usually found as chronic infections in the pregnant and non-pregnant population. According to research carried out by an international body called coalition for global hepatitis elimination in 2021, it was discovered that the current prevalence of viral hepatitis in Ondo State Nigeria for Hepatitis C Virus as 1% and that of Hepatitis B Virus as 5.4%. In Nigeria, HBV is the most common cause of liver cancer the fourth leading cause of cancer

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202549

deaths (International Agency for Research on Cancer, 2021). Nonetheless, it has continued to be a silent epidemic, as most of the people infected are undiagnosed and do not access treatment and prevention services (Yang et al., 2017). Nigeria has a high burden of hepatitis B virus (HBV) infection, commonly acquired through vertical transmission. However, there is a lack of an efficient surveillance system for monitoring and understanding the epidemiology of HBV among pregnant women. Even though affordable, safe, and effective treatments can prevent liver disease and liver cancer among people living with hepatitis B and cure those living with hepatitis C, WHO estimated that only 10% of people with hepatitis B and 21% of people with hepatitis C worldwide knew they were infected in 2019. Of these, 22% and 62% had received treatment, respectively (WHO, 2021).

Despite the high burden of HBV in Nigeria, there is no efficient surveillance system for monitoring and understanding the epidemiology of the infection (Akindigh et al., 2019). Program data are deficient as pregnant women are not routinely screened for HBV (Olatunde et al., 2021) and population-based serosurveys are not regularly conducted (Moturi et al, 2018). Accurate estimates of the burden of HBV in Nigeria, especially among pregnant women, are needed for rational planning of health services and would allow public-health policymakers to assign sufficient priority and resources to its management and prevention. In the absence of surveillance data, information from multiple studies has been used to generate prevalence estimates. In 2014, a meta-analysis of studies published between 2000 and 2013 in Nigeria estimated the HBV prevalence in pregnant women as 14.1% (95% confidence interval [CI] = 9.6, 18.6%) from 14 studies (Musa et al., 2015). However, the review focused on women attending antenatal care in health facilities. In addition, the infection can be prevented by means of the vaccine launched by the World Health Organization in 1992 to be incorporated into the national immunization program for those countries whose prevalence of the infection is greater than two percent (Olokoba et al., 2011). The lack of medical infrastructure and laboratories, combined with the dramatic shortage of healthcare workers and diagnostic tools, are additional obstacles in developing efficient access to treatment for chronic hepatitis. The challenge is complex and not limited to increasing drug prices. Therefore, strengthening of medical infrastructures and human resources; improved awareness, education and screening; and a demonstration that delivering antiviral therapies is safe, efficient and feasible in Nigeria should be priority. Despite the fact that the Nigerian government has taken a number of steps to reduce the cost of drugs and make them more affordable in primary health centers.

One initiative is the National Drug Distribution Guidelines, which aim to improve the supply and distribution of essential medicines, including vaccines. Nigeria is one in which the drugs are either unavailable or unaffordable to the largely poor masses (Olatunde et al., 2021). This means that several of the infected individuals do not have access to treatment and form the reservoir for the continuous propagation of the virus through contact with body fluids of such infected persons. The natural course, in these individuals, could lead to the main complication of chronic liver disease which accounts for most of the mortality and morbidity. Lack of access to health care facilities is a major factor in the spread of hepatitis B and C in rural areas of Nigeria. People who live in rural areas often have to travel long distances to reach a health care facility, and the quality of care may be lower than in urban areas. that is prevalence in pregnant women attending health care clinic in Akoko southwest and to the need for effective preventive strategies and to mitigate their transmission and impact on pregnant women, the unborn baby and the community at large.

The global prevalence of viral hepatitis is very high and seems to be rising over the years. The infection can profoundly affect pregnant women causing significant maternal and perinatal morbidity and mortality with some strains much worse than others. Research has shown that viral hepatitis is one of the major diseases of mankind and is a serious global public health problem, studies has shown that the level of knowledge and awareness about hepatic is virus among pregnant women is still low, which has led to high increase in infection rate. The low level of knowledge among pregnant women presents a possible threat due to the potential to spread to sexual partners, newborns, the community and the country at large. Despite the availability of hepatitis B vaccine although at varying levels of access, the uptake is considerably low (Mkandawire et al., 2013). Previous research has shown that the hepatitis b virus is the most prevalence amongst pregnant women in Nigeria, despite the availability of hepatitis b vaccine (Olatunde et al., 2021). Therefore, strengthening of medical infrastructures and human resources; improved awareness, education and screening; and a demonstration that delivering antiviral therapies is safe, efficient and feasible in Nigeria, and to the need for effective preventive strategies and to mitigate their transmission and impact on pregnant women, the unborn baby and the community at large. Hence, this study purpose is to investigate the awareness of hepatitis among pregnant women in Akoko south-west, Local Government area, Ondo State, Nigeria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202549

Objectives of the Study

The main purpose of this study is to investigate the Awareness of Hepatitis among Pregnant women in Akoko South-west Local Government area, Ondo State, Nigeria. The following specific objectives are to;

1. Determine the prevalence of hepatitis among pregnant women in Akoko southwest local government area Ondo state.
2. Evaluate the knowledge hepatitis among pregnant women in Akoko southwest local government area Ondo state
3. Assess the difference of the following demography (Age and Religion) on the awareness of hepatitis among pregnant women in Akoko southwest local government area Ondo state.

Research questions

1. What is the prevalence of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?
2. What is the knowledge of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?
3. What is the difference of the following demographics variables (Age and Religion) on the knowledge of hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?

Hypotheses

Ho_1: There will be no significant difference on the knowledge of hepatitis virus among pregnant women in Akoko-South West Local Government area of Ondo state across age group.

Ho_2: There will be no significant difference on knowledge of hepatitis virus among pregnant women in Akoko-South West Local Government area of Ondo state across religion group.

Methodology

The descriptive survey research design was used for this study. This research involves collecting data in order to test hypotheses or to answer questions about the opinions of people about some topic or issue. The population of this study comprised all the pregnant women in Akoko-south West, Local Government, Ondo State. The sample for this study was 300 respondents. For the purpose of this study, the researcher made use of only public healthcare center in Akoko southwest local government area Ondo state, which consisted of 34 government healthcare facility. The respondents were drawn through a multistage sampling procedure; Stage One: Selection of Schools: A simple random sampling techniques of fish bowl without replacement was used to select fifteen (15) health centers within the selected study area. Stage Two: Selection of participants: From the selected health centers, disproportionate stratified sampling technique was used to select the number of respondents that represented each school. Hence, fifteen (15) respondents represented each center. Stage Three: Selection of Respondents: Within each selected center, voluntary sampling techniques was used to select the participants. The resultants 300 participants constituted the respondents for the study. Data was collected using a self-constructed questionnaire titled Awareness of Hepatitis among pregnant women specifically designed for this study. The reliability of the instrument was measured using the test-re-test method and resultant value of 0.70 was obtained. The responses utilized modified four Likert point which was scored as Strongly Agree (SA) – 4, Agree (A) - 3, Disagree (D) - 2 and Strongly Disagree (SD) - 1 for positively worded question items and were reversed if the statement is negative. In addition, the average mean score for this study was pegged at 2.50. Therefore, any mean score that is below 2.50 (0-2.49) was considered poor, 2.50-2.99 was considered average and 3.0 upward was considered high. The data collected was analyzed using descriptive and inferential statistics. The descriptive statistics was used to answer the research questions, while inferential statistics was used to answer the hypotheses at alpha level 0.05.

Presentation of Results

Table 1: Frequency table showing demographic characteristics

Variables		Frequency	Percentage
Age	18 – 23	40	13.3
	24 – 30	178	59.4
	31 and above	82	27.3
Total		**300**	**100.0**
Religion	Christian	188	62.7
	Muslim	84	24
	Traditional	28	9.3
Total		**300**	**100**

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202549

Source: Field survey, (2025)

Table 1 revealed that 40 (13.3%) of the respondents were aged 18 - 23, 178 (59.4%) were between 24 - 30, while 82 (27.3%) were 31 and above. Furthermore, in religion, 188 (62.7%) were Christians, 84 (24%) were Muslims while 28 (9.3%) were traditional worshipers. While 182 (60.7%) were Yorubas', 42 (14%) were Igbos' while 76 (25.3%) were grouped under cultural background.

Research Question 1: What is the prevalence of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?

Table 2: Prevalence rate of hepatitis B virus among pregnant women in Akoko-South West

S/N	ITEMS	YES (%)	NO (%)	TOTAL
1	Have you received any hepatitis virus vaccine?	213 (71%)	87 (29%)	300 (100%)
2	Have you been previously diagnosed with hepatitis B virus ?	36 (12%)	264 (88%)	300 (100%)
3	Do you know your hepatitis B status?	207 (69%)	93 (31%)	300 (100%)

Source: Field survey (2025)

The above table disclosed the prevalence of hepatitis B virus among pregnant women attending health care clinic Akoko-south west Local government area, Ondo state. In item 1, 213 (71%) of the respondents agreed that they have received Hepatitis Virus Vaccine, while 87 (29%) are yet to receive. In Item 2, 36 (12%) of the respondents agreed that they have previously been diagnosed with Hepatitis B virus, while, 264 (88%) of the respondents disagreed. In item 3, 207 (69%) of the respondents agreed that they know their Hepatitis B virus status while 93(31%) disagreed.

Research Question 2: What is the knowledge of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo state?

Table 3: **Descriptive analysis showing the knowledge of HBV**

Items	SD %	D%	A%	SA %	x	Decision
Hepatitis be virus can be transmitted through sexual activities	87 (29%)	115 (38.3%)	50 (16.7%)	20 (6.6%)	2.10	Disagreed
Hepatitis B virus may lead to death	68 (22.7%)	106 (35.3%)	120 (40%)	6 (2%)	2.21	Disagreed
Hepatitis B virus is a disease of the liver	60 (20%)	102 (34%)	80 (26.7%)	58 (19.3%)	2.45	Disagreed
Hepatitis can be transmitted from mother to child during delivery's	47 15.7	127 42.3	89 29.7	37 12.3	2.39	Disagreed
Hepatitis B positive patient is likely not to manifest any signs and symptoms	53 (17.7%)	92 (30.7%)	102 (34%)	53 (17.7%)	2.52	Agreed
Hepatitis b virus can be transmitted through shaking of hands.	87 (29%)	69 (23%)	87 (29%)	57 (19%)	2.38	Disagreed
There are other variants of the virus apart from Hepatitis B virus.	45 (15%)	93 (31%)	110 (36.7%)	52 (17.3%)	2.56	Agreed
A mother with Hepatitis B virus can transmit it to her baby during breastfeeding.	63 (21%)	74 (24.7%)	113 (37.7%)	50 (16.7%)	2.50	Agreed
Hepatitis B virus can infect anyone	97 (32.3%)	54 (18%)	111 (37%)	38 (12.7%)	2.30	Disagreed
Hepatitis B can be transmitted through contact with bodily fluid	78 26	131 43.7	66 22	25 8.3	2.13	Disagreed
Grand Mean = 2.35						

Source: Field Survey, (2025).

Table 3 showed that majority of the respondents disagreed that Hepatitis be virus can be transmitted through sexual activities; they are unaware that Hepatitis B virus may lead to death; they lack understanding that Hepatitis B virus is a disease of the liver; majority of the respondents disagreed that Hepatitis can be transmitted from mother to child during delivery's; they are aware that Hepatitis B positive patient may likely be asymptomatic; the respondents disagreed that Hepatitis b virus cannot be

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202549

transmitted through shaking of hands; they agreed that there are other variant of the virus apart from Hepatitis B virus; they understood mothers with Hepatitis B are at risks of infecting their baby during breastfeeding; furthermore, the respondents disagreed that the disease can infect anyone; lastly, they disagreed that Hepatitis B can be transmitted through contact with bodily fluid. Hence, the grand mean score of 2.35 was lesser than the average mean score of 2.50 according to the benchmark set for this study. Therefore, the result indicated that the respondents showed a low level of knowledge of Hepatitis.

Hypotheses Testing

Ho_1: There will be no significant difference on the knowledge of hepatitis virus among pregnant women in Akoko-South West Local Government area of Ondo state across age group.

Table 4: ANOVA analysis on difference of Age on the knowledge of Hepatitis B virus.

Groups	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	127.566	2	63.783	6.086	.003
Within Groups	3112.781	297	10.481		
Total	3240.347	299			

Source: Field Survey (2025)

Table 4 presented an ANOVA analysis of difference of age on the knowledge of Hepatitis among pregnant women in Akoko-South West Local Government Area. The table showed that there was significant difference on knowledge of hepatitis virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across age group ($F = 6.086$, $df = 299$, $p<0.05$). Therefore, the null hypothesis which stated that there will be no significant difference on knowledge of hepatitis virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across age group is rejected.

Table 5: Post Hoc analysis on difference of age on knowledge of Hepatitis among Pregnant Women

Age	N	Mean	Std. Deviation	Std. Error	95 % Confidence Interval for Mean Lower Bound	Upper Bound
18 – 23	40	32.0417	1.82921	.37339	31.2693	32.8141
24 – 30years	178	30.3073	3.37598	.24364	29.8267	30.7879
31years above	82	31.5238	3.21696	.35100	30.8257	32.2219
Total	300	30.7867	3.29200	.19006	30.4126	31.1607

Source: Field Survey, (2025)

Table 5 showed the Post hoc test results revealed that respondents between the age category of 24 - 30 years of age had significantly lower knowledge of Hepatitis ($x = 30.31$, $SD = 3.38$) compared to those below 18 - 23 years of age ($x = 32.04$, $SD = 1.82$) and 31 years and above ($x = 31.52$, $SD = 3.22$).

Ho_1: There will be no significant difference on the knowledge of hepatitis virus among pregnant women in Akoko-South West Local Government area of Ondo state across religion group.

Table 6: ANOVA analysis showing difference of religion on the knowledge of Hepatitis

Group	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	85.376	2	42.688	4.019	.019
Within Groups	3154.971	297	10.623		
Total	3240.347	299			

Source: Field Survey (2025)

Table 5 showed an ANOVA analysis on difference of religion on the knowledge of Hepatitis among pregnant women in Akoko-South West Local Government area of Ondo State. The table showed that there is significant difference of religion on the knowledge of pregnant women in pregnant women in Akoko-South West Local Government area of Ondo State ($F = 4.019$, $df = 299$, $p<0.05$). thus, the null hypothesis which stated that There will be no significant difference on knowledge of hepatitis

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202549

virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across religion group is rejected for this study.

Table 7: Post Hoc analysis on difference of religion on the knowledge of Hepatitis among Pregnant women.

Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound
Christianity	188	30.6743	3.21279	.21760	30.2454	31.1032
Muslim	84	30.7703	3.47810	.40432	29.9645	31.5761
traditional	28	34.0000	2.13809	.75593	32.2125	35.7875
Total	300	30.7867	3.29200	.19006	30.4126	31.1607

Source: Field Survey (2025)

Table 6 showed the Post hoc test results revealed that people who are traditional worshipers had significantly higher level of knowledge of induced abortion (x = 34.00, SD = 2.14) compared to Christians (x = 30.67, SD = 3.12) and Muslims (x = 30.77, SD = 3.45).

Discussion of Findings

The finding indicated that pregnant women in of hepatitis virus in Akoko-South West, Local Government area of Ondo state have low level of knowledge of Hepatitis B virus. This finding is in agreement with previous study conducted by Ajuwon, (2021), a study consisting of 400 pregnant women, the study shows that there is lack of knowledge, where only 99(24.8%) knew that hepatitis is a viral infection affecting the liver and 27(6.8%) pregnant thought it is an eye infection (Ajuwon, 2021). Furthermore, studies have shown that a proportion of expectant mothers from mostly endemic countries have suboptimal knowledge related to HBV infection and its transmission (Han,Yin et al, 2017). For example, 76% of pregnant women in Nigeria had inadequate HBV knowledge (Akindigh et al. 2019) and in a study from China, 20% of pregnant women were not aware that HBV can be transmitted from mother to infant (Hou et al., 2005).

The study also indicated that there is a significant difference on knowledge of hepatitis virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across age. In a previous study by Mohammed et al., (2020), it was observed that younger pregnant women (aged 18–25) often demonstrate lower awareness of hepatitis transmission, prevention, and complications compared to older pregnant women (aged 26–35). However, the current study showed a sharp contrast where younger women had higher knowledge compared to older pregnant women. This may be as a result of the fact that younger women of this study area are more exposed to learning opportunities compared to their older counter parts and access to mobile phone and its usage may have contributed to their knowledge of Hepatitis. However, in general, the respondents have low level of knowledge on Hepatitis. Conversely, some studies suggested that advanced maternal age (≥35 years) does not necessarily correlate with higher hepatitis knowledge. A cross-sectional study by El-Gilany and El-Fedawy (2018) revealed that while middle-aged pregnant women (26–34 years) had the highest hepatitis knowledge scores, older women (≥35 years) showed declining awareness, possibly due to outdated health beliefs or reduced engagement with newer health information.

The study also indicated that there is a significant difference in knowledge of hepatitis virus among attending healthcare clinic in Akoko-South West Local Government area of Ondo state across religious groups. For instance, a study by Ojo et al., (2021), showed that faith-based organizations often serve as trusted sources of health information, particularly in communities with limited access to formal healthcare systems. For instance, in Nigeria, religious leaders were found to disseminate health messages about hepatitis B prevention through sermons and community programs, leading to improved knowledge among pregnant women (Adebayo et al., 2020). In another vein, some religious beliefs may also perpetuate misconceptions, such as the notion that divine intervention alone can prevent hepatitis, thereby discouraging medical testing and vaccination (Yousafzai et al., 2019).

Conclusion

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202549

The study concluded that the level of knowledge of hepatitis virus among pregnant women attending health care clinic in Akoko southwest is low. Furthermore, Age and Religious groups showed significant difference on the knowledge of hepatitis among pregnant in Akoko South-west Local Government area of Ondo State, Nigeria.

Recommendations

Consequent upon the conclusion of the findings, the following recommendations were made;

1. Maternal knowledge is very important in the prevention of hepatitis B virus which could be done through government partnership with various health centers to organize symposia on the transmission routes, the importance of timely vaccination and screening, leverage on digital platform to propagate reliable information on Hepatitis B virus to pregnant women.
2. The government in conjunction with various healthcare facilities providers should provide free or cost-effective HBV screenings, vaccination, ensuring that investment is made in healthcare infrastructure to enhance diagnostic capabilities and support services for individual living with hepatitis B.
3. Religion leaders should also intensify and assists the government by inviting health care providers to disseminate health talks through seminars.

Acknowledgements

My appreciation goes to the experts in the department of human kinetics and health education with regards to their contribution to the success of this work especially in the area of validation of the research instrument. Furthermore, I also acknowledge the efforts of the two co-authors towards the completion of this work. Lastly, I am grateful to the respondents for their time in participating in this research and ensuring the successful completion of this study. All efforts are duly appreciated.

References

Adebayo, S. B., Oladimeji, K. E., & Adeoye, A. O. (2020). Role of religious leaders in promoting hepatitis B awareness among pregnant women in Southwest Nigeria. *Journal of Religion and Health*, 59(3), 1124-1135.

Ajuwon, G. J. (2021). Hepatitis B virus infection in Nigeria: a systematicreview and meta-analysis of data published between 2010 and 2019.

Akindigh, T. M., Joseph, A. O., Robert, C. O., Okojokwu, O. J., Okechalu, J.N. & Anejo-Okopi, J. A. (2019). Seroprevalence of hepatitis B virus co-infection among HIV-1-positive patients in North-Central Nigeria: The urgent need for surveillance. *Afr J Lab Med*.

Al-Ma'aitah, R., Al-Kloub, M., & Al-Rawashdeh, A. (2019). Knowledge and attitudes toward hepatitis B infection among pregnant women in Jordan. *Journal of Transcultural Nursing, 30*(3), 222–229.

Mkandawire, P., Richmond, C., Dixon, J., Luginaah, I.N. & Tobias, J. (2013). Hepatitis B in Ghana's upper west region: a hidden epidemic in need of national policy attention. Health & place

Mohammed, B. A., Abdulkadir, M. B., & Adeboye, M. A. (2020). Hepatitis B knowledge and vaccination status among pregnant women in Nigeria: A hospital-based study. *BMC Preg. and Childbirth, 20*(1), 1–8.

Moturi, E., Tevi-Benissan, C., Hagan, J., Shendale, S., Mayenga, D., & Murokora, D. (2018). Implementing a Birth Dose of Hepatitis B Vaccine in Africa: Findings from Assessments in 5 Countries. *J Immunol Sci.*

Musa, B. M., Bussell, S., Borodo, M. M., Samaila, A. A. & Femi, O. I. (2015). Prevalence of hepatitis B virus infection in Nigeria, 2000–2013: a systematic rev. and meta-analysis. *Niger J Clin Pract.* ;18(2):163–72.

Ojo, O. O., Adeyemo, W. L., & Ogunbodede, E. O. (2021). Religious organizations as health information hubs for pregnant women in Sub-Saharan Africa. *Journal of Community Health*, 46(4), 712-721.

Olatunde, B. O., Adeyinka, D. A., Ndukwe, C. D., Oladele, T. T., Yahaya H. B. & Ijaodola, O. A. (2021). Antenatal hepatitis B screening in Nigeria: A comparative analysis with syphilis and HIV. *Int J STD AIDS.*

Olokoba, A. B., Salawu, F. K., Danburam, A., Olokoba, L. B., Midala, J. K. (2011). Hepatitis B virus infection amongst pregnant women in North eastern Nigeria- a call for action. *Niger J Clin Pract* 14: 10 13

World Health Organization, (2019). Global hepatitis report 2017: web annex A: estimations of worldwide prevalence of chronic hepatitis B virus infection: a systematic review of data published between 1965 and 2017.

World Health Organization. (2021). Global hepatitis report 2021: Action for access in low- and middle-income countries.

Yang, J. D., Mohamed, E. A., Aziz, O. A., Shousha, H. I., Hashem, M. B. & Nabeel M.M. (2017). Characteristics, management, and outcomes of patients with hepatocellular carcinoma in Africa: a multicountry observational study from the Africa Liver Cancer Consortium. *Lancet Gastroenterol Hepatol.*

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202550

Influence of Insecurity on Relationship among Tertiary Education Students. A Case Study of Zamfara State College of Education, Maru, Zamfara State, Nigeria

BASHIRU, Abubakar[1]
Email: bbsadik01@gmail.com
Phone No: 07031022434

ABUBAKAR, Sadik Haruna
Email: asharuna@fugusau.edu.ng
Phone number: 07066994040

[1]Department of Educational Foundations, Federal University Gusau, Zamfara State, Nigeria

Abstract

This study investigated the influence of insecurity on Relationship among students of Zamfara State College of Education, Maru. The study employed descriptive survey design. The population of the study was 1,784 NCE II students of Zamfara State College of Education, Maru. A sample of 100 students were selected using purposive sampling technique. The Instrument used for data collection was the Insecurity and Students Relationship Questionnaire (ISRQ). The instrument was validated by the senior lecturers in the department of Educational Foundations. A reliability test was carried out on the instrument using Cronbach alpha reliability coefficient. The data collected was analyzed using descriptive statistics. A decision mean of 1.50 and above was adopted as an "Agreed" point. Three objectives and three Research Questions guided the study. The findings of the study revealed that Insecurity has negatively influence the cordial relationship among the students of Zamfara State College of Education, Maru. The study recommended that, both the state and federal Government should introduce a strong military tactics towards curtailing the, menace of insecurity in the state. Also, students should continue to care for one another, have confidence in one another and should not allow insecurity to disrupt interaction process among them.
Keywords: Insecurity, Relationships, Students

Introduction

Relationship to a large extent assists individuals in achieving their objectives in life. When students and teachers have good relationship in school, it has a capacity to encourage and fast track the academic work of the individual student/teacher. Relationship is more or less motivating factor for good success in academic environment. Ryan Wentzel, Baker, Brown, Davidson, Lafantanain Ladan (2016) asserted that when students enter school, they spent more time with their peers and less time with their family. To them, some degree of commitment in the relationship can lead to a type of modeling which can help them to develop some proactive behavior that can positively affect their school work. Through frequent interaction, they may share experiences that can encourage many positive results in their approach to schooling and school work itself (Adah 2017).

Erozkan (2011) asserted that an individual's ability to have close relationship with other people is one of the most important features of a healthy personality. Close relationship influences the personal social development process of people considerably. Attachment theory, proposes that the quality of one's closest relationship beginning in infancy set the stage for subsequent development. When these relationships are assured, they promote self-reliance, confident, exploration of the environment and resilience in dealing with life stresses and crises. Bowlby (2011). Lack of trust in a relationship can be expressed as an emotional response demonstrating a feeling of fear and despair. A constant expression of unworthiness and inability to trust people depicts symptoms of insecurity (Idowu, 2015). The existents constant threat to life and property of student in the school environment increases the state of lack of trust steadily and this to a large extent affects students one on one relationship. If further enlarge the scope of distance that exists among them continuously. According to Ani in Ladan (2016), the school colleges, universities, research centers, training institutions, companies, and so on, that are meant to be the paradise for human capital development are increasingly becoming insecure in the country.

It is noted that student ability to work together provides occasion for interaction and closer relationship. In the other hand, it provides the opportunity for them to share views and opinions as well as benefit from quality discussion and ideas of others. Relationship is a factor that has the capacity to facilitate positive help seeking behavior among students. But due to the current

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202550

situation of insecurity which is threatening every segment of the society especially institutions of learning in the country, it has become difficult for student to relate in such a way as to consolidate their academic activities, since people are living in suspicion of one another insecurity therefore, seems to be interfering with the positive relationship that supposed to exist among students.

Objectives of the study

The study was guided by the following objectives.

1. To assess the influence of insecurity of affection among the students.
2. To investigate the influence of insecurity on confidence among the student.
3. To assess the influence of insecurity on interaction among the student.

Research Questions

The following research question were raised for the study.

1. What is the influence of insecurity on affection among students in college of education, Maru?
2. What is the influence of insecurity on confidence among students in college of education, Maru?
3. What is the influence of insecurity on interaction among student in college of education, Maru methodology?

Methodology

The research design used for the study was descriptive survey design because of its ability to study both small and large population and provision of a wide variety of information about subjects or object of study in a relatively short time population and sample of the study. The population of the study comprises of NCE II students of Zamfara State College of Education Maru. The sample for the study comprised of one hundred students of the college. Purposive sampling was employed in sampling the one hundred students. The instrument used for data collection was the Insecurity and Student Relationship Questionnaire (ISRQ). The instrument was a structured questionnaire designed by the researcher. It was divided in to two sections. Section A considered the demographic variable of the respondents, while section B focused on other variables of the study which is comprised of three subscales of affection, confidence and interaction. The instrument was validated by senior lectures in the department of educational foundations. A reliability test was carried out on the instrument using Cronbach alpha reliability coefficient. Data was collected through the administration of the instrument to the respondents by the researcher with the aid of the research assistance and this made the data collection easy. All data collected was analyzed using descriptive statistics. A decision mean of 1.50 and above was adopted as an "Agreed" point. Therefore, any mean score that was not up to that was taken as "Disagree' point.

Presentation of Results

Research Question One: What is the Influence of Insecurity on Affection among Students?

Table 1: Showing Response of the Respondents on the Influence of Insecurity on Affection among Students.

s/no.	items	SA	A	DA	SDA	Mean	SD	Decision
1.	Students' affection for one is disrupted by insecurity	65	15	13	67	1.68	0.49	Agree
2.	It is becoming difficult for students to assist each other in time of need now	74	7	12	7	1.73	0.48	Agree
3.	There is great divide among students due to insecurity	71	7	15	7	1.70	0.49	Agree
4.	Initial affection that brings about deep concern for one another is gradually fading among students.	65	15	13	7	1.68	0.49	Agree
5.	Students do not want to involve themselves on each other's affair any more	33	17	32	18	1.32	0.56	Disagree

Decision mean 1.50

The table above revealed the responses of the respondents on the influence of insecurity on affection among students. They are in agreement that insecurity interferes with the affection that exists among than. The cumulative mean response of 1.68 is higher than the decision mean 1.50. The students specifically show concern on the fact that it is becoming difficult for them to assist each other in time of need now as this item attracted the highest mean response of 1.73 with details showing that 74 strongly agreed, 7 Agreed, 12 Disagreed, and the rest of 7 strongly Disagreed. In some view, they are of the belief that there is a great divide among students due to insecurity as this item had second highest mean response of 1.70 with details showing while 71 were strongly agreed, 7 agreed, 15 disagreed then the remaining 7 were strongly disagreed. It is observed that students' affection for one another has been affected by insecurity, as well as initial affection that bring about concern for one another's

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202550

situation is fading away. Also, students have been found not involving themselves in each other's affaires any more, as these items achieved means scores of 1.68 and 1.32 respectively. In summary, the respondents were in agreement that affection between students have been seriously affected by insecurity and this has made it difficult for students to assist each other in times of need, and it has also led to great divide among students.

Research Question two: What is the influence of insecurity on confidence among students?

Table 2: Showing the Responses of Respondents on the Influence of Insecurity on Confidence in one Another among Students.

s/no items	SA	A	DA	SDA	Mean	SD	Decision
1. The initial interdependence among students has disappeared	63	15	14	8	1.68	0.49	Agree
2. Intra group discussion is not as effective as it used to be among students	27	18	37	18	1.27	0.54	Disagree
3. Interpersonal visitations are not more active among students	63	15	14	8	1.68	0.49	Agree
4. No one wants to shoulder the responsibility of other people any more	27	18	37	18	1.27	0.54	Disagree
5. The usual act of solidarity is gradually disappearing among students	63	15	14	8	1.68	0.49	Agree

Decision mean 1.50

Table 2 above revealed the responses of respondents on influence of insecurity on confidence among students, they are in agreement that insecurity has affected confidence in one another among them. The cumulative mean response of 1.68 is higher than the decision mean of 1.50. They are of the belief that the initial interdependence among students has disappeared and interpersonal visitations are no more active, likewise act of solidarity is disappearing. As these items attracted the means response of 1.68 each with details showing 63 were in strong agreement, 15 Agreed, 14 Disagreed, and 7 strongly disagreed. In the same view the respondents are of the view that group discussion among students is no more effective as it uses to be, and no one wants to shoulder the responsibility of other people any more. These two items obtained the mean scores of 1.27 respectively, with details showing 27 were in strong agreement, 18 agreed, 37 disagreed and 18 were in strong disagreement. In summary respondents agreed with item 1, 3 and 5, while they disagreed with item 2 and 4 respectively.

Research Question three: what is the influence of insecurity on interaction among students?

Table 3: Responses of respondents on the influence of insecurity on interaction

s/no. items	SA	A	DA	SDA	Mean	SD	Decision
1. Students are not closely related to one another anymore.	63	15	14	8	1.67	0.49	Agree
2. Intra group discussion is not as effective as it used to be	27	18	37	18	1.27	0.53	Disagree
3. Exchange of ideas is now superficial	69	11	13	7	1.71	0.48	Agree
4. Interaction is no more encouraged	7	71	15	7	1.68	0.49	Agree
5. Students cannot effectively communicate	27	18	37	18	1.26	0.54	Disagree

Decision mean 1.50

Table 3 above revealed the responses of respondents on the influence of insecurity on interaction. They are in agreement that score 1.67 is higher than the decision mean of 1.50. They are also of the belief that exchange of ideas is now superficial and this item attracted the highest mean response of 1.71 with details showing that 69 of the respondents were I strong agreement, 11 agreed, 13 disagreed, and the remaining 7 strongly disagreed furthermore, they felt that interaction is no more encouraged among students, this item the second highest mean response of 1.68 with details showing that while 7 respondents were in strong agreement, 71 were in agreement, 15 disagreed and the rest 7 were in strong disagreement. In summary, the respondents critically pay attention to the poor state of cohesiveness and exchange of views among students now.

Discussion of findings

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202550

Insecurity constitutes a great deal of threat to both individual and national development. Education sector has had as fair share of its effects. Students' relationship is a vital ingredient for academic success and excellent. It is a building bridge for continuity in pursuit of educational objectives and achievement of academic aspiration. It endeavors to create a platform were affection, confidence and meaningful interaction could be established. The result of this study, has revealed vital issues that needs the attention of stakeholders in education especially counselling psychologists. Research question one provided evidence of then fact students affection has been grossly affected by insecurity. It is obvious that students are no more sharing their usual affection with one another. The usual concern for one another with which school is known of, is gradually fading away among college students.

Item 1, 2, 3, and 4 with mean scores of 1.68, 1.73, 1.70 and 1.68 respectively, have shown that students are no more showing concern for another, instead it is individualist approach to issues that is now common. Assistance for each other is not forthcoming and at the same time a great divide is now prevalence among the students due to suspicious behavior that have been adopted by most of them. Susan, Horton and Zhang in Ladan (2016) asserted that close relationships brings about the development of healthy personalities and interpersonal behaviors. To them, such relationships result to some benefits which include compassion, happiness, loving and feeling loved. According to Erozkan (2018) individual's ability to have close relationship with other people is one aspect of a healthy personality. To him, close relationship influence persona social development of individuals considerably. It is obvious here that this result does not agree with this assertion, because of the absence of affection and closeness among students. This would to a great extent affect student's commitment to one another, academic help seeking behavior, excellence and a better school outcome.

Research Question two results revealed a high level of the influence of insecurity on the confidence that students need to have on each other. The study produced evidence that confidence on each other is not very obvious among the students. Even where there is confidence, the indication is that it was low. By this result, it is evident that students do not exercise confidence on each other anymore due to fear, which has made them loose the sense of confidence in one another. Items 1, 3 and 5 with high mean scores indicate the degree of negative influence of insecurity on confidence. It goes a long way to demonstrate how absence of confidence can hinder cooperation, intimacy and interdependence that supposed to characterize students' academic endeavors.

Research Question three revealed high level of influence of intimacy among students. It further shows how insecurity has negatively influence interaction among them. The study showed how insecurity has the capacity to showdown interaction among students. Absence of interaction to such relationship can lead to lack of commitment to such relationship. Since insecurity has influenced interaction negatively, one can confidently say that students now lack commitment to relationship among themselves as a result of the influence of insecurity. This can be seen in items 1, 3 and 4 which carry the means scores of 1.67, 1.71 and 1.68 respectively. An all of which are higher than the decision mean of 1.50. According to Idris (2013), through constant interaction individuals can share experiences that can encourage many positive results in their approach to schooling and school work. The result of this study is not in consonance with this assertion, as it showed that interaction within students is actually very low as a result of negative influence of insecurity. This can go a long way to affect the help seeking behavior, cooperation and performance among students, as a result, the week ones may lack the confidence to approach their colleagues for assistance.

Conclusion

The study was aimed at finding out how insecurity affects the relationship among students. The importance of relationship with school level cannot be overemphasized. It facilitates communal engagements of students which eventually results to sharing of ideas, group work, and effective communication. Based on the result of this study, it was observed that students are now relenting in their effort of assisting one another in times of need as a result of the influence of insecurity. This culminates into avoidance behavior among students which may not be good enough for academic success. It was also observed that students do not have confidence in one another anymore due to effect of insecurity. Despite all these, it must be noted that effective relationship is central in enhancing upward movement of students' academic work and success.

Recommendations

The following recommendations were made:

1. Zamfara state government in conjunction with the federal government through the service chiefs particularly the chief of defense staff should introduce a strong military tactics towards curtailing the menace of insecurity in Zamfara state.
2. It is recommended that students should continue to care for one another despite the circumstances of insecurity.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202550

3. It is also recommended that students should not allow the situation of insecurity to undermine their confidence in one another.
4. It is recommended that students should not allow insecurity to disrupt interaction process among them, since this has a lot of implications on their academic wellbeing.
5. It is recommended that all and sundry should support the effort of the government. In addition, there is need for regular prayers from all for God's blessing in seeing the end of various ranges of insecurity in the country.

Reference

Adah R. (2017) Nigeria: Insecurity what hope for a common man? Retrieved from http://alafrica.com August 21st 2023.

Erozkan A. (2011) The attachment styles bases of loneliness and depression. International *Journal of Psychology and counselling Vol. 3(9), 186 – 193. Retrieved 29th July 2023*, from http://www.academicjournals.org/IJPC

Ladan, A.A. (2016) Influence of insecurity on Relationship among University Students. *Journal of Nigerian Society for Educational Psychologists. (NISEP), 9, 245-258*.

Balarabe, M. (2016) Relationship of positive coping strategy with stress among university medical students *Journal of Nigerian Society for Educational Psychologists, (NISEP), 7, 164-178.*

Idowu, T. (2015). How insecurity harms your relationship (part 1). Retrieved August 2023, from http://www.nairaland.com

Idris, M. (2013) Peace and Security in Nigeria: the role of Education, *Journal of Women in Colleges of Education, (17) 1, 107 -110.*

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202551

Effect of Peer-Tutoring Strategy on Performance in Basic Science Concepts among Secondary School Students in Zaria Education Zone, Kaduna State, Nigeria

MAMMAN, Grace
Gracyyakman@mail.com
08136990755

Department of Science Education, Ahmadu Bello University, Zaria

Abstract
This study examined the effect of peer-tutoring on academic performance of Junior Secondary School (JSS) students in Basic Science in Zaria Education Zone, Kaduna State, Nigeria. The study was guided by two objectives, two research questions, and two null hypotheses. A pre-test, post-test quasi-experimental design was employed, involving an experimental group taught using peer-tutoring strategy and a control group taught using conventional methods. The population comprised 18,508 students from 28 co-educational schools, with a sample of 125 students selected through purposive and simple random sampling techniques. The Basic Science Concepts Performance Test (BSCPT) was used as the instrument for data collection. The BSCPT was validated by two experts in science education, and its reliability was established at 0.81 using the Kuder-Richardson formula. Data analysis involved descriptive statistics (mean and standard deviation) and inferential statistics (independent sample t-test) at a 0.05 significance level. Findings revealed a significant difference in the academic performance of students taught using peer-tutoring, with a mean difference of 6.35 in favor of the experimental group. Additionally, no significant gender differences were observed in the performance of male and female students exposed to peer-tutoring, indicating its gender-friendly nature. The study concluded that, peer-tutoring significantly improves academic performance in Basic Science concepts and promotes collaborative learning. It was recommended that Basic Science teachers incorporate peer-tutoring into their instructional strategies, curriculum planners integrate it into the curriculum, and textbook authors include peer-tutoring methodologies to enhance student engagement and achievement.
Keywords; (Peer-tutoring, Basic Science, Academic Performance, Gender)

Introduction
The increasing demand for effective teaching strategies which addressed the diverse needs of students had garnered significant attention in educational research. Among the numerous instructional approaches, the peer-tutoring strategy emerged as a promising method for enhancing student performance and engagement. Peer tutoring, as described by Shubeck (2022), involved cooperative learning in which one student (the tutor) provides academic assistance to another (the tutee) under the guidance of their teacher. This strategy fosters collaboration, critical thinking, and mutual support, creating an interactive learning environment that benefits both the tutor and the tutee (Shubeck, 2022). Basic science education plays a pivotal role in equipping students with the foundational knowledge and skills required for technological advancement and problem-solving. Gbordzoe (2020) revealed that, students' academic performance in basic science subjects has been suboptimal, often attributed to teacher-centered instructional methods such as lectures and note dictation. These conventional strategies fail to actively engage learners, resulting in low interest and achievement levels. According to Okoye, (2017) this challenge highlights the need for student-centered approaches like peer tutoring, which would address these gaps by promoting active participation of students and improving conceptual understanding. Peer tutoring involves students teaching and learning from each other, with tutors and tutees collaborating to achieve academic goals. This strategy has been shown to enhance knowledge retention, critical thinking, and problem-solving skills, as noted by Okoye (2017).

Peer tutoring is in line with the goals of Nigeria's National Policy on Education (FRN, 2013), which emphasizes the need for innovative teaching methods that promote active learning and critical thinking. The strategy's emphasized on collaboration and mutual learning and particularly suited to addressing the challenges of students' disengagement and dwindling academic performance in Basic Science. According to Nardacchione and Peconio (2022), peer-tutoring strategy transforms classrooms into collaborative spaces where students construct knowledge together, enhancing their critical thinking and problem-solving abilities. This approach is particularly relevant in the Nigerian context, where resource constraints and large class sizes often hinder effective teaching and learning. Empirical evidence has consistently supported the efficacy of peer-tutoring strategy in enhancing students' academic performance across various subjects. Agu and Iwanger (2018) found that peer tutoring significantly improved the achievement of students with learning disabilities in basic science and technology. Similarly, studies

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202551

Shamija (2018) and Moliner, and Alegre (2020) reported that, peer tutoring strategy enhanced students' interest and achievement in mathematics and other subjects. These findings align with the findings of Thurston et al (2021) who asserted that peer tutoring facilitates both academic and social benefits of students through collaborative learning. Gender-related differences in academic performance remain a persistent issue in educational research. While some studies, such as those by Iheahurukawa, and Ugwu, (2024) and Okoye et al (2024), reported no significant gender disparities in academic achievement with peer-tutoring strategies, others, like Ezenwosu and Nworgu (2017) and Goulas et al (2024) observed a performance advantage for male students. Understanding these disparities is important for implementing peer-tutoring strategy effectively, ensuring that both male and female students learn equally. Therefore, this study examined the effect of peer-tutoring strategy on the academic performance of Junior Secondary School II students in Basic science concepts in Zaria Education Zone, Kaduna state, Nigeria. The persistent decline in students' performance in Basic Science was a major concern to key stakeholders in Nigerian education system. Despite the subject's critical role in equipping students with the skills and knowledge needed for scientific literacy, many students struggle to grasp its concepts. Traditional teaching methods, characterized by teacher-centered approaches, have been identified as a significant factor contributing to this challenge (Shamija, 2019). These methods often fail to engage students actively, leading to poor academic performance. Peer-tutoring has emerged as a promising strategy to address these issues, offering a learner-centered approach that encourages active participation and collaboration. However, its application in classrooms, particularly in Basic Science, remains underexplored. While studies such as those by Agu and Iwanger (2018); Ebute and Aende (2024) have highlighted the benefits of peer-tutoring in other subjects, there is limited evidence on its impact on Basic Science performance at the Upper Basic level. Understanding how peer-tutoring influences male and female students differently is essential for its effective implementation. Therefore, this study investigates the effectiveness of peer-tutoring teaching method on the performance of Junior Secondary School (II) students in Basic Science concepts, providing insights into its potential to improve learning outcomes and address existing challenges. Conventional teaching method, predominantly lecture-based and focused on rote memorization, have been widely criticized for their ineffectiveness in fostering deep understanding and maintaining students interest in challenging topics like ecology (Anderson, 2023; Jackson, 2022). The conventional method often fails to engage students actively, leading to superficial learning experiences and a lack of practical application of ecological concepts (Smith & Taylor, 2022; Ogunleye & Omotayo, 2022). Hence this consistence use of conventional method results to students' persistence failure in ecology concepts.

Objectives of the study:

The objectives of this study are to:

1. Determine the impact of Peer-tutoring Strategy on the academic performance of JSS students in Basic Science concepts.
2. Determine if Peer-tutoring Strategy will affect disparities among JSS students in their academic performances.

Research Questions:

The following research questions were formulated for this study:

1. How does peer-tutoring Strategy impact on the academic performance of JSS II students in Basic Science?
2. How does peer-tutoring strategy affect the gender disparities among JSS II students in their academic performances?

Hypotheses:

Based on the objectives and research questions stated, the following null hypotheses are formulated for testing at $\alpha \leq 0.05$ level of significance:

Ho_1: There is no significant difference between the mean academic performance scores of JSS II students taught Basic science concepts using Peer-tutoring Strategy and those taught using conventional method.

Ho_2: There is no significant difference between the mean academic performance scores of male and female JSS II students taught using Peer-tutoring Strategy.

Methodology

The study employed a pre-test, post-test quasi-experimental design, specifically the non-equivalent control group design. According to Best and Kahn (2014), a Quasi-Experimental Design is often used in classroom experiments and does not involve the random assignment of subjects. This study involved two groups: an experimental and a control group. The design included two groups; an experimental group exposed to the peer-tutoring strategy and a control group taught using conventional methods. Pre-tests and post-tests were administered to both groups to measure differences in academic performance. The population consisted of 18,508 JSS II students from 28 co-educational schools offering Basic Science in Zaria Education Zone, Kaduna state, Nigeria. A sample was selected using 125 students was selected using purposive and simple random sampling techniques. Intact classes were used to maintain the natural learning environment. The instruments included the Basic Science Concepts

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202551

Performance Test (BSCPT), developed to align with the Basic Science curriculum, and validated by experts in Science Education. The reliability coefficient of 0.81 was established using the Kuder-Richardson formula. The experimental group was taught using the peer-tutoring strategy, which involved students in pairs or small groups, where peers facilitated learning under the teachers' supervision. The control group were taught using conventional methods. Both groups were taught for a period of six weeks, where posttest was administered to the groups to determine the effect of the two instructional strategies on students' academic performance in Basic science concepts. Descriptive statistics (mean and standard deviation) were used to answer the research questions, while inferential statistics (Independent sample t-test) was used to test the null hypotheses at $P \leq 0.05$ level of significance.

Presentation of Results

Research Question 1

How does peer-tutoring Strategy impact on the academic performance of JSS II students in Basic Science?

Table 1: Mean and Standard Deviation Analysis for Experimental and Control Groups

Variable Name	N	Mean	Std. Deviation	Mean Difference
Experimental	65	35.67	1.21	6.35
Control	60	29.32	3.26	

Researcher's fieldwork

Table 1 shows that the mean difference exist between the mean academic performance scores of JSS II students taught Basic Science Concepts using Peer-tutoring strategy and their counterparts taught using Conventional method. The computed mean academic performance scores of students in the experimental and control groups are 35.67 and 29.32 respectively with a mean difference of 6.35 in favour of the experimental group. To find out whether significance difference exist or not, null hypothesis one was tested.

Research Question 2

How does peer-tutoring strategy affect the gender disparities among JSS II students in their academic performances?

Table 2: Mean and Standard Deviation Analysis for Experimental and Control Groups

Variable Name	N	Mean	Std. Deviation	Mean Difference
Experimental	33	40.22	6.03	-0.02
Control	32	40.24	5.97	

Researcher's fieldwork

Table 2 shows that there is no significant difference between the descriptive mean performance score of male and female JSS II students taught Basic science Concepts using Peer-tutoring strategy. The computed mean performance scores male and female students in the experimental and control groups are 40.22 and 40.24 respectively and a standard deviation of 6.03 and 5.79 with a mean difference of -0.02. This shows that both male and female students have the same level of mean performance when taught Basic science concepts using Peer-tutoring strategy. To find out whether significance difference exist or not, null hypothesis two was tested.

Hypothesis 1

There is no significant difference between the mean academic performance scores of JSS II students taught Basic science concepts using Peer-tutoring strategy and their counterparts taught using Conventional method. Null hypothesis was tested using independent sample t-test and the result is presented in Table 3 below:

Table 3: Provide a Simple Descriptive Title for the Table

Group	n	Mean	Std. Deviation	Mean Difference	df	t-computed	P	Decision
Experimental	**65**	**35.65**	**1.21**	**6.35**	**123**	**33.12**	**0.000**	**Significant**
Control	**66**	**29.32**	**3.26**					

Significant at $p \leq 0.05$ level

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202551

Table 3; Result of the independent t-test statistic shows that significance difference exist between the mean academic performance scores of Upper basic II students taught Basic science concepts using Peer-tutoring strategy and their counterparts taught using Conventional method. Reasons being that, the calculated p-value of 0.00 is lower than the 0.05 alpha level of significance and the computed t-value of 33.12 at degree of freedom of 123. The computed mean academic performance scores are 35.65 and 29.32 respectively with a mean difference of 6.35. Therefore, the null hypothesis which states that there is no significant difference between the mean academic performance scores of JSS II students taught Basic science concepts using Peer-tutoring strategy and their counterparts taught using Conventional method, is hereby rejected.

Hypothesis 2

There is no significant difference between the mean academic performance scores of male and female JSS II students taught Basic science concepts using Peer-tutoring strategy. Null hypothesis was tested using independent sample t-test and the result is presented in Table 4 below:

Table 4: Provide a Simple Descriptive Title for the Table

Group	n	Mean	Std. Deviation	Mean Difference	df	t-computed	P	Decision
Experimental	**33**	**40.22**	**6.03**			**-0.12**	**0.41**	**Not Significant**
				-0.02	**53**			
Control	**32**	**40.24**	**5.79**					

Not Significant at p ≤ 0.05 level

Table 4 shows that that the calculated p-value of 0.41 is greater than the 0.05 alpha level of significance with the computed t-value of -0.12 at degree of freedom of 53. The computed mean academic performance scores of Male and female JSS II students taught Basic science concepts using Peer-tutoring strategy are 40.22 and 40.24 respectively with a mean difference of -0.02. This shows that both male and female students have the same level of mean academic performance scores when taught Basic science concepts using Peer-tutoring strategy. Therefore, the null hypothesis which stated that there is no significant difference between the mean academic performance scores of male and female JSS II students taught Basic science concepts using Peer-tutoring strategy, is hereby accepted and retained.

Discussion of Findings

The result in Table 2 shows that students in the experimental group had a higher mean academic performance score than those in the control group. The difference was significant as indicated by the t-test analysis. This revealed that students taught Genetics concepts with peer-tutoring strategy had a significantly higher mean academic performance scores than those taught using Conventional Method. By implication, the peer-tutoring strategy was able to foster a significantly higher performance than the conventional Method. The significant difference implies rejection of null hypothesis and retaining alternate hypothesis. Therefore, null hypothesis that states that, there is no significant difference in the mean academic performance scores of Upper Basic II students taught Basic science concepts with Peer-tutoring strategy and their counterparts taught using Conventional method is rejected. The significant difference indicates that students in experimental group recorded the higher mean score than those in the control group. This finding of this study supports that of Agu and Iwanger (2018) which revealed that students exhibited significant improvements in performance as a result of treatment with Peer-tutoring strategy as compared to the conventional method. Similarly, studies Shamija (2018); Moliner, and Alegre (2020) reported that, peer tutoring strategy enhanced students' interest and achievement in mathematics and other subjects. The findings of this study also are in agreement with findings of Thurston, et al (2021) who asserted that effective use of peer tutoring strategy in teaching should be employed as it will enhance student's performance. It was revealed in Table 4 that no significant difference in the performance of male and female students when exposed to Peer-tutoring strategy. This showed that the use of Peer-tutoring strategy is gender inclusive in the academic performance of JSS II students in Basic Science. This is in consistence with the findings of Iheahurukawa, and Ugwu, (2024) and Okoye, et al (2024), who found no significant gender disparities in academic achievement with peer-tutoring strategies. The findings in this study is in disagreement with the findings of Ezenwosu and Nworgu (2017) and Goulas et al (2024) that had earlier observed academic performances advantages for males students over females.

Conclusion

The study established that the use of peer-tutoring strategy significantly improves the academic performance of JSS II students in Basic Science concepts. Peer-tutoring strategy promotes meaningful and concrete learning among Basic science students

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202551

as it allows room for interaction among students. Peer-tutoring strategy is gender-friendly as it boosts academic performance among both male and female students as it promotes collaboration, and improves social interactions among students.

Recommendations

1. Basic science teachers should incorporate peer-tutoring strategy into JSS pedagogy as it fosters active participation among students and enhance academic performance in Basic Science.
2. Curriculum planners should integrate activities that involve peer-tutoring strategy into the Basic Science curriculum to promote student-centered learning.
3. Textbook authors should include peer-tutoring methodologies to guide teachers and students.
4. The Federal and State Governments through the Ministries of Education should organize training and retraining workshops for Basic science teachers on the use of peer-tutoring strategy.
5. Professional Associations like the Science Teachers Association of Nigeria (STAN) and research centers such as Nigerian Educational and Research Development Council (NERDC) should incorporate v in their science curricular at secondary school level to encourage the use of the strategy among teachers. They should also organize workshops and seminars on how to use peer-tutoring strategy to teach specific Basic science.

References

Agu, P. A., & Iwanger, R. (2018). Effect of peer tutoring instructional strategy on achievement of Basic Science and Technology students with learning disabilities in Nasarawa State, Nigeria. *East African Scholars Journal of Education, Humanities and Literature, 1*(2), 47-54.

Ashlame, P., & Iwanger, R. (2018). Peer tutoring instructional strategy and its impact on students' academic performance. *East African Scholars Journal of Education, Humanities and Literature, 1*(2), 47-54.

Ayashagba, T. (2017). Effect of discussion method on students' interest and achievement in social studies in education zone 'B' of Benue State. Unpublished M.Ed. dissertation, Benue State University, Makurdi.

Ebute, E. M., & Aende, T. F. (2024). Effects of peer-tutoring strategy on Upper Basic Two students' interest and achievement in social studies. *International Academy Journal of Administration, Education and Society, 6*(3), 113-125.

Federal Republic of Nigeria (FRN). (2014). National policy on education (6th ed.). Lagos: NERDC Press.

Gbordzoe, L. (2020). Assessing the effect of mode of instruction on the academic performance of students in North Tongu District (Doctoral dissertation, University of Education, Winneba).

Goulas, S., Griselda, S., & Megalokonomou, R. (2024). Comparative advantage and gender gap in STEM. *Journal of Human Resources, 59*(6), 1937-1980.

Iheahurukawa, N. J., & Ugwu, A. N. (2024). Effect of peer-tutoring strategy on the academic achievement of secondary school students in electro chemistry in Imo state. *Irish journal of educational practice, 7*(1), 13-24.

Ishaya, E. (2014). Impact of instructional materials on students' achievement and interest in social studies at the upper basic education schools level in Obi local government area of Nassarawa State. Unpublished M.Ed. dissertation, Benue State University, Makurdi.

Moliner, L., & Alegre, F. (2020). Effects of peer tutoring on middle school students' mathematics self-concepts. *Plos one, 15*(4), e0231410.

Moreno, C., & Duran, D. (2002). *Frameworks: Cooperative and collaborative methods*. Barcelona, Spain: Edebe.

Nardacchione, G., & Peconio, G. (2022). Peer Tutoring and Scaffolding Principle for Inclusive Teaching. *Elementa. Intersections between Philosophy, Epistemology and Empirical Perspectives, 1*(1-2), 181-200.

National Teachers Institute. (2019). *Manual for the re-training of primary school teachers (Social Studies)*. Kaduna: NTI Press.

Okoye, A. A. (2017). Effect of peer-tutoring method on students' academic achievement in home economics. *Academic Journal of Interdisciplinary Studies, 2*(5), 193-197.

Okoye, C. C., Ikwuka, O. I., & Akudolu, L. R. (2024). Differential effect of peer tutoring and gender on secondary school students 'academic achievement in English language in Anambra state, Nigeria. *UNIZIK Journal of Educational Research and Policy Studies, 18*(1), 130-137.

Shamija, T. A. (2019). *Social studies education: An introductory text (Revised edition)*. Makurdi: Selfers Academic Press.

Shubeck, K. T. (2022). Student Prior Knowledge and Learning in an Intelligent Tutoring System: Comparing the Effectiveness of Vicarious and Interactive Dialogues. The University of Memphis.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202551

Thurston, A., Cockerill, M., & Chiang, T. H. (2021). Assessing the differential effects of peer tutoring for tutors and tutees. *Education Sciences, 11*(3), 97.

Whitman, N. A. (2012). *Peer teaching: To teach is to learn twice*. Washington, DC: ERIC Clearinghouse on Higher Education.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202555

Qualitative Study on Advancing Information Access: The Role of Information Retrieval Systems in Enhancing Digital User Experience

BADAMASI, Bukhari[1]
bbadamasi@abu.edu.ng, buhariruky@gmail.com
+2348036992294

GALADIMA, Yaaji[1]
fatimayaajigaladima@gmail.com
+2348032633457

ABDULKARIM, Jibril Muhammad[1]
abdulkarimjibrilm@gmail.com
+2348062296679

ALIYU, Jamila Umar[2]
jamilaaliyuumara@gmail.com
+2348035359305

UMAR, Ruqayya[3]
Rukayyahummar897@gmail.com
+2348033446026

HOSEA, Freedom[1]
Freedomhosea511@gmail.com
+2349028463044

[1]Ahmadu Bello University, Zaria, Kaduna State, Nigeria
[2]Federal University of Education, Zaria, Kaduna State, Nigeria
[3]Federal Polytechnic Kaduna

Abstract
Information retrieval (IR) systems have become a cornerstone of the digital age, fundamentally shaping how individuals access, manage, and engage with information online. This paper explores the evolving landscape of IR systems, focusing on their core components, operational challenges, and emerging trends that are redefining user experiences. It highlights key mechanisms such as semantic search, which enables systems to interpret user intent and context, and personalized search, which adapts results based on individual preferences and behavior. Furthermore, the paper examines the critical role of recommendation systems - used by platforms like Amazon and Netflix - which apply information retrieval techniques to offer context-aware, relevant suggestions through collaborative, content-based, and hybrid filtering approaches. By addressing challenges such as data heterogeneity, query ambiguity, and system scalability, and by leveraging advanced technologies like machine learning and natural language processing, modern IR systems are increasingly capable of delivering accurate, relevant, and personalized content. The study concludes by emphasizing the continued importance of IR systems in enabling seamless access to information and enhancing digital engagement in an increasingly data-driven world.
Keyword: *Information Retrieval Systems, Semantic Search, Personalized Search, and User Experience*

Introduction

An Information Retrieval System (IRS) is an integrated combination of software and hardware technologies designed to facilitate the efficient retrieval of relevant information from extensive repositories such as databases, digital libraries, document collections, and the World Wide Web. The fundamental objective of an IRS is to support users in locating information that

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202555

precisely aligns with their specific needs by systematically organizing, indexing, and managing data to enable fast and accurate search capabilities (Adomavicius et al., 2019).

In today's data-driven digital era, Information Retrieval Systems have become indispensable tools that underpin how individuals and organizations access, navigate, and utilize vast volumes of information. These systems are engineered not only to collect and store diverse data types but also to process complex user queries through sophisticated algorithms, ranking mechanisms, and semantic analysis to deliver highly relevant search results (Malhotra & Rishi, 2021). Given the exponential growth of digital content across fields such as academia, commerce, healthcare, and government, IRSs play a central role in transforming raw data into accessible knowledge, thereby enhancing decision-making, research productivity, and overall information literacy. As digital information ecosystems continue to expand, the evolution of IRS technologies remains critical to meeting user expectations for speed, accuracy, and contextual relevance in information retrieval.

Literature Review

Evolution of Information Retrieval Systems

The evolution of Information Retrieval Systems (IRS) reflects a dynamic journey from manual cataloging methods to intelligent, AI-driven search technologies. Historically, libraries relied on traditional card catalogs, bibliographies, and subject indexes to organize and retrieve physical materials using standardized classification schemes and controlled vocabularies (Joorabchi & Mahdi, 2013; Salaba & Chan, 2023). The emergence of computers in the mid-20th century marked the beginning of digital transformation, with early systems like IBM's Shoebox and the SMART Information Retrieval System pioneering automated retrieval through inverted indexes and relevance-based ranking. The 1970s and 1980s introduced online databases such as Dialog and MEDLINE, enabling remote access via terminal-based interfaces and significantly broadening the reach of indexed content. The advent of the World Wide Web in the 1990s revolutionized information retrieval with the development of powerful search engines like Archie, Veronica, AltaVista, and Google. These platforms utilized advanced algorithms, including PageRank and web crawling, to organize and deliver web-based information with unprecedented speed and accuracy. In parallel, domain-specific IRS platforms emerged to cater to the unique needs of academic research, legal practice, healthcare, and enterprise knowledge management, offering specialized search functionalities and metadata structures. This ongoing evolution reflects the persistent drive to improve the efficiency, relevance, and user-centeredness of information retrieval. As data volumes and complexity continue to grow, future advancements are likely to focus on integrating artificial intelligence, natural language processing, and personalized search experiences to meet increasingly sophisticated user expectations (Brennan et al., 2020; Joorabchi & Mahdi, 2013).

Components of Information Retrieval Systems

Modern Information Retrieval Systems comprise several interdependent components that function cohesively to enable efficient and accurate retrieval of information. At the forefront is the user interface, which facilitates interaction between the user and the system. It allows users to input search queries and view results through intuitive design elements such as search bars, filters, and advanced options. Features like autocomplete, spell correction, and query suggestions further enhance usability and search efficiency (Gupta et al., 2019; Simian & Șerban, 2024). Once a query is submitted, the query processor interprets and refines it, employing natural language processing, stemming, synonym recognition, and syntax adjustments to ensure compatibility with the system's indexing structure (Chowdhury, 2023; Wong et al., 2021). This processed query is then matched against a structured index, maintained by the indexer, which organizes data through techniques such as tokenization, stemming, and stop-word removal. The index serves as a roadmap for quickly locating relevant documents or data within vast repositories (Fenner et al., 2019). Finally, the ranking algorithm evaluates the retrieved content and assigns relevance scores based on factors such as term frequency, document structure, user engagement metrics, and contextual relevance. This ensures that the most pertinent results appear prominently in the search output, enhancing user satisfaction and discovery efficiency (Cleverley & Burnett, 2019). Together, these components form the backbone of modern IRS, ensuring that users can access precise and relevant information seamlessly and effectively.

Ranking Algorithms in Information Retrieval Systems

Information Retrieval Systems (IRS) employ a variety of ranking algorithms to ensure that search results are both relevant and contextually appropriate for user queries. One of the most influential algorithms is PageRank, developed by Google, which evaluates the importance of web pages based on the quantity and quality of backlinks they receive. Pages linked to by numerous authoritative sources are deemed more credible and are ranked higher in search results. Another widely used method is TF-IDF (Term Frequency-Inverse Document Frequency**)**, which assigns weight to terms based on their frequency within a document relative to their rarity across a larger collection. This helps identify terms that are most indicative of a document's relevance to

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202555

a given query. In more advanced systems, machine learning algorithms - such as neural networks, decision trees, and gradient boosting models - are leveraged to personalize and refine ranking by analyzing user behavior, intent, and past interactions. These algorithms continuously adapt and learn to deliver more accurate and personalized results. By integrating these diverse ranking techniques, IRS enhance the relevance, precision, and user satisfaction associated with the search experience.

Information Retrieval Models

Information retrieval models provide theoretical frameworks that guide how search systems interpret user queries and retrieve relevant content. Three foundational models dominate this field: the Boolean Model, the Vector Space Model, and the Probabilistic Model (Hug et al., 2023; Pasumarthi et al., 2019). The Boolean Model is based on classical set theory and uses logical operators - AND, OR, and NOT - to include or exclude documents containing specific terms. It enables precise matching and is particularly effective in structured data environments where users seek exact information matches. In contrast, the Vector Space Model represents both documents and queries as vectors in a multidimensional space, where each term corresponds to a dimension. Relevance is computed using cosine similarity, allowing for partial matching and term weighting, which improves retrieval flexibility and ranking quality (Guo et al., 2016). Finally, the Probabilistic Model estimates the likelihood that a given document is relevant to a user's query by evaluating term occurrences and document characteristics. Techniques like BM25 are used to weight terms based on their discriminative power, while relevance feedback mechanisms allow for iterative refinement of results based on user interactions. Unlike the Boolean and Vector models, the probabilistic approach incorporates uncertainty and dynamic learning, making it highly adaptable in modern search systems. Together, these models underpin the logic and effectiveness of contemporary IRS, allowing them to cater to various user preferences, data types, and search complexities.

Information Retrieval Techniques

Information retrieval systems rely on a variety of techniques to enhance the relevance, accuracy, and efficiency of their search capabilities, with text processing, query expansion, and relevance feedback forming core pillars of this process. Text processing techniques serve as the foundation by preparing raw text data for effective retrieval. Tokenization breaks down text into individual elements or tokens, enabling the system to analyze terms systematically. Stemming reduces words to their base or root forms - treating variations like "running," "runs," and "runner" as the single term "run" - thereby improving recall in search results. Additionally, stop-word removal eliminates commonly used but semantically insignificant words (e.g., "the," "is," "and") to focus processing resources on meaningful terms (Alshanik et al., 2020; Dragut et al., 2009). Building upon preprocessed text, query expansion techniques are employed to refine and enrich user queries, helping overcome vocabulary mismatches and broaden search scope. Methods such as synonym expansion, thesaurus-based term inclusion, and semantic enrichment through word embedding like Word2Vec or GloVe are used to identify and append conceptually related terms to the original query. These enhancements ensure that documents with relevant meaning but different wording are not overlooked (Thomas et al., 2017). Furthermore, relevance feedback mechanisms enable iterative refinement of search outcomes by learning from user interactions. Explicit feedback involves users directly labeling documents as relevant or not, while implicit feedback draws insights from behaviors such as clicks, dwell time, or navigation patterns. These inputs are used in a feedback loop that continuously adjusts the system's ranking algorithms to align more closely with user preferences. Collectively, these techniques contribute significantly to making modern information retrieval systems more adaptive, intuitive, and effective in meeting users' evolving information needs.

Challenges in Information Retrieval Systems

Information retrieval systems face a variety of challenges that impact their effectiveness and efficiency, particularly in dealing with heterogeneous data formats, ambiguity in user queries, and the need for scalability. One significant challenge lies in handling heterogeneous data, which includes diverse formats such as text, images, audio, and video. Each data type requires specialized feature extraction techniques - for instance, tokenization for text and convolutional neural networks (CNNs) for images. Additionally, multimodal search, where a single query spans multiple data types, necessitates advanced methods for integrating and aligning content across formats. Another issue, the semantic gap, arises from the disparity between low-level data features and high-level user concepts, making it difficult for systems to provide meaningful cross-format results (Aflalo et al., 2020). Another persistent challenge is ambiguity, which occurs when user queries are vague or contain polysemous terms (i.e., words with multiple meanings). Effective query understanding using natural language processing (NLP), word sense disambiguation, and contextual analysis is essential for interpreting user intent and improving search precision. Systems may also incorporate relevance feedback, allowing users to mark results as relevant or not, thereby refining subsequent search outputs and reducing the impact of ambiguity. A third critical issue is scalability, particularly as data volumes grow exponentially. Efficient indexing methods, such as distributed indexing systems, are necessary for rapid data retrieval.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202555

Moreover, query processing becomes more computationally intensive with large datasets, requiring techniques like parallel execution and distributed search algorithms. Resource management, including load balancing, data partitioning, and replica placement, is also vital for maintaining performance in large-scale systems (Malik et al., 2016). Addressing these interconnected challenges demands a blend of advanced algorithms, interdisciplinary processing techniques, and scalable infrastructures to ensure that modern information retrieval systems remain robust, accurate, and responsive to user needs in increasingly complex information environments (Thomas et al., 2017).

Metrics for Evaluating Information Retrieval Systems

Evaluating the effectiveness of information retrieval systems is crucial to ensure they deliver accurate and relevant results to users. Three fundamental metrics commonly used for this purpose are precision, recall, and the F1-score. Precision measures the accuracy of the retrieved results by calculating the proportion of relevant documents among all the retrieved documents. It is the ratio of true positives (correctly retrieved relevant documents) to the total retrieved documents, including false positives (incorrectly retrieved irrelevant documents). For example, if 80 out of 100 retrieved documents are relevant, the precision is 0.8 or 80%, indicating high retrieval accuracy. Recall, on the other hand, evaluates the completeness of the retrieval system by measuring the proportion of relevant documents retrieved out of all the actual relevant documents in the dataset. If a system correctly retrieves 80 out of 100 relevant documents, the recall is also 0.8 or 80%, reflecting its ability to retrieve most relevant content. The F1-score combines both precision and recall into a single metric, representing their harmonic mean and offering a balanced measure of the system's performance. For instance, if precision is 0.75 and recall is 0.60, the resulting F1-score would be approximately 0.67, highlighting a compromise between accuracy and completeness. Together, these three metrics provide a comprehensive assessment of an information retrieval system's effectiveness in delivering accurate and relevant results (Ioannakis et al., 2017).

In addition to these performance metrics, test collections such as those used in the Text Retrieval Conference (TREC) are critical for evaluating and benchmarking retrieval systems. These collections consist of standardized datasets, predefined queries, and relevance judgments, serving as a foundation for comparative analysis and experimental validation. They ensure standardized evaluation by providing a consistent dataset and criteria across different studies and systems, enabling ground truth assessment through relevance judgments. Furthermore, test collections support benchmarking performance, allowing researchers to measure their systems against established standards and historical results, which facilitates iterative improvements in algorithm design. They also promote community collaboration, creating a shared platform for testing and refining retrieval methods within the academic and professional communities. Finally, test collections enhance research reproducibility by enabling consistent replication of experiments, thereby strengthening the reliability and credibility of research outcomes. In conclusion, the combined use of performance metrics like precision, recall, and F1-score, along with robust test collections, provides a reliable framework for evaluating and improving information retrieval systems to meet users' information needs effectively (Hadizadeh et al., 2024).

Future Trends in Information Retrieval Systems

The future of information retrieval systems is being shaped by two major advancements: semantic search and personalized search. Semantic search represents a significant shift from traditional keyword-based approaches to systems that understand the meaning, context, and intent behind user queries. This evolution is driven by the integration of natural language processing (NLP) and machine learning technologies, which enable search engines to interpret user intent more accurately. By analyzing linguistic context and the relationships between terms, semantic search systems provide more precise and relevant results. These systems also consider user-specific factors - such as location, search history, and intent - to enhance contextual relevance, making the search experience more personalized and accurate. Moreover, semantic search improves natural language understanding, bridging the gap between how users phrase their questions and how systems retrieve results. Key technologies like entity recognition and knowledge graphs (e.g., Google's Knowledge Graph or Wikidata) allow systems to extract and organize structured information from unstructured data sources, enriching search results with meaningful connections and comprehensive insights. Ultimately, semantic search delivers a more intuitive, accurate, and satisfying user experience by deeply understanding information needs beyond surface-level keywords.

In parallel, the rise of personalized search is revolutionizing how users interact with information retrieval systems. Personalization involves tailoring search results to individual users based on their preferences, behavior, and demographics. Through user profiling and behavior analysis, systems analyze data such as past searches, click patterns, and browsing history to generate customized search experiences. Contextual understanding also plays a crucial role, allowing systems to adapt results based on factors like time of day, user device, and geographic location. Furthermore, recommendation systems are being

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202555

increasingly integrated, suggesting content that aligns with a user's interests, thereby enhancing engagement and satisfaction. By capturing implicit feedback - such as clicks, time spent on pages, and interactions - these systems continuously learn and refine their recommendations to improve relevance. However, personalized search also aims to maintain a balance between relevance and diversity to avoid filter bubbles, ensuring users are exposed to new and varied content. Together, semantic and personalized search mark a new era in information retrieval, where systems are more intelligent, user-centric, and capable of delivering deeply relevant, context-aware, and engaging search results (Adelakun, 2024).

Conclusion

Information retrieval systems are foundational to the functioning of the modern digital ecosystem, playing a critical role in how users search for, access, and interact with vast amounts of information online. These systems go beyond simple keyword matching to incorporate sophisticated techniques such as semantic search, which understands the context and intent behind user queries, and personalized search, which adapts results based on individual behaviors and preferences. Additionally, recommendation systems - integral to platforms like Amazon, Netflix, and YouTube - demonstrate the practical application of information retrieval by analyzing user data through collaborative filtering, content-based filtering, and hybrid models to deliver tailored and context-aware suggestions. These capabilities not only enhance user satisfaction and engagement but also ensure more relevant, timely, and accurate information delivery. As technology continues to evolve, information retrieval systems are expected to become even more intelligent and adaptive, leveraging advancements in natural language processing, machine learning, and data analytics to further refine the precision, relevance, and personalization of digital experiences. Ultimately, these systems form the invisible yet powerful infrastructure that underpins seamless information access, decision-making, and knowledge discovery in the digital age.

Recommendations

Recommendation systems are integral to modern digital platforms such as Amazon, Netflix, and Spotify, where they enhance user experience by delivering personalized content or product suggestions. These systems rely heavily on information retrieval techniques to analyze data, identify patterns, and generate relevant recommendations that align with user preferences. One of the foundational approaches is collaborative filtering, which analyzes the behaviors, preferences, and interactions of users to identify similarities and suggest items that users with similar tastes have engaged with. This technique leverages collective user data to deliver personalized suggestions and foster user satisfaction. Another key approach is content-based filtering, which focuses on recommending items based on the characteristics or attributes of products and the user's previous interactions. By analyzing features such as product descriptions, genres, tags, or metadata, this method tailors recommendations to match an individual's specific interests and tastes.

To enhance effectiveness, many platforms implement hybrid recommendation systems, which combine collaborative and content-based filtering techniques. This integrated approach compensates for the limitations of each method and produces more accurate, diverse, and reliable recommendations. For instance, while collaborative filtering may struggle with new users or products (the cold-start problem), content-based techniques can provide alternatives by focusing on item attributes. Additionally, context-aware recommendation systems have emerged as a powerful evolution in this space. These systems consider contextual factors such as the user's current location, device, time of day, or browsing session to generate more relevant and situationally appropriate suggestions. By dynamically adapting to the user's environment and behavior in real time, context-aware systems significantly enhance engagement and the perceived value of recommendations.

Overall, recommendation systems represent a practical application of information retrieval principles, combining user data analysis, content understanding, and contextual awareness to deliver a personalized and engaging digital experience. These systems not only improve usability and satisfaction but also drive user retention and commercial success for platforms that implement them effectively.

References

Adelakun, N. O. (2024). Exploring the Impact of Artificial Intelligence on Information Retrieval Systems. *Information Matters*, *4*(5).

Adomavicius, G., Bockstedt, J. C., Curley, S. P., & Zhang, J. (2019). Reducing Recommender System Biases. *MIS Quarterly*, *43*(4), 1321-A1313.

Aflalo, T., Zhang, C., Rosario, E., Pouratian, N., Orban, G., & Andersen, R. (2020). A shared neural substrate for action verbs and observed actions in human posterior parietal cortex. *Science advances*, *6*(43), eabb3984.

Alshanik, F., Apon, A., Herzog, A., Safro, I., & Sybrandt, J. (2020). Accelerating text mining using domain-specific stop word lists. 2020 IEEE international conference on big data (big data),

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202555

Brennan, K., Martin, K., FitzGerald, S., O'sullivan, J., Wu, Y., Blanco, A., Richardson, C., & Mc Gee, M. (2020). A comparison of methods for the isolation and separation of extracellular vesicles from protein and lipid particles in human serum. *Scientific reports*, *10*(1), 1039.

Chowdhury, S. (2023). *Semantic Search on Equipment* University of South-Eastern Norway].

Cleverley, P. H., & Burnett, S. (2019). Enterprise search and discovery capability: the factors and generative mechanisms for user satisfaction. *Journal of information science*, *45*(1), 29-52.

Dragut, E., Fang, F., Sistla, P., Yu, C., & Meng, W. (2009). Stop word and related problems in web interface integration. *Proceedings of the VLDB Endowment*, *2*(1), 349-360.

Fenner, M., Crosas, M., Grethe, J. S., Kennedy, D., Hermjakob, H., Rocca-Serra, P., Durand, G., Berjon, R., Karcher, S., & Martone, M. (2019). A data citation roadmap for scholarly data repositories. *Scientific data*, *6*(1), 28.

Guo, J., Fan, Y., Ai, Q., & Croft, W. B. (2016). A deep relevance matching model for ad-hoc retrieval. Proceedings of the 25th ACM international on conference on information and knowledge management,

Gupta, J., Qin, Z., Bendersky, M., & Metzler, D. (2019). Personalized online spell correction for personal search. The World Wide Web Conference,

Hadizadeh, Z., Nazari, A., & Mansoorizadeh, M. (2024). Enhancing Suggestion Detection in Online User Reviews through Integrated Information Retrieval and Deep Learning Approaches. *Journal of Web Engineering*, *23*(3), 431-463.

Hug, D., Last, G., & Weil, W. (2023). Boolean models. *arXiv preprint arXiv:2308.05861*.

Ioannakis, G., Koutsoudis, A., Pratikakis, I., & Chamzas, C. (2017). RETRIEVAL—an online performance evaluation tool for information retrieval methods. *IEEE Transactions on Multimedia*, *20*(1), 119-127.

Joorabchi, A., & Mahdi, A. (2013). Classification of scientific publications according to library controlled vocabularies: A new concept matching-based approach. *Library Hi Tech*, *31*(4), 725-747.

Malhotra, D., & Rishi, O. (2021). An intelligent approach to design of E-Commerce metasearch and ranking system using next-generation big data analytics. *Journal of King Saud University-Computer and Information Sciences*, *33*(2), 183-194.

Malik, S. U. R., Khan, S. U., Ewen, S. J., Tziritas, N., Kolodziej, J., Zomaya, A. Y., Madani, S. A., Min-Allah, N., Wang, L., & Xu, C.-Z. (2016). Performance analysis of data intensive cloud systems based on data management and replication: a survey. *Distributed and Parallel Databases*, *34*, 179-215.

Pasumarthi, R. K., Bruch, S., Wang, X., Li, C., Bendersky, M., Najork, M., Pfeifer, J., Golbandi, N., Anil, R., & Wolf, S. (2019). Tf-ranking: Scalable tensorflow library for learning-to-rank. Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining,

Salaba, A., & Chan, L. M. (2023). *Cataloging and classification: an introduction*. Rowman & Littlefield.

Simian, D., & Șerban, M.-E. (2024). Improving Search Query Accuracy for Specialized Websites Through Intelligent Text Correction and Reconstruction Models. *Information*, *15*(11), 683.

Thomas, R., Abell, B., Webb, H. J., Avdagic, E., & Zimmer-Gembeck, M. J. (2017). Parent-child interaction therapy: A meta-analysis. *Pediatrics*, *140*(3).

Wong, A., Joiner, D., Chiu, C., Elsayed, M., Pereira, K., Khmelevsky, Y., & Mahony, J. (2021). A survey of natural language processing implementation for data query systems. 2021 IEEE International Conference on Recent Advances in Systems Science and Engineering (RASSE),

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202556

Effect of Blended Instructional Strategy on Achievement and Misconceptions in Mathematics Concepts among Secondary School Students in Sokoto State, Nigeria

BELLO, Jafar Aliyu[1]
jeffrimthez@gmail.com,
07033334694

MOYI, Hamza[1]
moyihamza@gmail.com,
08136428559

GINGA, U. A.[2]
uaginga2@yahoo.com,
08069191276

[1]National Commission for Colleges of Education, Abuja
[2]Department of Science Education, Ahmadu Bello University, Zaria

Abstract
This study investigated the Effect of Blended instructional strategy on Achievement and Misconceptions in Mathematics concepts among secondary school students in Sokoto State, Nigeria. A non-randomized control group, pretest-posttest quasi-experimental design was employed. The study sampled 383 SS2 students proportionately from the population of public senior secondary school two (II) students during the 2024/2025 academic session in Sokoto Metropolis using stratified random sampling technique based on Krejcie-Morgan Table. The instruments were validated, pilot tested and reliability coefficients of 0.80 and 0.91 were obtained, respectively, using split-half. Data were collected using the Mathematical Achievement Test (MAT) and 5-Tier Mathematics Misconception Diagnostic Test (5-Tier MMDT). The experimental group were taught mathematical content domains using blended learning strategy, while the control group received treatment through conventional method. Descriptive and inferential statistics of mean, standard deviation, and independent samples t-test, were used to analyze the data. Therefore, the findings of this study reveal that the blended learning strategy significantly improved SS2 students' achievement in mathematical content domains compared to the conventional method. It also significantly reduced students' misconceptions in mathematical content domains. Moreover, the significant differences in both achievement and misconception levels between students taught using blended learning and those taught using conventional methods highlight the potential of blended learning as an effective instructional approach for mathematics education. The findings suggest that integrating technology into mathematics instruction can enhance student learning outcomes and provide a more meaningful and personalized learning experience.

***Keywords**: Blended learning, Mathematical Content Domains, Achievement, Misconception.*

Introduction
Mathematics is very important for scientific and technological progress, but many students find it difficult to understand because of ineffective teaching methods (Hansson, 2020). Traditional ways of teaching have been linked to students' misunderstandings and poor academic performance (Keykha & Heidarzadegan, 2016). Blended Learning (BL) is a teaching method that combines regular classroom teaching with online materials, creating a more interactive and flexible way of learning (Kumar, Krishnamurthi, Bhatia, Kaushik, Ahuja, Nayyar & Masud, 2021). Blended learning is used in many countries and has been proven to improve students' interest, thinking skills, and understanding of mathematical concepts (Boelens, De Wever & Voet, 2017). Studies from the United States and Finland show that combining digital tools with classroom lessons helps students remember information better and solve problems more effectively (Ojala, 2017; Collins & Halverson, 2018). The Organization for Economic Co-operation and Development (OECD) also supports using digital learning to meet students' different learning needs (OECD, 2021). In Africa, blended learning is becoming more common to help overcome educational challenges. Research from South Africa shows that using both face-to-face teaching and online platforms increases students' participation and performance in mathematics (Ngampornchai & Adams, 2016). Similarly, Kenya and Ghana have introduced digital tools to support mathematics education and address weaknesses in traditional

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202556

teaching (Luneta, 2022). However, a lack of digital resources and teacher training makes full implementation difficult. In Nigeria, blended learning is gradually being introduced, especially in universities and secondary schools. The Federal Ministry of Education recognizes the benefits of digital learning and is working to include it in school programs (FME, 2022). Research by Yusuf and Afolabi (2020) shows that Nigerian students taught through blended learning perform better in mathematics than those taught using only traditional methods. However, limited internet access, insufficient funding, and teachers' reluctance to use digital tools have slowed its widespread adoption. In Sokoto State, blended learning is still new in mathematics education. Although some schools have started using digital tools, most still rely on traditional methods due to infrastructure problems and a lack of teacher training. Research in northern Nigeria suggests that blended learning can help students correct misunderstandings and improve their mathematics skills (Adeyemi, 2024).). However, proper planning, teacher training, and better resources are needed to maximize its benefits. According to the West African Examinations Council (WAEC) Chief Examiners' reports, many students in Sokoto State struggle with mathematics, leading to a high failure rate. The reports highlight common mistakes, such as difficulties in solving algebraic equations, poor understanding of set theory, and inability to apply mathematical concepts to real-life problems. These challenges are largely due to the traditional teaching approach, which does not encourage active student participation or conceptual understanding. Although blended learning has been successful in many places, its use in Sokoto State is still very limited. Many students continue to struggle with mathematics because schools mainly use traditional teaching methods (Nasamu, 2021). There is a need to study how effective blended learning is in improving students' understanding and correcting their misconceptions in mathematics.

Aim and Objectives of the Study

This research aims to examine the Effect of Blended instructional strategy on Achievement and Misconceptions in Mathematics concepts among secondary school students in Sokoto State, Nigeria. Specifically, this study aims to:

1. Determine the effectiveness of the blended learning strategy in improving SS2 students' achievement in mathematical content domains.
2. Assess the impact of blended learning strategy on students' misconception in learning mathematical content domains.
3. Compare the achievement and misconceptions levels of students taught with blended learning strategy and those taught with conventional methods.

Research Questions

Based on the stated objectives, the study raised the following questions and hypotheses;

1. What is the mean achievement scores of students taught mathematical concept using blended instructional strategy and those exposed to lecture method in Sokoto State?
2. What is the level of misconceptions of students taught mathematical concept using blended instructional strategy and those exposed to lecture method in Sokoto State?
3. What is the difference in mathematical content domains achievement and misconception level between SS2 students taught using blended learning strategy and those taught using conventional method?

Hypothesis

The study formulated the following hypotheses;

1. There is no significant difference in mathematical content domains achievement between SS2 students taught using blended learning strategy and those taught using conventional method.
2. There is no significant difference in the misconception level between SS2 students taught using blended learning strategy and those taught using conventional method.
3. There is no significant difference in mathematical content domains achievement and misconception level between SS2 students taught using blended learning strategy and those taught using conventional method.

Methodology

The study adopted a non-randomized control group, pretest posttest quasi-experimental design. The experimental group was taught mathematical content domains using blended learning strategy, while the control group received instruction through conventional teaching method. The population consists of all SS2 students in public senior secondary schools in Sokoto Metropolis, with a total of 76,660 students across four Local Government Education Authorities (LGEAs), as shown in Table 1.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202556

Table 1: Population of the Study

S/N	Local Government Education Authorities	No. of Schools	Population
1	Sokoto North	**12**	16,447
2	Sokoto South	**18**	51,882
3	Wamakko	**10**	6,782
4	Dange-Shuni	**2**	1,549
	Total	**42**	**76,660**

Source: Ministry for Basic and Secondary Education Sokoto State (2024)

Table 1 presents a proportionate distribution of the sample from the population of 76,660 was used to generate a sample of 383 students, presented in Table 2, using stratified sampling technique across the LGEAs. The selection of this sample size is based on Kreijcie-Morgan Table.

Table 2: Sample and Sampling Techniques

S/N	LGEA	No. of Students
1	Sokoto North	82
2	Sokoto South	259
3	Wamakko	34
4	Dange-Shuni	8
	Total	**383**

The instruments used in the data collection include; Mathematical Achievement Test (MAT): A structured test covering key topics in mathematical content domains relevant to SS2 students, and 5-Tier Mathematics Misconception Diagnostic Test (5-Tier MMDT): To identify and measure common misconceptions students hold in mathematical content domains. Both instruments were validated by mathematics education experts to ensure reliability and content relevance. The reliability coefficients of 0.80 and 0.91 were obtained. The study was conducted for a period of six weeks, beginning with a pre-test to assess students' baseline knowledge and misconception. The experimental group received instruction via BL, incorporating digital resources, while the control group was taught using conventional method. After the intervention, a post-test was administered to evaluate achievement and misconceptions levels. Data were analyzed using descriptive and inferential statistics, including mean, standard deviation, and t-tests, to determine the significance of differences between groups. The data collected through the Mathematical Achievement Test (MAT) and the 5-Tier Mathematics Misconception Diagnostic Test (5-Tier MMDT) are presented here.

Presentation of Results

This section presents the results obtained in order to answer the research questions and analyse the hypotheses.

Research Question 1: What are the mean achievement scores of students taught mathematical concept using blended instructional strategy and those exposed to lecture method in Sokoto State? To answer this question, the mean and standard deviation of students' pre-test and post-test scores were calculated for both the experimental (blended learning) and control (conventional) groups. The results are presented in Table 3.

Table 3: Mean and Standard Deviation of Students' Achievement Scores in the experimental and control groups Pretest and post-test were compared.

Group	N	Pretest	Posttest	Mean Gain
Experimental (BL)	192	23.45 (5.21)	76.89 (6.45)	53.44
Control (CM)	191	23.67 (5.15)	54.32 (7.02)	30.65
Total	**383**			

From Table 3, students taught using the blended learning strategy had a mean achievement gain of 53.44, while those taught using the conventional method had a mean achievement gain of 30.65. This suggests that the blended learning strategy was more effective in improving students' achievement.

Research Question 2: What is the level of misconceptions of students taught mathematical concept using blended instructional strategy and those exposed to lecture method in Sokoto State? To answer this question, the mean and standard deviation of students' misconception scores were computed before and after the intervention. The results are presented in Table 4.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202556

Table 4: Mean and Standard Deviation of Students' Misconception Scores in the experimental and control groups Pretest and post-test were compared.

Group	N	Pretest	Posttest	Mean Reduction
Experimental (BL)	192	62.34 (7.89)	24.21 (5.67)	38.13
Control (CM)	191	61.98 (7.76)	43.56 (6.84)	18.42
Total	**383**			

From Table 4, students taught using the blended learning strategy showed a greater reduction in misconceptions (mean reduction = 38.13) compared to those taught using the conventional method (mean reduction = 18.42). This indicates that the blended learning strategy was more effective in addressing misconceptions in mathematical content domains.

Research Question 3: What is the difference in mathematical content domains achievement and misconception level between SS2 students taught using blended learning strategy and those taught using conventional method? To answer this question, an independent sample t-test was conducted to compare the post-test achievement and misconception scores of students in both groups. The results are presented in Table 5.

Table 5: Means and Standard Deviations on students Achievement and Misconception

Variables	Group	N	Mean	S.D	Mean gain
Achievement	Experimental	192	76.89	6.45	53.44
	Control	191	54.32	7.02	30.65
Misconception	Experimental	192	24.21	5.67	38.13
	Control	191	43.56	6.84	18.42

Table 5 shows the Means and Standard Deviations on students Achievement and Misconception. Students taught using the blended learning strategy had a mean achievement of (M=76.89, SD=6.45), while those taught using the conventional method had a mean achievement of (M=54.32, SD=7.02). This suggests that the blended learning strategy was more effective in improving students' achievement. Again, students taught using the blended learning strategy showed a mean misconception of (M=24.21, SD=5.67) compared to those taught using the conventional method having (M=43.56, SD=6.84). This indicates that the blended learning strategy was more effective in addressing misconceptions in mathematical content domains. Furthermore, independent sample t-test was used to test the hypotheses at $\propto= 0.05$ level of significance.

Hypothesis One: There is no significant difference in the mean achievement scores of students taught mathematical concept using blended instructional strategy and those exposed to lecture method in Sokoto State. The result of the analysis is presented in Table 6.

Table 6: Summary of Independent sample t-test on students achievement

Group	N	Mean	S.D	t-value	p-value	Decision
Experimental	192	76.89	6.45	12.67	0.000	Sig.
Control	191	54.32	7.02			

Table 6 presents the independent sample t-test results on students achievement which shows $t(381) = 12.67, p = 0.001$ is less than $\propto= 0.05$, leading to the rejection of $H0_1$. This confirms that the blended learning strategy significantly improved students' achievement.

Hypothesis Two: There is no significant difference in the misconceptions level of SS2 students in learning mathematical content domains when taught using the blended learning strategy and those taught using conventional methods. The result of the analysis is presented in Table 7.

Table 7: Summary of Independent sample t-test on students' misconception

Group	N	Mean	S.D	t-value	p-value	Decision
Experimental	192	24.21	5.67	10.43	0.000	Sig.
Control	191	43.56	6.84			

From Table 7, the students misconception result shows that $t(381) = 10.43,\ p = 0.001)$, which is less than $\propto= 0.05$ value leading to the rejection of $H0_2$. This suggests that the blended learning strategy significantly reduced students' misconceptions compared to the conventional method.

Hypothesis Three: There is no significant difference between the achievement and misconceptions levels of students taught with the blended learning strategy and those taught using conventional methods. The result of the analysis is presented in Table 8.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202556

Table 8: Summary of Independent sample t-test on students' achievement and misconception

Variables	Group	N	Mean	S.D	t-value	p-value	Decision
Achievement	Experimental	192	76.89	6.45	12.67	0.000	Sig.
	Control	191	54.32	7.02			
Misconception	Experimental	192	24.21	5.67	10.43	0.000	Sig.
	Control	191	43.56	6.84			

Table 8 presents the independent sample t-test results on students achievement which shows $t(381) = 12.67, p = 0.001$ is less than $\propto = 0.05$, leading to the rejection of $H0_1$. This confirms that the blended learning strategy significantly improved students' achievement. Also, the students misconception result shows that $t(381) = 10.43,\ p = 0.001)$, which is less than $\propto = 0.05$ value leading to the rejection of $H0_2$. This suggests that the blended learning strategy significantly reduced students' misconceptions compared to the conventional method.

Summary of Findings

1. There is a significant difference in the mean achievement scores of students taught mathematical concept using blended instructional strategy and those exposed to lecture method in Sokoto State.
2. There is a significant difference in the misconception levels of SS2 students in learning mathematical content domains when taught using the blended learning strategy and those taught using conventional methods.
3. There is a significant difference in the achievement and misconceptions levels of SS2 students in learning mathematical content domains when taught using the blended learning strategy and those taught using conventional methods.

Discussion of Findings

The findings of this study align with previous research that supports the effectiveness of blended learning strategies in enhancing students' achievement and reducing misconceptions in mathematics. The significant improvement in achievement and the reduction of misconceptions suggest that blended learning offers an interactive and engaging learning experience that strengthens students' understanding of mathematical concepts. The results also support constructivist learning theories, which emphasize active participation and student-centered learning approaches. The blended learning strategy provided opportunities for self-paced learning and access to digital resources, which helped students grasp abstract concepts more effectively. Unlike conventional methods that rely primarily on teacher-centered instruction, blended learning integrates both face-to-face teaching and online instructional materials, allowing students to review lessons at their own pace. This flexibility enhances retention and comprehension, particularly in complex topics such as geometry and algebra. Additionally, the use of multimedia resources, simulations, and interactive exercises in blended learning fosters a deeper conceptual understanding by accommodating different learning styles. Furthermore, the reduction in students' misconceptions highlights the role of blended learning in addressing persistent misunderstandings in mathematical content domains. By offering multiple representations of concepts such as visual models, real-life applications, and step-by-step problem-solving, blended learning helps students identify and correct their misconceptions. This finding aligns with research suggesting that traditional instructional methods may not always effectively address students' pre-existing misconceptions, whereas blended learning strategies promote critical thinking and conceptual clarity.

The study's findings also corroborate Vygotsky's Social Constructivism Theory, which emphasizes the importance of social interactions and scaffolding in the learning process. The blended learning strategy facilitated collaborative discussions, peer engagement, and teacher support, all of which contributed to improved mathematical reasoning. The integration of online discussions, quizzes, and real-time feedback allowed students to assess their understanding and correct errors promptly, reinforcing knowledge acquisition. Moreover, the significant difference found between students taught using blended learning and those taught with conventional methods further underscores the need for adopting innovative teaching strategies in secondary education. The conventional method, often characterized by rote learning and passive reception of information, may not be sufficient to develop students' higher-order thinking skills. In contrast, blended learning promotes active engagement, problem-solving skills, and autonomy in learning, which are crucial for academic success in mathematics. Therefore, the findings of this study reveal that the blended learning strategy significantly improved SS2 students' achievement in mathematical content domains compared to the conventional method. It also significantly reduced students' misconceptions in mathematical content domains. Moreover, the significant differences in both achievement and misconception levels between students taught using blended learning and those taught using conventional methods highlight the potential of blended learning as an effective instructional approach for mathematics education. These findings suggest

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202556

that integrating technology into mathematics instruction can enhance student learning outcomes and provide a more meaningful and personalized learning experience.

Recommendations

1. Secondary school teachers should employ Blended Learning in the teaching of Mathematics
2. Book Authors should prepare mathematics contents based on Blended Learning teaching Strategy
3. Curriculum developers and policy makers should incorporate the use of Blended Learning in Secondary School Mathematics Curriculum

References

Adeyemi, O. O. (2024). Effects of blended learning strategy on senior secondary schools students' performance in geometry in kogi state, nigeria. *Custech international journal of education*, *1*(1), 326-344.

Boelens, R., De Wever, B., & Voet, M. (2017). Four key challenges to the design of blended learning: A systematic literature review. *Educational research review*, *22*, 1-18.

Collins, A., & Halverson, R. (2018). *Rethinking education in the age of technology: The digital revolution and schooling in America*. Teachers College Press.

Hansson, S. O. (2020). Technology and mathematics. *Philosophy & Technology*, *33*(1), 117-139.

Keykha, M., & Heidarzadegan, A. (2016). Improve academic achievement, reduce misunderstanding lasting materials and fifth grade students in science teaching approach based on the concept map. *Journal of Novel Applied Sciences*, *5*(6), 253-260.

Kumar, A., Krishnamurthi, R., Bhatia, S., Kaushik, K., Ahuja, N. J., Nayyar, A., & Masud, M. (2021). Blended learning tools and practices: A comprehensive analysis. *Ieee Access*, *9*, 85151-85197.

Luneta, K. (2022). Special challenges in mathematics education in Sub Sahara Africa. *Current Opinion in Behavioral Sciences*, *48*, 101211.

Nasamu, R. A. (2021). *Influence of teaching styles and learning styles on pupils' academic performance in numeracy in Ilorin Kwara State* (Master's thesis, Kwara State University (Nigeria)).

Ngampornchai, A., & Adams, J. (2016). Students' acceptance and readiness for E-learning in Northeastern Thailand. *International Journal of Educational Technology in Higher Education*, *13*, 1-13.

Ojala, A. (2017). Learning through producing: The pedagogical and technological redesign of a compulsory music course for Finnish general upper secondary schools.

West African Examinations Council (WAEC). (2023). Chief Examiner's Report. Lagos: WAEC.

Yusuf, M. O., & Afolabi, A. O. (2020). Effectiveness of Blended Learning Models on Students' Academic Performance in Nigeria. *International Journal of Instruction*, 13(2), 1-14.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202557

Assessment of integrating Disruptive Technology Tools on Accounting Education Curriculum among Public Universities in Northern Nigeria

ABDULLAHI, Hussaina Ahmed[1]
E-mail:abdullahihussaina058@fedpolydaura.edu.ng
Tel No: 07032392230

MARKUS, Talatu[2]
E-mail: markustalatu2@gmail.com
Tel. No: 08022375188

EMAIKWU, Godwin[3]
E-mail: godwinemaikwu025@gmail.com
Tel. No: 08027477847

LADAN, Salisu Lawal[4]
E-mail: salisladan@gmail.com
Tel. No: 07035964786

[1]Department of Office Technology and Management Federal Polytechnic Daura, Katsina State, Nigeria
[2]Department of Business Education Kaduna State College of Education Gidan-Waya, Nigeria
[3]Department of Vocational and Technical Federal Government Girls College Zaria, Kaduna State, Nigeria
[4]Department of Bursary Federal Polytechnic Daura, Katsina State, Nigeria

Abstract
The study was on Assessment of integrating Disruptive Technology tools on Accounting Education Curriculum among Public Universities in Northern Nigeria. Two (2) specific objectives, two (2) research questions and two (2) null hypotheses guided the study. The study hinged on unified Theory of Acceptance and use of Technology (UTAUT), it is a theory that explains how users adopt and use technology. It was developed by Venkatesh et al. (2003). The study employed descriptive survey research design. The population of the study was thirty (30) business education lecturers in Ahmadu Bello University, Zaria Nigeria and Abubakar Tafawa Balewa University, Bauchi. A four-rating structured questionnaire titled "Disruptive Technology in Accounting Education Curriculum Instrument (DTAECI) was the instrument used to gather data from the respondents for the study. The instrument was validated by two experts and the reliability of the instrument was determined using Cronbach Alpha method and 0.75 reliability co-efficient was obtained. The data collected from the administration of the questionnaire was coded into Statistical Package of Social Science (SPSS) version 25. The package was used to calculate mean and standard deviation to answer research questions and independent sample t-test was used to test the null hypothesis. Results from the findings among others revealed that Visual reality and augmented reality (VR/AR) simulations has not been integrated into accounting education curriculum in public universities in Northern Nigeria. It was concluded that disruptive technologies have not been integrated into accounting education curriculum among the public universities in Northern Nigeria. Based on the findings of the study, it was recommended among others that curriculum planners should regularly review and update the accounting education curriculum to integrate disruptive technologies such as AI and VR/AR into course structures, teaching and learning.

Keywords: Disruptive Technology, Accounting Education and Curriculum

Introduction
The advent of disruptive technologies has transformed the business landscape, necessitating a corresponding transformation in business education. The fourth revolution is changing the way we live, work and relate to one another. (Schwab, 2016), this revolution is characterized by the confluence of technological innovations, including artificial intelligence, block chain and cloud computing which are redefining the contours of business and commerce. According to a report by the Association to Advance Collegiate School of Business (AACSB, 2020), Business schools must be willing to innovate and experiment with new approaches to education. This includes integrating disruptive technology such as AI and block chain into the curriculum, as well as developing essential skills such as critical thinking, creativity and problem-solving.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202557

The relevance of disruptive technology on accounting education is multifaceted. It presents opportunities for innovation and growth, enabling new forms of learning and skill development. On the other hand, it poses significant challenges, including the need for continuous update of curriculum, balancing technical skills and soft skills development and addressing ethical implications. Manyika (2017) noted that the ability to learn and adapt will be increasingly important in a world where technological change is rapid and relentless. The rise of disruptive technologies has significantly reshaped various sectors, including education. Disruptive technologies as conceptualized by Christensen (2016), refers to innovations that fundamentally alter traditional systems and practices. In education, these technologies, such as artificial intelligence (AI), virtual reality (VR), augmented reality (AR), online learning platforms and gamification tools, offer new ways of delivering instruction and engaging learners. Accounting education is designed to equip students with knowledge and practical skills to pursue careers in financial reporting, auditing, taxation and advisory services. According to NPE, 2000 in Akpan, (2023), accounting education is an aspect of business education involving in addition to general education. It involves the study of acquisition of practical skills, knowledge, attitudes, understanding and competencies relating to professional occupations in some sectors of economic and social life and effectively participating in the world of work Accounting education, according to Isaac, Ibe Bassey and Evanson (2007) accounting education is a programme designed and aimed at developing skills, knowledge, and understanding that are necessary to facilitate financial information control and processing. It provides individuals opportunity for the acquisition of relevant skills, abilities and competences both mental and physical equipment for the individual to live in and contribute to the development of the nation. Accounting education incorporates a package of instructional programmes prepared to educate and enlighten "would be" accountants in the field of education, to make them versatile and adaptable to the numerous roles they may be required to play after graduation. It attempts to develop concepts, skills, rules, theories, procedures and general knowledge for solving accounting problems. It further emphasizes the ability to differentiate and integrate alternative problem-solving perspectives, the ability to identify accounting related information resources, the ability to proffer solutions to problems, develop communication skills and the ability to analyze, interpret problem situations and figure out lasting solutions (Otamiri and Ochi, 2023).

Curriculum refers to the organized set of courses and learning experiences designed to achieve specific educational goals. Accounting education curriculum serves as a framework that outlines the courses, content, materials and learning outcomes that guide students to acquire both the theoretical and practical skills required for the accounting profession. In respond to changing industry expectations, professional bodies such as Institute of Chartered Accountants of Nigeria (ICAN) and Association of Nigeria Accountant (ANAN) emphasize the need for graduates to possess advanced technology skills alongside traditional accounting competencies (Uche, 2002). In Nigeria, the incorporation of disruptive technologies offers an opportunity to bridge the gap between theoretical accounting education and practical professional skills. Technologies like online platforms enable access to learning materials beyond physical classrooms, while AI tools provide adaptive learning experiences tailored to individual student need (Anam, 2019). These shifts emphasize the need for curriculum reform to produce graduates who are well-prepare for modern accounting roles, where digital tools are critical. This study aims to explore the relevance of disruptive technologies on accounting education curriculum in universities in Nigeria

One of the aims of integrating new technologies is to improve the quality of education. The education sector is expected to be technologically driven and requires that technological resources are fully integrated. The integration of disruptive technology in education enables a transformative shift from traditional teaching methods to immersive, interactive and personalized learning experiences. Unfortunately, the accounting education curriculum in university in Nigerian are being challenged by the emergence of disruptive technologies such as artificial intelligence (AI), online learning platforms, virtual reality (VR) simulation and cloud-based tools. Traditional accounting education, which relies heavily on classroom instruction and outdated tools, struggles to remain relevant in preparing students for dynamic market demands. This misalignment between the curriculum and modern technologies threatens to reduce the effectiveness of accounting education in producing graduates equipped with skills that align with professional and industry needs. Despite the widespread adoption of technologies like online learning and AI in education globally, Nigerian universities have faced significant barriers in integrating these innovations effectively. Challenges such as limited digital infrastructure, undertrained educators and lack of curriculum reforms have hindered the full adoption of these disruptive tools in accounting programs (Anam, 2019: Uche, 2002). These gaps not only affect teaching practices but also compromise the ability of students and universities to meet international standards in accounting education. Moreover, professional bodies such as the institute of chartered accountants of Nigeria (ICAN) and the Association of National Accountants of Nigeria (ANAN) emphasize the need for accounting graduates to be proficient in the use of modern technological tools. However, the curriculum in many universities in Nigeria still lag behind

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202557

these evolving demands, which limits the opportunities for students to gain hand-on experience with technologies that are reshaping the accounting profession globally (Osuji & Nwoke, 2019). Addressing this problem requires a strategic rethinking of the accounting education curriculum to incorporate disruptive technologies that foster adaptive learning, interactive tools and cloud-based accounting systems. This study thus seeks to explore the relevance of disruptive technologies into accounting education curriculum to enhance teaching and learning outcomes. By identifying the gaps and providing recommendations, the research aims to ensure that universities in Nigeria remain competitive and relevant in the global educational and professional landscape.

Research Objectives

The general objective of the study was to examine the relevance of disruptive technology on accounting education curriculum in universities in Nigerian. The specific objectives were to:

1. Evaluate the relevance of artificial intelligence (AI) adaptive learning systems on accounting education curriculum among public universities in Northern Nigeria.
2. Assess the relevance of visual reality and augmented reality (VR/AR) simulations on accounting education curriculum among public universities in Northern Nigeria.

Research Questions

1. What is the relevance of artificial intelligence (AI) adaptive learning systems on accounting education curriculum among public universities in Northern Nigeria.?
2. What is the relevance of visual reality and augmented reality (VR/AR) simulations in accounting education curriculum among public universities in Northern Nigeria.?

Research Hypotheses

1. Artificial intelligence (AI) adaptive learning systems has no relevance on accounting education curriculum among public universities in Northern Nigeria.
2. Visual reality and augmented reality (VR/AR) simulations has no relevance on accounting education curriculum among public universities in Northern Nigeria.

Theoretical Framework

The study is based on unified Theory of Acceptance and use of Technology (UTAUT), it is a theory that explains how users adopt and use technology. It was developed by Venkatesh et al. (2003). The theory posits that four key constructs influence an individual's intention to use technology:

1. Performance Expectancy: the degree to which an individual believes that using the technology will help them attain gains in job performance
2. Effort Expectancy: the degree to which an individual believes that using the technology will be effortless.
3. Social Influence: the degree to which an individual perceives that others believe they should use the technology.
4. Facilitating Conditions: the degree to which an individual believes that they have the resources and support needed to use the technology.

This theory provides a comprehensive framework for understanding the complex factors that influence technology adoption and use in educational setting. The implication of the theory on the study is that, it investigates how these factors influence educators' adoption and use of technology-enhanced learning tools in accounting education, and how they impact student learning outcomes.

Disruptive Technology (DT)

Disruptive technology is a technology that disrupts the way businesses, consumers, and industry's function. Often times these technologies are created in order to improve upon preexisting products and procedures. However, the objective of these innovations is now expanding past the mere improvement of existing items. Previously, disruption had been a secondary result of innovation. Currently, in today's dynamic technological landscape, the concept of disruption has become the primary goal of innovation, rather than a byproduct. This shift in thinking has led to new markets, new demands, and new problems that consumers and producers had previously been unaware of. Bunney (2018) defined disruptive technology as a technology that alters how markets, customers, and entire industries in a system operate. These technologies are frequently developed to enhance already-existing goods and practices but the overall goal of these breakthroughs goes beyond merely enhancing what already exists. The development of telecommunications, transportation, and internet infrastructure has led to an increase in the exchange of ideas, goods, services and other activities which is known as globalization. Deloitte (2017) defined disruptive technology as those innovations that help develop new markets to disrupt or damage current markets and eventually replaces the prior technology. Presently, there is a revolution in technology because it is changing how people

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202557

communicate, live, and work together in a place when pre IT era and post IT era are considered (Rukmini, 2018). Disruptive technologies in education defined by Weise (2022), as the innovative use of digital tools, platforms and resource that fundamentally transform the way students learn, teachers teach and educational institution operate often by increasing accessibility, affordability and effectiveness.

Disruptive Technology in Education

Online learning: also known as e-learning, digital learning, or online education, refers to the process of acquiring knowledge, skills and information through electronic technologies such as internet, computers and mobile devices. According to Simonson et al (2015) online learning is an educational approach that utilizes electronic technologies to deliver instructional content, facilitate communication and interaction and support learning outcomes, often through online platforms courses or degree programs.

Chat-Based Collaboration: Chat-based Collaboration Platforms is another important disruptive technology in education. It involves web-based video chatting apps allow demonstrating presentations in real-time mode to audiences, which helps to make the learning process easier and more social. According to Kim et al (2020) chat-based learning refers to an educational approach that utilizes conversational interfaces, such as messaging platforms, chat bots and voice assistants to facilitate learning interactions, provide personalizes support and enhance students' engagement.

AI-guided learning: Artificial Intelligence is a field of computer science that focuses on creating intelligent machines capable of performing tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making and language translation (Dongre, Pandey, & Gupta, 2020). In the same light, Ezeribe, (2019) viewed Artificial Intelligence as a method of making a computer, a computer-controlled robot, or software think intelligently like the human mind. Artificial intelligence works by interpreting enormous amounts of data. The data is then analyzed and verified for accuracy. Once this data is analyzed, the software begins to learn how to handle different assigned tasks. These tasks then begin to be carried out automatically by the software. The software then continues to self-learn and engages in constant improvement to better its ability and efficiency in analyzing the data and completing its assigned tasks. AI- Power adaptive learning systems personalize learning experiences by tailoring content based on the pace and needs of students. In accounting education, this allows learners to gain a deeper understanding of core concepts at their own speed, ensuring better engagement with topics like financial reporting and auditing

Virtual Reality (VR) and Augmented Reality (AR): is a type of disruptive technology that is refers to the simulation of human-like intelligence in virtual environments, enabling machines to interact, learn and adapt in complex dynamic situations. VR/AR is a technology that overlays digital information, images or objects onto the real world using a device camera, display and sensors. VR/AR technologies simulate real-world accounting environments, giving students hand-on experience without the risks associated with real financial transaction. It can be used to create virtual auditing scenarios or simulated accounting processes improving students, practical skills.

Methodology

The study adopted a descriptive survey research design. The rationale behind this choice was that it explains how the disruptive technology is relevant to accounting education curriculum. The population of this study was thirty (30) business education lecturers in Ahmadu Bello University, Zaria Nigeria and Abubakar Tafawa Balewa University, Bauchi, and due to the small number of the respondents, the whole population was used meaning that purposive sampling techniques was adopted. A self-structured instrument tagged: "Disruptive Technology on Accounting Education Curriculum Instrument (DTAECI)" validated through face and content validity by three experts in the field of Business Education was used for the study. The instrument was designed on 4-point scale of Strongly Agree (SA) 4, Agree (A) 3, Disagree (D) 2 and Strongly Disagree (SD) 1. Cronbach Alpha reliability coefficient was used to determine the reliability index and the instrument yielded a reliability coefficient of 0.84 which was high enough for the instrument to be considered reliable. Mean and standard deviation was used to answer the research questions. Any item equal or above 2.50 was considered strongly agreed and agreed while any item below 2.50 was considered strongly disagreed and disagreed. Independent sample t-test analysis was used to test the null hypothesis at a significant level of 0.05.

Presentation of Results

Research Question 1: What is the relevance of artificial intelligence (AI) adaptive learning systems on accounting education curriculum among public universities in Northern Nigeria.?

Table 1: Mean and Standard Deviation on the relevance of AI Adaptive learning systems on accounting education curriculum among public university in Northern Nigeria

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202557

S/N	ITEMS	MEAN	STANDARD DEVIATION	DECISION
1.	AI powered system provide relevant and up-to-date resources such as quizzes, videos, case studies for accounting education curriculum	2.12	0.81	D
2.	Personalized learning paths are provided based on individual learner data within the accounting education curriculum	2.12	0.81	D
3.	Students frequently interact with virtual tutors or Chabot's to solve accounting related queries	2.32	0.79	D
4.	The learning analytics dashboard provides useful insights into students' progress in accounting education curriculum	2.40	0.90	D
5.	The accounting curriculum incorporates feedback from AI adaptive learning to improve course content	2.41	0.91	D
6.	The AI adaptive learning system allows students to progress at their own pace through the accounting education curriculum.	2.33	0.78	D
7.	Lecturers find the AI adapting learning system easy to navigate and manage	2.40	0.90	D
	Weighted mean	2.31	0.84	D

Source: Research work, 2024

Result in table 1 showed the weighted mean score of 2.31 and standard deviation of 0.84 which is below the benchmark of 2.5, the result indicates a general disagreement regarding the relevance of AI adaptive learning systems on the accounting curriculum in universities in Nigeria. This implies that AI adaptive learning system is not relevant in accounting education curriculum in universities in Nigeria.

Research Question 2: What is the relevance of visual reality and augmented reality (VR/AR) simulations in accounting education curriculum among public universities in Northern Nigeria?

Table 2: Mean and Standard Deviation on the relevance of VR/AR simulations on accounting education curriculum among public university in Northern Nigeria

S/N	ITEMS	MEAN	STANDARD DEVIATION	DECISION
1.	VR/AR simulation hardware (e.g headsets or controllers) are incorporated into the accounting education curriculum	2.48	0.76	D
2	The software platform provides a user-friendly interface for accessing VR/AR accounting modules.	2.12	0.81	D
3	VR/AR simulation offers realistic scenarios relevant to real-world accounting tasks such as financial reporting, auditing.	2.40	0.73	D
4.	The VR/AR interface is intuitive and easy to navigate for both students and lecturers	2.21	0.81	D
5.	The integration of VR/AR simulations supports experiential learning within the accounting curriculum	2.39	0.73	D
6.	The VR/AR platform allows students to interact and collaborate within shared virtual spaces	2.12	0.81	D
7.	Students receive real-time feedback on their performance during VR/AR accounting simulation	2.40	0.73	D
	Weighted mean	2.30	0.77	D

Source: Research work, 2024.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202557

Result in table 2 showed a weighted mean score of 2.30 and standard deviation of 0.77, which is below the benchmark of 2.5, the result indicates a disagreement on the relevance of VR/AR simulations in accounting education. This implies that VR/AR simulations are not relevance in accounting education curriculum in university in Nigeria.

Test of Null Hypotheses

The results of the four null hypotheses which were tested as 0.05 level of significant are presented in table 3 and 4.

Null Hypothesis 1: Artificial intelligence (AI) adaptive learning systems has no relevance on accounting education curriculum among public universities in Northern Nigeria.

Table 3: independent sample t-test on relevance of AI Adaptive learning systems on accounting education curriculum among public university in Northern Nigeria

Variable	Mean	SD	Test value	t-test	P.value	Decision
AI adaptive learning system	2.31	0.84	2.5	-1.99	0.052	Retained

The result obtained in table 3 shows the mean score of 2.31, the t-test of -1.99 which is less than the test value of 2.5, with a p-value of 0.052 which is greater than 0.05 level of significant, the result is not statistically significant, the null hypothesis is therefore retained, which implies that Artificial intelligence (AI) adaptive learning systems has no relevance in accounting education curriculum among public universities in Northern Nigeria.

Null Hypothesis 2: Visual reality and augmented reality (VR/AR) simulations has no relevance on accounting education curriculum among public universities in Northern Nigeria.

Table 4: independent sample t-test on relevance of VR/AR simulations on accounting education curriculum among public university in Northern Nigeria

Variable	Mean	SD	Test value	t-test	P-value	Decision
VR/AR Simulation	2.30	0.77	2.5	-0.46	0.648	Retained

The test of hypothesis in table 4 shows the mean score of 2.30, the t-test of -0.46 which is less than the test value of 2.5, with a p-value of 0.648 which is greater than 0.05 level of significant, the result is not statistically significant, the null hypothesis is therefore retained, which implies that Visual reality and augmented reality (VR/AR) simulations has no relevance on accounting education curriculum among public universities in Northern Nigeria.

Discussion of Findings

The test of null hypothesis one as shown in table 3, revealed that Artificial intelligence (AI) adaptive learning systems has no relevance on accounting education curriculum in universities in Nigeria. The result agreed with that of Osuala and Ezenwafor (2012) who observed that most of the new technologies were not available in teaching and learning business education.

The test of null hypothesis two as shown in table 4, revealed that Visual reality and augmented reality (VR/AR) simulations has no relevance on accounting education curriculum in universities in Nigeria. The result agreed with that of Islam and Selim (2006) in their study in Bangladesh who concluded that e-learning has gained wide popularity in institutions in developed countries but unfortunately in developing countries, it was still a dream due to very high cost of ICT infrastructure and many other socio-economic factors.

Conclusion

Based on the findings of the study, it was concluded that disruptive technologies has not been integrated in accounting education curriculum among public universities in Northern Nigeria. However integration of disruption technologies into the accounting education curriculum in universities in Nigeria is critical for producing competent and industry-ready graduates. These technologies enhance the curriculum by promoting practical, flexible and engaging learning experiences.

Recommendations

1. Curriculum planners should regularly review and update the accounting education curriculum to integrate disruptive technologies such as AI and VR/AR into course structures, teaching and learning.
2. The government, university management and private organizations should invest in reliable internet access, uninterrupted power supply and digital infrastructure to facilitate the use of AI adaptive learning systems and VR/AR technologies.
3. University management should provide Training program for lectures to improve their skills in using the disruptive technologies.

References

AACSB (2020). Business Education in a Disruptive Age. Tampa, FL: Association to Advance Collegiate Schools of Business.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202557

Akenbor, C.O. (2020). Business Education in Nigeria: Challenges and way forward. Journal of Education and Practice, 11(14), 1-8.

Akpan, O. N (2023). The relevance of Accounting Education: A Panacea to Skills Acquisition for Self Employment and Sustainable Development International Journal of Research Education and Management Science, Vol 4(2), New York 35.

Anam, B. (20 19). Technological Innovation and Higher Education in Nigeria.

Andrews, K.G., Demps, E. L. (2003). Distance education in the U.S. and Canadian undergraduate dental curriculum. Journal of Education 67(4), 427-38. Atah, C. A. & Ukah, T. A. (2019). Issues and prospects in business education curriculum in the 21st Century. Association of vocational & technical educators of Nigeria (AVTEN), 24 (2) 83-94

Bates, A.W., Sangra, A., & Glanfield, K. (2018). Personalized learning and the ultra-connection: A roadmap for Canadian education. Candian Journal of learning and Technology, 44(1), 1-24.

Bonnafous-Boucher,M. & Pesqueux, Y (2019). The impact of digitalization on management education. Journal of Management Education, 43(1), 7-25.

Bunney, J. (2018, September 4). *Accountants expect technology transformation by 2028.* Retrieved from https://www.accountancydaily.co/accountants-expect-technology- transformation-2028.

Christensen,C.M.(2016). The Innovator's Dilemma: When New Technologies Cause Great Firms to fail. Harvard Business Review Press.

Gartner (2020). 2020 CEO Survey: The tear of the Customer. Stamford, CT: Gartner.

Ile C.M., Udegbunam E.O., Odimmega C.G. Challenges of Integrating New Technologies For Teaching and Learning in the Business Education Programme of Colleges of Education in South-East Nigeria. Education Journal. Special Issue: New Dimensions in Vocational Business Education Teaching and Learning. Vol.4, No.6-1, 2015, pp9-14.

Imoekparia,P.O & Ediagbonya, K (2012). Employability of business education graduates Educational Research 3(8), 20-34.

Kim, J., Lee, Y., and Kim, B. (2018). Effects of Chatbot Based Learning on Students' Engagement. Journal of Educational Computing Research.

Kirkwood, A., and Price, L (2014). Technology-enhanced learning and teaching in higher education. Learning, Media and Technology, 39(1), 6-36.

Manyika, J., Chui, M., Bisson, P., Bughin, J., Woetzel, J., & Stolyar, K. (2017). A Future that works: Automation, Employment and Productivity. McKinsey Global Institute.

Ogunsola, L.A. (2011). The Impact of technology on business education in Nigeria. Journal of Business and Management, 16(1), 1-10.

Osuala, E.C. (2009) Business and Computer Education. Enugu: Cheston Agency Limited.

Otamiri, S. and Ochi, J. E. (2023). Accounting Education in Nigeria Universities and Youth Empowerment in Edo State. International Journal of Education and Sustainable Development, 10, (2); 81-82.

Schwab, K. (2016). The Fourth Industrial Revolution. World Economic Forum.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202558

Qualitative Study on Integration of Artificial Intelligence for Self-Regulated Learning among Higher Institutions of Learning in Nigeria: Rethinking Learner Autonomy

OMOYAJOWO, Bamidele Stephen[1]
Omoyajowo.bamidele@lcu.edu.ng
https://orcid.org/0009-0009-7824-2580;
Phone: 09039287758, 07034563375

BAMBI, Babatunde Ishola[2]
OrcidID: https://orcid.org/0009-0009-2236-8715
E-mail: bambi.babatunde@westmidlands.university
Phone: +2348063462190

[1]Department of Science Education, Faculty of Education, Lead City University
[2]Department of Educational Management, West Midlands Open University, Lagos State, Nigeria

Abstract
The integration of Artificial Intelligence (AI) in education is transforming global teaching and learning practices; however, its application in enhancing self-regulated learning (SRL) and learner autonomy within Nigerian higher education remains under-theorized. This study adopts a theoretical approach to examine how AI technologies, such as intelligent tutors, Chatbots, and learning analytics dashboards can support the core dimensions of SRL: planning, monitoring, and reflection. Drawing on Zimmerman's Self-Regulated Learning Theory and Bandura's Social Cognitive Theory, the paper explores how AI tools promote metacognitive awareness, goal setting, and feedback-driven reflection, thus enabling learners to become more autonomous and strategic in managing their learning. The study also critically examines the contextual challenges hindering effective AI adoption, including infrastructural deficits, limited educator readiness, and ethical concerns around transparency and data privacy. A conceptual framework is proposed to illustrate the pathways through which AI tools can enhance learner agency, moderated by socio-technical and institutional factors. The paper concludes with recommendations for curriculum innovation, policy reform, and professional development to support ethical, inclusive, and learner-centred AI integration in Nigerian higher education.

Keyword: Learner autonomy, Artificial Intelligence, Self-regulated learning, Higher education, Nigeria

Introduction
Global education is rapidly evolving, and new technology and student autonomy are becoming increasingly significant. AI is one of the most potent forces in this evolving society. It changes how knowledge is shared, accessed, and personalised. Intelligent tutoring systems, learning analytics, generative AI models (such as ChatGPT), and adaptive learning platforms are changing the teacher-centred paradigm to be more learner-centred. AI offers a powerful opportunity to rethink educational practices, particularly in the cultivation of learner autonomy, in Nigerian higher education, where overcrowded classrooms, inadequate instructional materials, and limited access to personalised support persist. An emerging field, artificial intelligence in education (AIED) affects curriculum design, evaluation, and learner assistance (Chiu et al., 2021). AI's ability to handle vast amounts of data, detect learner behaviour patterns, and deliver fast feedback makes it a tempting tool for educational fairness and personalisation. Hwang et al. (2020) state that AI's educational functions include intelligent content development, adaptive instruction, automated assessment, and dynamic learner modelling. Recently, apps like ChatGPT have showed promise as learning companions, explaining, summarising, and encouraging deeper thought (Sullivan et al., 2023). AI has great promise, but it must be implemented carefully, especially in locations with different infrastructure and pedagogical preparedness.

Educational research has also focused on self-regulated learning (SRL) as a key capacity for academic performance and lifetime learning. SRL requires learners to plan, monitor, and evaluate their learning (Lee et al., 2018). Setting objectives, managing time, using tactics, requesting support, and reflecting on results are examples. When knowledge is abundant and instructors are shifting from information providers to facilitators, learners must be able to govern their own learning. Self-regulation abilities are crucial to academic success and retention in higher education, especially online and hybrid learning (Zhang et al., 2022; Karlen, 2023). Fostering SRL is difficult, especially in schools with rote learning, teacher-dependence, and inadequate metacognitive instruction. Higher education in Nigeria is no exception. Traditional lectures impede student freedom,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202558

metacognition, and strategic learning. Given these limits, AI can improve SRL by providing timely feedback, fostering reflective thinking, scaffolding goal-setting, and replicating tutor-learner interaction (Chiu, 2023). AI tools may assess students' study patterns and recommend personalised improvement techniques, helping them manage their academic development. According to Gui (2021), 5G and AI can digitise and democratise education, empowering students from all socioeconomic levels. AI can help students in Nigeria access personalised learning resources regardless of location or institution, reducing digital inequalities. Despite its promise, AI in education raises ethical, data privacy, algorithmic bias, and academic integrity concerns (Sullivan et al., 2023). Higher education relies on authentic learning and assessment for academic legitimacy, making these concerns crucial. Thus, stakeholders must balance AI's capabilities with education's essential principles.

This study investigates how AI can increase learner agency and autonomy in a situation with potential and challenges. The paper examines how AI apps are being used (or could be used) to facilitate SRL among Nigerian university students, identifies enablers and hurdles, and provides evidence-based suggestions for educators and institutions. This study adds to the growing body of research on the pedagogical, technological, and environmental factors that affect AI use in education. The findings should inform worldwide movements towards digital and learner-centred education policy and instruction. The project also aims to help Nigerian higher education improve academic performance and prepare students for the knowledge economy, which requires self-directed, digitally literate graduates. Furthermore, this study comes at a crucial time in global and local education systems. It recognises that while AI has great potential to improve education, its greatest influence may come from empowering learners to take ownership of their learning journeys. This study examines AI and self-regulated learning in Nigerian higher education to assist students become more independent, engaged, and successful in the digital age.

Literature Review

The concepts of learner autonomy and self-regulated learning (SRL) have become increasingly central to contemporary educational discourse, especially in light of recent technological advances and the shift toward more learner-centred pedagogies. These constructs, while related, emphasize distinct but complementary facets of the learning process. Learner autonomy emphasizes the learner's capacity to take control of their learning, while SRL focuses on the strategies and cognitive processes learners use to manage, monitor, and reflect on their learning. Together, they offer a powerful framework for fostering lifelong learning, academic success, and adaptability in diverse educational contexts.

Learner Autonomy: Conceptual Foundations

Learner autonomy is the skill and willingness to take charge of learning. It requires independence from direct instructor control and educated choices about learning goals, resources, tactics, and assessments. Loeng (2020) states that adult education and lifelong learning allow learners to diagnose their learning requirements, set goals, find resources, and evaluate outcomes. Adult learners need self-direction, and younger generations in complex, information-rich situations need it more. With Generation Z at the forefront of education, autonomy is both a pedagogical ideal and a practical requirement. Chardonnens (2025) notes that Generation Z learners want personalised, interactive, and tech-mediated learning. They thrive in autonomous contexts with structured metacognitive growth and technology scaffolding. This makes learner autonomy a dynamic interaction between freedom and guided help, especially as education moves towards hybrid and digital models.

Self-Regulated Learning (SRL): Strategies and Significance

Self-regulated learning refers to the degree to which learners are actively involved in their own learning process through goal setting, strategy selection, self-monitoring, and reflection. SRL is a cyclical process that encompasses cognitive, metacognitive, motivational, and behavioural components. Teich et al. (2024) further demonstrate the importance of adaptive support mechanisms in promoting SRL strategies, particularly in continuing education and online courses. Their findings reveal that learners often require explicit prompts and personalized feedback to effectively regulate their learning, even when they have access to quality digital content. Chardonnens (2025) also emphasizes the integration of metacognitive strategies into technology-enhanced learning environments. He posits that AI-powered tools can facilitate SRL by offering real-time feedback, suggesting learning strategies, and helping students visualize their learning progress. For example, intelligent tutoring systems can prompt students to reflect on their understanding or adjust their approach to a problem. Such tools act as "scaffolds" that gradually build learners' capacity for autonomous learning.

Applications of Artificial Intelligence in Education

AI is being used in education to improve teaching, streamline administration, and personalise learning. AI offers revolutionary prospects across multiple academic levels as educational institutions worldwide aim to increase efficiency and learner outcomes. Ge and Hu (2020) note that AI has revolutionised higher education management with intelligent scheduling, automated evaluation, and predictive analytics. These apps optimize resource allocation, decrease administrative burdens, and

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202558

enable data-driven decision-making. AI has helped administrative management organisations estimate enrolment trends, identify at-risk students, and automate repetitive jobs, increasing responsiveness and planning. AI-powered learning tools enable personalised and adaptable instruction. Intelligent teaching systems, speech recognition tools, and automated essay scoring engines are listed by Xu et al. (2021). The tools adjust content to individual learners, track learning behaviours in real time, and provide quick feedback, improving student engagement and learning efficiency. In Nigeria, Ezekiel and Akinyemi (2022) study University of Ibadan teachers' views on AI in education. Their findings show that AI's potential to improve assessment accuracy and student tracking is becoming more widely known. The study also raises technical infrastructure, training, and ethical issues like data privacy and academic integrity. These studies demonstrate AI's many educational uses. From administration to personalised learning, AI could transform institutions and education. However, careful investment in infrastructure, capacity building, and ethical frameworks is necessary to fully realise these benefits, especially in developing countries like Nigeria.

Theoretical Framework

Zimmerman's Self-Regulated Learning Theory

Zimmerman's Self-Regulated Learning (SRL) Theory, proposed by Barry J. Zimmerman in the 1980s, is a comprehensive framework that explains how learners take control of their own learning processes through a cycle of planning, performance, and self-reflection. According to Zimmerman (1986), self-regulated learners are those who actively set goals, select appropriate strategies, monitor their progress, and reflect on the outcomes of their learning. The theory emphasizes that effective learning is not just about acquiring knowledge but also about developing the ability to manage one's cognitive, motivational, and behavioural processes in pursuit of academic success. This theory is highly relevant to the present study, as it provides a foundation for understanding how students in Nigerian higher education can become autonomous learners. In particular, it supports the notion that self-regulated learning is not innate but can be developed and enhanced through targeted interventions. Artificial Intelligence (AI) tools, such as intelligent tutoring systems and learning analytics platforms, can play a crucial role in facilitating the SRL cycle by prompting learners to set goals, track their progress, and receive personalized feedback. As such, Zimmerman's theory serves as a conceptual lens for exploring how AI can enhance learner autonomy and improve educational outcomes in Nigerian universities.

Bandura's Social Cognitive Theory

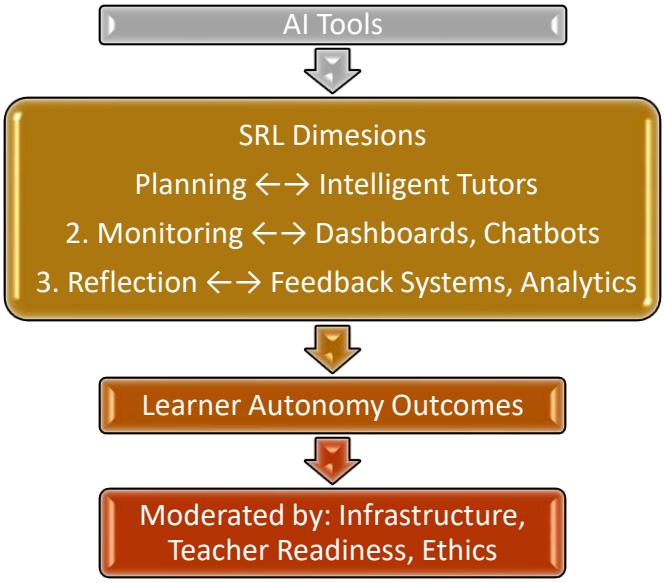
Albert Bandura's Social Cognitive Theory, originally developed in 1986, is a psychological framework that emphasizes the role of observational learning, social interaction, and self-efficacy in human behaviour. Central to the theory is the concept of reciprocal determinism, which suggests that personal factors (like beliefs and attitudes), behavioural patterns, and environmental influences interact to shape individual learning and development. Bandura (1986) argued that individuals learn not only through direct experience but also by observing others and modelling their behaviours. In the context of this study, Bandura's theory provides a social and cognitive foundation for understanding how learners develop the confidence and skills needed to regulate their own learning. AI tools, when designed effectively, can simulate social interactions (e.g., via chatbots or adaptive feedback systems) that reinforce learning through modelling and encouragement. For example, AI-powered virtual tutors can demonstrate problem-solving strategies, provide motivational scaffolding, and adapt content delivery based on learner behaviour, all of which align with Bandura's emphasis on observational learning and environmental support. Moreover, by enhancing students' self-efficacy through timely feedback and personalized learning paths, AI can strengthen their willingness to engage in autonomous and self-regulated learning, especially in resource-constrained environments like Nigerian higher education.

Conceptual Framework

The conceptual framework for this study is designed to illustrate the interplay between Artificial Intelligence (AI) tools and the core dimensions of Self-Regulated Learning (SRL), such as planning, monitoring, and reflection, within the context of Nigerian higher education. Grounded in Zimmerman's Self-Regulated Learning Theory and Bandura's Social Cognitive Theory, this framework explores how specific AI applications (such as intelligent tutors, learning analytics dashboards, and chatbots) can facilitate the development of autonomous learning behaviours by supporting students' metacognitive and motivational processes. In the Nigerian educational context, where challenges such as limited teacher-student interaction, infrastructural gaps, and uneven access to digital resources persist (Petrie et al., 2020; Nkwenti et al., 2023). AI tools offer a transformative means of enabling students to independently manage their learning. However, the use of AI must be guided by ethical standards (Nguyen et al., 2022; AI Ethics and Higher Education, 2022) and pedagogical purpose (Jin et al., 2023; Hooda et al., 2022). The framework is shown in figure 1 below:

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202558

Figure 1: AI-SRL-LR Model



Source: Authors (2025)

Constructs and Relationships in the AI-SRL-LR Model

The conceptual framework is organized around two major constructs:

AI Tools in Education: AI applications provide intelligent and adaptive support to learners through:

a) **Intelligent Tutoring Systems (ITS):** Deliver personalized instruction and instant feedback (Hooda et al., 2022).
b) **Chatbots and Virtual Assistants:** Offer 24/7 learning support, answer queries, and provide reminders.
c) **Learning Analytics Dashboards:** Help learners track their progress, time management, and resource use (Jin et al., 2023).

SRL Dimensions: Self-regulated learning consists of three cyclical and interdependent phases:

a) **Planning:** Setting learning goals, selecting strategies, and allocating resources.
b) **Monitoring:** Tracking progress, assessing performance, and adjusting strategies.
c) **Reflection:** Evaluating learning outcomes, identifying mistakes, and planning for improvement.

The model proposes that Artificial Intelligence (AI) tools act as external mediators that scaffold learners' self-regulated learning (SRL) processes by supporting them through each phase of the SRL cycle: planning, monitoring, and reflection. These tools are not merely technological add-ons but serve as active facilitators of cognitive and metacognitive development. During the planning phase, intelligent tutoring systems guide students in setting realistic academic goals, identifying learning objectives, and selecting appropriate strategies. By offering personalized recommendations based on learners' performance history and cognitive profiles, these AI tools empower students to initiate learning with clarity and intention.

In the monitoring phase, tools such as chatbots and learning analytics dashboards provide real-time feedback on learners' activities, track progress toward goals, and highlight areas of difficulty or improvement. This immediate, data-driven insight encourages students to evaluate their ongoing performance and make strategic adjustments where necessary. During the reflection phase, AI technologies support post-task evaluation through automated feedback, personalized performance summaries, and visual representations of learning trends. These reflective prompts and analytics encourage deeper metacognitive processing, enabling students to assess the effectiveness of their learning strategies and make informed changes for future tasks. Importantly, social and environmental factors, as emphasized in Bandura's Social Cognitive Theory, moderate the relationship between AI tools and SRL outcomes. The success of AI-enhanced learning depends significantly on the availability of enabling infrastructure such as internet connectivity and digital devices, as well as educator readiness and institutional support systems (Ayanwale et al., 2022; Oyetola et al., 2024). Without these conditions, the potential of AI tools to facilitate autonomy and SRL remains limited. Finally, ethical considerations are foundational to ensuring that AI promotes

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202558

learner agency rather than dependency or manipulation. As highlighted by Nguyen et al. (2022) and Onyejegbu (2023), transparency in AI decision-making, data privacy protections, and fairness in algorithmic outputs are essential for building trust and encouraging meaningful engagement. Responsible AI use in education must therefore align with principles that uphold learner dignity, equity, and empowerment.

Methodology

This study adopted a theoretical research approach to critically explore the intersection between learner autonomy, self-regulated learning (SRL), and the role of Artificial Intelligence (AI) in Nigerian higher education. Unlike empirical research that relies on primary data collection, theoretical research focuses on synthesizing existing knowledge, frameworks, and conceptual models to generate new insights or reinterpret existing phenomena (Anfara & Mertz, 2014). In this context, the study aimed to conceptualize how AI technologies can be harnessed to promote SRL and learner autonomy within the unique social, cultural, and infrastructural realities of Nigeria's tertiary education system. The research employed a descriptive theoretical design, which is appropriate for articulating and analysing the components of complex educational issues without direct fieldwork or experimentation (Miksza & Elpus, 2018). Descriptive theoretical designs are commonly used in education and social sciences to analyse relationships among theoretical constructs, clarify definitions, and propose explanatory models. Through this design, the study systematically reviewed relevant literature, examined existing theories, and applied them to the Nigerian higher education context. The study relied primarily on secondary data, drawn from a range of peer-reviewed journal articles, policy documents, theoretical books, and empirical reports. The selected literature included foundational works on self-regulated learning and learner autonomy, as well as contemporary studies on AI integration in education. The research also incorporated policy documents and theoretical texts that addressed educational challenges in Nigeria, particularly those related to digital transformation, pedagogy, and access to learning technologies. A conceptual analysis method was employed to organize and interpret the selected literature. This involved identifying key concepts such as "learner autonomy," "metacognition," "AI-enhanced learning," and "self-regulation," and examining their interrelationships through theoretical mapping. Drawing on the works of Welch and Patton (1992), this analytical process was iterative, allowing for both deductive engagement with existing theoretical constructs and inductive interpretation of their relevance to the Nigerian higher education context.

Discussion of Findings

AI and the Promotion of Metacognition

Learners can monitor, assess, and alter their learning techniques through metacognition. Students rarely obtain metacognitive help in typical Nigerian classrooms, which are lecture-based and provide little formative feedback. However, AI provides revolutionary tools that help this learning element. According to Jin et al. (2023), AI applications like learning analytics dashboards, intelligent tutoring systems, and virtual learning companions are helping students understand their cognitive processes. These technologies show learning progress in real time, suggest strategic changes, and stimulate reflection. AI-powered systems can help Nigerians overcome overworked professors and limited resources by providing continual, individualised feedback that helps students assess their learning. AI can identify trends in student blunders and promote metacognition like "Do you need to revisit this concept?" or "What strategy worked best for you in solving this type of problem?" (2022, Hooda et al.) These reflecting cues let students take ownership of their learning, a prerequisite for educational autonomy. AI also promotes metacognition by making learning apparent. AI design should be transparent, according to Nguyen et al. (2022), so learners may understand how their data is used and how recommendations are made. Transparency promotes trust and improves metacognitive awareness by helping students interpret feedback and adjust their strategies. AI-driven learning platforms can help passive Nigerian university students become active and self-reflective learners.

AI and Goal Setting

SRL also requires setting SMART goals to guide learning. AI provides structured help through personalised goal recommendations, progress tracking, and adaptive feedback loops. AI systems can help students define feasible academic goals based on their learning history and recommend step-by-step methods to achieve them, according to Jin et al. (2023). This scaffolding is especially useful for Nigerian higher education students who lack academic planning and strategic learning expertise. AI links goal achievement with real-time feedback and progress visualisations, motivating users. Hooda et al. (2022) discovered that students are more inclined to persevere and adapt their techniques when they can observe their progress towards specified goals, such as understanding a concept or improving evaluation scores. Due to overcrowded classrooms, inadequate instructor attention, and unclear academic objectives, Nigerian students typically lack motivation. Such systems can be very effective. AI systems' goal-setting functionality lets students define their own learning goals and receive AI-generated suggestions based on their performance and preferences. This balance between autonomy and supervision follows Nguyen et

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202558

al. (2022)'s ethical AI implementation principles of learner empowerment, agency, and fairness. AI systems that enable individualised goal setting can democratise excellent learning in Nigeria, a country with educational disparity and uneven academic support.

Limitations of Rethinking Learner Autonomy in Nigeria through Artificial Intelligence

The infrastructural and digital divide in many Nigerian institutions makes using AI to promote learner autonomy difficult. AI's promise is recognised, yet many Nigerian universities struggle with internet connectivity, digital device access, power supply, and learning management systems (Petrie et al., 2020). Due to institutional issues, AI-enhanced platforms are not widely available to students, especially those in rural or impoverished universities. The preparedness and capacity of educators to meaningfully interact with AI technologies is another issue. According to Ayanwale et al. (2022), some Nigerian educators want to teach or utilise AI in classrooms, but many lack the skills, confidence, and pedagogical understanding to do so. Without well-prepared educators, AI-enhanced learner autonomy may be shallow or inconsistent, expanding the theory-practice divide. Ethics are another important obstacle. Onyejegbu (2023) warns that West African university curricula, notably Nigeria, lack consistent AI ethical integration, raising data privacy, algorithmic bias, transparency, and digital surveillance concerns. If students think AI technologies are obtrusive or untrustworthy, they may stop using them for self-directed learning. In weak or non-existent regulatory environments, ethical breaches could damage AI-driven education systems' credibility. The transition to autonomous, AI-enhanced learning is complicated by teacher-centred culture and pedagogy. In their study on library and information science educators, Oyetola et al. (2024) showed that many faculty are still adjusting to student autonomy and struggle to give up control. Innovative AI technologies for learner-driven education are delayed by institutional inertia and opposition to change.

Possibilities of Rethinking Learner Autonomy in Nigeria through AI

Though limited, AI's potential to reimagine learner autonomy in Nigerian higher education is enticing. AI can personalise learning at scale, adapt to learning styles, provide real-time feedback, and assist differentiated training. Bali et al. (2024) note that Nigerian institutions are testing AI trends like adaptive learning systems, intelligent tutors, and natural language processing applications, which could improve learner engagement and outcomes. AI can also fill gaps in learner assistance, especially in large, underfunded classrooms where kids get little attention. AI-driven analytics and automated tests give students rapid feedback and customised learning pathways, encouraging ownership. Nkwenti et al. (2023) support Africa's push towards open, flexible, and inclusive education by advocating for the strategic use of digital technologies to increase learner access and autonomy across varied contexts. When done publicly and with learner initiative, ethical AI development and deployment may build trust and engagement. AI Ethics and Higher Education (2022) recommends fairness, inclusion, and informed consent in AI application. If Nigerian schools include these concepts into their AI policies and practices, students may see AI as a tool that empowers rather than regulates their learning. Building local AI capacity is another option. Nigerian institutions can invest in AI technologies suited to local languages, curriculum, and pedagogy due to the present AI trend. Localised innovation boosts relevance, sustainability, and educational transformation ownership.

Conclusion

This study has illuminated the transformative potential of AI technologies in fostering learner autonomy through enhanced metacognition, goal setting, and self-regulated learning (SRL). Grounded in Zimmerman's Self-Regulated Learning Theory and Bandura's Social Cognitive Theory, the study has shown that AI can act as a personalized tutor, reflective partner, and motivational guide especially in educational contexts where traditional instruction fails to promote independent learning. However, the study also recognizes structural, pedagogical, and ethical limitations that must be addressed to fully harness the benefits of AI for Nigerian students. Despite infrastructural constraints, low digital literacy among educators, and ethical concerns around data privacy and equity, the findings indicate a significant opportunity to integrate AI tools to bridge learning gaps, increase learner agency, and modernize teaching and learning practices. If well implemented, AI can empower students to become autonomous, reflective, and goal-oriented learners, thus positioning Nigeria's higher education sector for global competitiveness.

Recommendations

Based on the findings and discussions, the following recommendations are offered:

1. Government and institutional stakeholders should prioritize investments in reliable internet access, modern computing facilities, and power supply to ensure that AI technologies can be effectively deployed across all higher institutions.
2. Universities should organize continuous professional development programs to equip lecturers and academic staff with practical skills for integrating AI tools into teaching, assessment, and student support in ways that promote learner autonomy and SRL.

3. Higher education curricula should include modules on AI literacy, ethical AI use, metacognitive strategies, and self-regulated learning to prepare students for independent, AI-enhanced learning.
4. Clear policies and ethical frameworks should be established to guide the responsible use of AI in education focusing on data privacy, transparency, bias mitigation, and student consent.
5. Nigerian institutions and EdTech developers should collaborate to design AI tools that align with local languages, cultural realities, and educational objectives to enhance relevance and student engagement.
6. Faculty should shift from traditional teacher-centred instruction to student-centred pedagogies that integrate AI tools, encourage goal-setting, and promote reflective practices.
7. Universities should create dedicated units or help desks that support students in navigating and using AI tools effectively for academic planning, self-monitoring, and feedback interpretation.
8. AI-powered distance learning solutions should be deployed to extend quality learning opportunities to underserved areas, ensuring equity in access to AI-supported education.
9. Academic institutions should promote interdisciplinary research on AI applications in education and support pilot projects that evaluate their impact on student autonomy and learning outcomes.
10. Collaborations between universities, industry, government, and international organizations should be strengthened to provide technical expertise, funding, and policy support for sustainable AI integration in higher education.

References

AI ethics and higher education : Good practice and guidance for educators, learners, and institutions. (2022). In *Globethics.net eBooks*. https://doi.org/10.58863/20.500.12424/4146302

Anfara, V. A., Jr, & Mertz, N. T. (2014). *Theoretical frameworks in qualitative research*. SAGE Publications.

Ayanwale, M. A., Sanusi, I. T., Adelana, O. P., Aruleba, K. D., & Oyelere, S. S. (2022). Teachers' readiness and intention to teach artificial intelligence in schools. *Computers and Education Artificial Intelligence*, *3*, 100099. https://doi.org/10.1016/j.caeai.2022.100099

Bali, B., Garba, E. J., Ahmadu, A. S., Takwate, K. T., & Malgwi, Y. M. (2024). Analysis of emerging trends in artificial intelligence for education in Nigeria. *Discover Artificial Intelligence*, *4*(1). https://doi.org/10.1007/s44163-024-00163-y

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.

Chardonnens, S. (2025). Adapting educational practices for Generation Z: integrating metacognitive strategies and artificial intelligence. *Frontiers in Education*, *10*. https://doi.org/10.3389/feduc.2025.1504726

Chiu, T. K. F. (2023). The impact of Generative AI (GenAI) on practices, policies and research direction in education: a case of ChatGPT and Midjourney. *Interactive Learning Environments*, 1–17. https://doi.org/10.1080/10494820.2023.2253861

Chiu, T. K. F., Meng, H., Chai, C., King, I., Wong, S., & Yam, Y. (2021). Creation and evaluation of a pretertiary Artificial Intelligence (AI) curriculum. *IEEE Transactions on Education*, *65*(1), 30–39. https://doi.org/10.1109/te.2021.3085878

Eli-Chukwu, N. C., Igbokwe, I. C., Ifebude, B., Nmadu, D., Iguodala, W., Uma, U., Onyeneke, R. U., & Akudo, F. U. (2022). Challenges confronting e-learning in higher education institutions in Nigeria amid Covid -19. *Journal of Applied Research in Higher Education*, *15*(1), 238–253. https://doi.org/10.1108/jarhe-09-2021-0346

Ezekiel, O. B., & Akinyemi, A. L. (2022). Utilisation of Artificial Intelligence in education: The perception of University of Ibadan lecturers. *Journal of Global Research in Education and Social Science*, 32–40. https://doi.org/10.56557/jogress/2022/v16i58053

Ge, Z., & Hu, Y. (2020). Innovative application of artificial intelligence (AI) in the management of higher education and teaching. *Journal of Physics Conference Series*, *1533*(3), 032089. https://doi.org/10.1088/1742-6596/1533/3/032089

Goksel, N., & Bozkurt, A. (2019). Artificial intelligence in education. In *Advances in educational technologies and instructional design book series* (pp. 224–236). https://doi.org/10.4018/978-1-5225-8431-5.ch014

Gui, Y. M. L. M. L. (2021). Research on the integration of 5G+AI technology to empower digital education under the background of industrial Internet. *CONVERTER*, 399–407. https://doi.org/10.17762/converter.191

Hooda, M., Rana, C., Dahiya, O., Rizwan, A., & Hossain, M. S. (2022). Artificial intelligence for assessment and feedback to enhance student success in higher education. *Mathematical Problems in Engineering*, *2022*, 1–19. https://doi.org/10.1155/2022/5215722

Hwang, G., Xie, H., Wah, B. W., & Gašević, D. (2020). Vision, challenges, roles and research issues of Artificial Intelligence in Education. *Computers and Education Artificial Intelligence*, *1*, 100001. https://doi.org/10.1016/j.caeai.2020.100001

Jacob, O. N., & Babatunde, A. F. (2021). Challenges facing teaching and learning of educational administration and planning programme in Nigerian higher institutions and way forward. *Deleted Journal*, *7*, 76–87. https://ijcm.academicjournal.io/index.php/ijcm/article/view/57

Jin, S., Im, K., Yoo, M., Roll, I., & Seo, K. (2023). Supporting students' self-regulated learning in online learning using artificial intelligence applications. *International Journal of Educational Technology in Higher Education*, *20*(1). https://doi.org/10.1186/s41239-023-00406-5

Karlen, Y., Hirt, C. N., Jud, J., Rosenthal, A., & Eberli, T. D. (2023). Teachers as learners and agents of self-regulated learning: The importance of different teachers competence aspects for promoting metacognition. *Teaching and Teacher Education*, *125*, 104055. https://doi.org/10.1016/j.tate.2023.104055

Lee, D., Watson, S. L., & Watson, W. R. (2018). Systematic literature review on self-regulated learning in massive open online courses. *Australasian Journal of Educational Technology*, *35*(1). https://doi.org/10.14742/ajet.3749

Loeng, S. (2020). Self-Directed learning: a core concept in adult education. *Education Research International*, *2*, 1–12. https://doi.org/10.1155/2020/3816132

Miksza, P., & Elpus, K. (2018). Descriptive Research design. In *Oxford University Press eBooks*. https://doi.org/10.1093/oso/9780199391905.003.0003

Nguyen, A., Ngo, H. N., Hong, Y., Dang, B., & Nguyen, B. T. (2022). Ethical principles for artificial intelligence in education. *Education and Information Technologies*, *28*(4), 4221–4241. https://doi.org/10.1007/s10639-022-11316-w

Nkwenti, M., Babalola, S., Ferreira-Meyers, K., Kamanga, A., Kisirkoi, F., Jacobs, L., Oosthuysen, N., Wolhuter, C., Roberts, J., Mays, T., Mhlanga, E., Seeletso, M., Omidire, M., & Panda, S. (2023). *Does Distance Education in the Developing Context Need More Research? Building Practice into Theory (Volume Two)*. https://doi.org/10.35293/esi.24

Ogunode, N. J., & Edokhamhen, N. E. (2020). Teaching programme in Nigerian Higher Institutions: challenges of implementation and way forward. *Middle European Scientific Bulletin*, *6*, 86–93. https://doi.org/10.47494/mesb.2020.6.120

Onyejegbu, L. N. (2023). Challenges of Integrating AI Ethics into Higher Education Curricula in West Africa: Nigerian Universities Narrative. In *SpringerBriefs in ethics* (pp. 57–66). https://doi.org/10.1007/978-3-031-23035-6_5

Oyetola, S. O., Oladokun, B. D., & Dogara, K. (2024). LIS Educators' perception towards the adoption of AI tools in Nigerian library schools. *Metaverse Basic and Applied Research*, *3*, 65. https://doi.org/10.56294/mr202465

Pelikan, E. R., Lüftenegger, M., Holzer, J., Korlat, S., Spiel, C., & Schober, B. (2021). Learning during COVID-19: the role of self-regulated learning, motivation, and procrastination for perceived competence. *Zeitschrift Für Erziehungswissenschaft*, *24*(2), 393–418. https://doi.org/10.1007/s11618-021-01002-x

Petrie, C., Aladin, K., Ranjan, P., Javangwe, R., Tuominen, S., Gilliland, D., & Leponiemi, L. (2020). *Spotlight on quality education for all during Covid-19 crisis*. https://doi.org/10.58261/ciad8546

Sullivan, M., Kelly, A., & McLaughlan, P. (2023). ChatGPT in higher education: Considerations for academic integrity and student learning. *Journal of Applied Learning & Teaching*, *6*(1). https://doi.org/10.37074/jalt.2023.6.1.17

Teich, K., Loock, V. S., & Rummel, N. (2024). Meeting the challenges of continuing education online courses: Can we promote self-regulated learning strategies with adaptive support? *British Journal of Educational Technology*, *55*(4), 1437–1455. https://doi.org/10.1111/bjet.13453

Welch, J. K., & Patton, M. Q. (1992). Qualitative evaluation and research methods. *Modern Language Journal*, *76*(4), 543. https://doi.org/10.2307/330063

Xu, Z., Wei, Y., & Zhang, J. (2021). AI applications in education. In *Springer eBooks* (pp. 326–339). https://doi.org/10.1007/978-3-030-69066-3_29

Zhang, J., Liu, Y., Shu, T., Xiang, M., & Feng, Z. (2022). Factors associated with medical students' self-regulated learning and its relationship with clinical performance: a cross-sectional study. *BMC Medical Education*, *22*(1). https://doi.org/10.1186/s12909-022-03186-0

Zimmerman, B. J. (2000). *Attaining self-regulation: A social cognitive perspective*. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 13–39). Academic Press. https://doi.org/10.1016/B978-012109890-2/50031-7

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202559

Effect of Board Games on Achievement in Social Studies Concept among Public Primary School Pupils in Osun State, Nigeria

OLAIYA, Segun Maruf[1]
osmed2022@gmail.comm
08063663046

AJALA, Iyabo Romoke[1]
Romoke_ajala@unilesa.edu.ng
08055623027

AZEEZ, Sheu Quadri
sheu_azeez@unilesa.edu.ng
070622233443

TAIWO, Elizabeth Adebola
telizabeth355@gmail.com
08066872224

ADETOLUWA, Olayemi Oluwakemi
adetoluwayemi@gmail.com
08053229734

[1]Faculty of Education, University of Ilesa, Osun State, Nigeria

Abstract

The research was designed to find out Effect of Board Game on Achievement in Social Studies concept among public Primary School Pupils in Osun, State, Nigeria" The study adopted a pretest, posttest, control group quasi experimental research design. A purposive sampling technique was used in selecting 80 students from six selected schools in Osun State. Social studies Achievement Test (SSAT) with reliability coefficients of 0.85 was used to collect data, The instrument was validated by educational technology lecturers in the department of educational technology in university of Ilesa. One research question and three research hypotheses were generated and tested. mean, standard deviation, and Analysis of Covariance (ANCOVA) were used to answer the research questions and test hypothesis at 0.05 level of significance. Results revealed that the Board Game had a significant effect on students' achievement in social studies. The use of Game based strategy should therefore be encouraged in Nigerian schools to improve learning outcomes. The game is recommended as an appropriate and effective learning tool for developing social responsibilities in Nigerian Schools.
Keywords: Board Game, students' achievement, Social studies

Introduction

Throughout human history, and its attendant civilizations, education has a potent means of the agents of socialization and development of the citizens. Education has proven to be the only sustainable means of responding to the ever-changing needs of human society. The level of Nigeria's national development depends on how efficiently and effectively Nigerian society deploys its resources and educational structures to meet these needs. Although, it is truism that Nigeria needs are intractable and dynamic, the progressive and successful society ensure that the educational system responds to, or moves in tandem with its ever changing needs (Okon and Seabass 2023). Thus, education is essential to the individual as well as the community for its development. This is so because a nation cannot rise above the quality of its education, educational aims are channels towards meeting the needs of the particular nation in which it is given. Social Studies has a rich curriculum. Its contents are structured in such a way that, it is capable of developing the individual into a responsible citizen. The knowledge, attitude, values and skill needed in a social world are taught to learners at whatever level of the educational system in Nigeria. The discipline is an adaptive subject. It derives most of its contents from the Social Sciences.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202559

Social studies is a subject that blends together relevant learning experiences from the social sciences for the purpose of effective and productive teaching. Brunner in Nwalado (2020) insisted that Social Studies Education in Nigeria projects knowledge about people, their environment and the society in which this people live and interact socially, politically, economically, involving the use of diverse means of communication and social engagements. The authors agreed that Social Studies Education in Nigeria could achieve its goals by utilizing the knowledge (concepts) and skills that could be shifted from each and or all the social sciences to promote reasonable, dependable and reliable individual in their immediate and larger society. Scholars have written extensively on the concepts of social studies education and other related concepts. For instance, Michael M. Crow and William B. Dabars (2015). stated that the "concept of an educated man is incompatible with being narrowly specialized." A wholesome education has to do with what is valuable and of worth in the general sense. The fundamental thing is to find the type of experiences that are worth having not for the Moment, but because of what they lead to; the questions they raise, the problem they create, the demands for new information they suggest, the activities they invoke, the large expanding fields into which they continuously open. Consequently, Social Study is defined as the study of people in relationship to each other and their world. It focuses on people's relationship with their social, physical, spiritual, cultural, economic, political and technological environments. It teaches about human society, the past and presents, the way people interact with each other and the environment and how government works.

In a similar vein, Social Studies can also be defined as the integrated study of the social sciences and Humanities to promote civic competence. It uses integrated approach to equip its learners with skills and knowledge to make them become active and responsible citizens. Social Studies Education is said to be inter-discipline and integrated because it draws upon many subjects including Sociology, Political Science, History, Economics, Religious studies, Geography. Psychology, Anthropology and Civics Okon, C. E., and Nseabasi, A. S (2023). Hence, Social Studies education tackles issues that are challenging to man, such issues include: poverty, crime, public health, technology, international communities, HIV/AIDS, social cultism, terrorism, militancy, communal and religious crises, socio-political crises, vandalism, corruption among others. The subject also focuses on man's interaction and relationship with one another and the environment. It studies human behavior, past and recognizes differences in cultures and religions. Man is always in constant relationship with fellow human beings as well as his natural and man-made environments. The scope of Social Studies Education includes Civic Education. This implies that, Social Studies as a subject that imparts skills, knowledge and attitude required of learners to be good and responsible citizens. Learners learn about government; how it operates, democracy, rights and responsibilities of citizen's rule of law and public affairs. (Okon and Nseabasi, 2023). Objectives of Teaching and Learning of Social Studies Education The proper articulation of the aim and objectives of Social Studies has continued to enhance the popularity of the subject. Nnamani and Oyib (2016). the Nigeria Social Studies programme was meant to realize the following objectives. (i) to improve and broaden the basis of Nigerian educational system which has been criticized from time to time as narrow and unimaginative; (ii) to help Nigeria teachers, pupils and students to discover what is good and unique in the physical, social, economic and cultural traditions which hitherto have been implied or neglected. (iii) to develop, encourage and strengthen enquiring minds in pupils and students.

Sustainable development according to Bruthland Commission (1987) is the “development that meets the needs of the present without compromising the ability of the future generations to meet their own needs”. Sustainable development as opined by Ajayi and Afolabi (2009) entails better living conditions for all citizens; producing more nutritious and very sumptuous food for all citizens to eat; individuals living healthier, happier and more comfortable life; sound education and enlightenment among the populace; improved transportation and communication system; scientific and technological advancement, gainful employment for all citizens. United National Millennium Development Goals (MDGs) showed that countries lagging behind including Nigeria, were hindered by inability to deliver service effectively and efficiently to the grassroots or community level (Ejiogu, 2015 and Ki-moon, 2015). Adams (2006) presented an illustrated definition of sustainability with special reference to the three pillars of social, environmental and economic sustainability. According to Ban Ki-moon (2015), the MDGs No. 2 on achieving universal primary education has laid foundation for the new sustainable development goals (SDG) No. 4 on inclusive education for sustainable development. The country’s failure in the past twenty-two (22) years is a direct result of poor leadership. Some indices of social sustainability in the country in the country are mortality rate (maternal and infant), unemployment, literacy rate. A game can be described as pleasurable activities that are performed within particular rules, for a limited time and in place, in which individuals participate voluntarily, carried out with mental and physical abilities and gained some social behaviors. Games and mental health encompass the complex interplay between play, game-related activities, and psychological well-being throughout human development. Play is recognized as a fundamental activity that facilitates learning, social interaction, and emotional expression across the lifespan. As children engage in games, they not only develop cognitive

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202559

and motor skills but also navigate social dynamics and emotional challenges, reflecting their developmental stage. This engagement can promote identity development and serve as an essential outlet for stress relief and social bonding. Games are very important for physical, mental and emotional development. A game as an educational tool can be a good idea, as with any kind of learning the most important challenge is to spur interest in learners. It ensures that the end result is enjoyable and fun rather than just reading a textbook. An educational game is a game designed to teach people, typically children, about a certain subject or to help them learn a skill as they play the game. Some people call these types of games "edutainment" because they combine education and entertainment. Educational games will train the child's ability to solve problems and think logically (Lee et al.,2014). According to Adipat et al.,(2021) games are fun activities that promote interaction, thinking, learning, and problem solving strategies. The young learners can learn about healthy competition or fair play, since they must follow the instruction and the rule of the game. Byusa, et al (2022) described game as pleasurable activities that are performed within particular rules, for a limited time and in place, in which individuals participate voluntarily, carried out with mental and physical abilities and gained some social behaviors. Games are very important for physical, mental and emotional development.

Snakes and Ladder is an example of board games. It is a popular board game around the world. The Snake and Ladder game is believed to have originated in 2nd century B.C. in India by the name of "Paramapada Sopanam" (*Ladder to Salvation*) (Bornet and Burger (2012)). The game was developed by teachers and marketed as a children's game. Snake and ladder is a classic board game. Its main attraction is that some parts of the board are represented by ladders and snakes. It needs a dice in order to play the game and take turns and the board is numbered from 1 to 100 according to the total cells in the board. When the dice results in a position with a snake, the user is" pulled down" and reaches the other end of the snake—thus slowing down the progress to traverse the entire board. The ladder, on the other hand promotes the user to a higher position. This basic game has been adapted to be an educational game in which players answer questions while playing. The game of Snakes and Ladders facilitates learning about counting, life, interaction and socialization. In this game, implicitly, the students can learn about the ups and downs in life or about joys and troubles. In addition, the young learners also learn about fair play, patience, and how to take turn. As a result, therefore, the study set out to design Snake and Ladder game to teach and reinforce social studies concept in the JSS 2 social studies curriculum. It was hoped that playing the game, which requires working together in a team or group would develop learners' ability to socialize with one another amongst other outcomes. The rule guiding Snake and Ladders game was applied in this study.

In spite of the number of teaching pedagogy which we have identified in social studies, teaching based on a board game has come to be adopted in this paper because of its effectiveness in teaching. It can also be seen as "a teaching pedagogy were the teacher and the students are allowed to examine an idea, event, issues, problems and questions freely, with minimum guidance from the teacher and then seek information to answer or solve the problem. In using this method, students are not just fed with information but are made to be active in the-learning situation. Unlike other traditional methods of teaching where the learners are passive, teaching with this Snakes and Ladders Game is more effective because the learners participate fully in the teaching and learning. Differences between boys and girls in time spent playing games seem to decrease (Nguyen et al., 2022)). Boys not only spend more time playing games than girls, they also prefer to play different kinds of games. Boys tend to prefer action games (First Person Shooters, fighting, and sports games), while girls show a preference for playing simulations (virtual world and virtual life games) and puzzle games. No gender differences are found with most other genres, such as role-play games and adventure games (Taylor and Francis 2014). These differences in preferences between boys and girls seem to be related to a different motivation to play games. Boys tend to be more motivated to outdo other players (performance-only or performance combined with mastery-achievement goals), while girls are less motivated by both performance and mastery-achievement goals.

The Nigerian society is characterized by high level of distrust and suspicion and nearly everybody has become a suspect of misplaced value. Immorality and lack of sanctity of life have increased. Vices such as murder, kidnapping for ransom and ritual have become the order of the day that pervades Nigerian society; with patricide, matricide, infanticide, fratricide and even suicide all in pursuit of materialism. Endemic corruption has polluted the character and personality of every Nigerian. The importance of positive value orientation for any nation's development cannot be over emphasized. Vices have taken the place of virtues while merit is damaged or denuded. These negative values have replaced the positive values needed for sustainable The Need for Value and Attitudinal Re-orientation through Social Studies Education The need for attitudinal and value re-orientation has for long been recognized as the best way to address the myriads of societal problems confronting the Nigerian society. Consequently, successive administrations have articulated and pursued re-orientation programmes in one form or the other. It is regrettable, however, that despite all the attempts, programmes and interventions nothing can be seen in concrete

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202559

terms. These vices can only be eradicated if Social Studies is well taught in schools most especially with the use of instructional materials that will facilitate effective and efficient lesson delivery in class which can lead to attitudinal change. This study therefore examined the effects of board game (based on the principles of Snakes and Ladders game) on the achievement of primary five pupils in some selected topics in Social Studies.

Research Question

What is the mean difference in achievement scores of pupils taught social studies using board games and those exposed to traditional method in Osun State?

Hypotheses

Ho_1: There is no significant mean difference between the mean difference in achievement scores of pupils taught social studies using board games and those exposed to traditional method in Osun State

Ho_2: There is no significant mean difference between the mean difference in achievement scores of male and female pupils taught social studies using board games in Osun State

Ho_3: There is no significant interaction effect of treatment and Gender on achievement scores of pupils taught social studies using board games in Osun State

Methodology

The study used a pretest, posttest, control group quasi experimental research design. A purposive sampling technique was used in selecting 80 students from six selected school in Osun State. Social Studies Achievement Test (SSAT), This instrument was developed and validated with reliability coefficient of 0.85. The level of comprehension of the students was tested on the following topics: meaning of democracy, pillars of democracy, election, voter's responsibilities and electoral malpractices. The test contains 20 multiple choice objective test items. It has two sections (a) containing demographic information such as name of school, students name, class, gender, age (b) contains the constructed test items, the options for the questions ranges from A to D. Two marks were awarded for each correct option and zero for wrong option and the total score was 60 marks. The questions covered the six levels of cognitive domain, that is, knowledge, comprehension, application, analysis, synthesis and evaluation. The Snakes and Ladders Board Game is the board game designed and validated by the teachers in secondary schools and instructional media technologist Served as an instructional material used to teach the experimental group. The board has 100 square boxes numbered from 1 to 100. The player starts by rolling a dice in order to know the box where to commence the game, the players move along until they encounter a ladder or snake. If a player lands at the tip of the snake's head, the group will be asked social studies related question by the question master, if they get the question right, they stay on the square if not they slide down to the square at the snake tail. If a player lands on a square that is at the base of a ladder, the group will be asked a social study related question by the question master, if right answer is given then move to square at the top of the ladder and continue from there

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202559

Question Bank

The Question Bank that contains items (related content) on the following topics; Influence of man on his environment, Other people in the family, Obligations and importance of tolerating other people in the family, Meaning and characteristics of responsible parenthood, Value that promote responsible parenthood are playing tools for the snake and ladder board. Options for the questions range from A to D. Students ascend by picking correct option while a wrong option leads to their descent.

Card: 1

1. **Which of the following is a negative effect of human activity on the environment?**
A. Planting trees
B. Building drainage
C. Bush burning ✓
D. Digging wells

Card: 2

7. **One role of children in the family is to:**
A. Give orders
B. Obey rules ✓
C. Punish others
D. Ignore parents

The board game and the materials for playing the game were validated by experts, Social studies professional teachers and educational media technologist for content and packaging. Based on their corrections and comments, necessary corrections were done by the researcher which made the game suitable for the study. Social Studies achievement Test (SSAT) was trial tested on 20 students apart from those used for the main study. The research was carried out for a period of twelve weeks: three weeks for pre- test, six weeks for treatment and three weeks for post-test. Data was analyzed using mean, standard deviation and Analysis of Co-variance (ANCOVA).

Presentation of Results

Research Question 1: What is the mean difference between the students exposed to the experimental group (Snake and Ladder Board game) and control group (Traditional Method)?

Table 3 Summary of the mean difference between the experimental and control groups in achievement scores

	N	Mean	Std. Deviation
Pre test score	80	27.46	9.026
Post test score	80	34.67	12.740
Means diff		7.21	

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202559

The mean score of students (34.67) exposed to the intervention is higher than the mean score of those exposed to the Conventional method of teaching (27.46). The implication of this is that the treatment or intervention is effective and capable of improving academic performance of students in Social Studies

Ho_1 There is no significant mean difference between the mean difference in achievement scores of pupils taught social studies using board games and those exposed to traditional method in Osun State

Table 4 Summary of Analysis of covariance of posttest, achievement by treatment

Source	sum of square	df	mean square	f	sig	partial eta square
Corrected Model	10803.311	4	2700.828	100.366	.000	.843
Intercept	1885.820	1	1885.820	70.079	.000	.483
Pretest	2420.761	1	2420.761	89.958	.000	.545
Group	1916.478	1	1916.478	71.218	.000	.478
Gender	1740.727	1	1740.727	64.687	.000	.463
Group * Gender	1796.465	1	1796.465	66.759	.000	.471
Error	2018.239	75	26.910			
total	109010.000	80				
Corrected Total	12821.550	79				

Significant at P<.05

The table 4 shows that after adjusting for pretest scores, treatment had significant main effect on students' achievement in social studies in some selected topics ($F_{(1,2018)}$ =71.218; $p < 0.05$). This implies that the treatment contributed better to the performance of JSS2 students in some selected topics in social studies.

Ho_2: There is no significant mean difference between the mean difference in achievement scores of male and female pupils taught social studies using board games in Osun State

Table 5 **Summary of Analysis of covariance of posttest, achievement by gender**

source	sum of square	df	mean square	f	sig	partial eta square
corrected model	10803.311	4	2700.828	100.366	.000	.843
intercept	1885.820	1	1885.820	70.079	.000	.483
pretest	2420.761	1	2420.761	89.958	.000	.545
group	1916.478	1	1916.478	71.218	.000	.478
gender	1740.727	1	1740.727	64.687	.000	.463
group * gender	1796.465	1	1796.465	66.759	.000	.471
error	2018.239	75	26.910			
total	109010.000	80				
corrected total	12821.550	79				

The table 5 shows that after adjusting for pretest scores, gender had a significant main effect on students' achievement in some selected topics in Social studies ($F_{(1,2018)}$ =64.687; $p > 0.05$). The result shows that gender contributed to learning outcome of students in some selected topics in Social Studies

Ho_3: There is no significant interaction effect of gender and treatment on student achievement in some selected topics in Social Studies

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202559

Table 6 Summary of Analysis of covariance of posttest, achievement by gender and treatment

Source	sum of square	df	Mean square	f	sig	partial eta square
Corrected Model	10803.311	4	2700.828	100.366	.000	.843
Intercept	1885.820	1	1885.820	70.079	.000	.483
Pretest	2420.761	1	2420.761	89.958	.000	.545
Group	1916.478	1	1916.478	71.218	.000	.478
Gender	1740.727	1	1740.727	64.687	.000	.463
Group * Gender	1796.465	1	1796.465	66.759	.000	.471
Error	2018.239	75	26.910			
Total	109010.000	80				
Corrected Total	12821.550	79				

The table 6 shows that after adjusting for pretest scores, the interaction between treatment and gender had significant effect on students' achievement in some selected topics in Social Studies ($F_{(1, 2018)} = 5.997$; $p < 0.05$). There is a positive effect on the interaction of gender and treatment on the learning performance of students in Social Studies

Discussion of findings

Summary of the mean difference between the experimental and control groups in students' posttest achievement scores, indicates that the treatment had improved posttest achievement scores for the experimental group over the posttest achievement scores of students in the control group that was exposed to conventional method of teaching. This shows that Snakes and Ladder board game had significant effect on the achievement Primary five Pupils learning outcomes in some selected topics in social studies. The theoretical implication of this result is that using board games could promote effective teaching and learning of Social Studies than the conventional method.

This result confirms with previous studies that have been carried out on the effectiveness of simulation games. Olaiya (2016) compared the lessons thought by traditional methods and lessons taught by using the games and observed that using games in lessons increases students' motivation as well as social and academic abilities. Hung et al., (2014) conducted a research on Effects of digital game-based learning on students' self-efficacy, motivation, anxiety, and achievements in learning mathematics .To evaluate the effectiveness of the proposed approach, an experiment was carried out on an elementary school mathematics course with quasi-experimental research design. The experimental results show that the game-based e-book learning model effectively promoted the students' learning achievement, self-efficacy, and motivation of mathematics. Akande (2017) carried out a quasi-experimental research design of pre-test and post-test control group on the topic; 'Effects of Mathematical games on the academic achievement of senior secondary school students in Nasarawa state'. The findings revealed that the students taught with the use of games had a greater mean score than their counterparts taught without the use of games.

Imoko and Isa (2015) embarked on quasi-experimental research using the pre-test and post-test on Impact of computer games on pupil's achievement in mathematics in primary school. The analysis of the data showed that the use of games learning approach improved significantly pupil's achievement in mathematics. Some studies may measure game-based math achievement of males versus females; whereas, others measure math achievement and teacher competency. The results of various studies in non-experimental, correlational analysis show that hands-on game scores and attitudes toward mathematics aligned significantly to students' scores on mathematical tests (Jong, 2015). The outcomes of quasi experimental control-group design show that students utilizing game-based learning repeatedly outperformed the students who did not utilize game-based learning (Tobias et al., 2014). Researchers contended that executing game-based learning to support education is critical to student achievement (Hsieh et al., 2016). Students become intrinsically motivated and register improvements on various attributes, including critical thinking, problem-solving, creativity, innovation, and communication. It is evident that Snakes and Ladders board games had significant effects on the achievement of Primary five Pupils in some selected topics in Social Studies. The summaries of ANCOVA shows that the treatment (Snakes and Ladders board game) had improved posttest achievement

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202559

score compared to the control group (Conventional method). Furthermore, there was no significant difference between the achievement scores of male and female students. This may be because female like board game more than male, female s are more interested in a fun filled atmosphere than male. The interface of the game was also attractive to the students and this promoted the acceptability of the game by both gender. The game is also easy to play as does not require special skills before it can be played. The interaction of both gender and treatment had positive effect on the performance of students in some selected topic in civic education. This finding reveals that treatment and gender are two factors that can contribute to academic development of Social Studies.

Conclusion

The students' mastery of Social Studies concepts was promoted because game motivated the students' interest in learning Social studies, it provided alternative ways to help the students to learn Social Studies topics. It also promoted child centered learning because the students were actively involved in the teaching and learning process. Thus, game made teaching and learning more fun and this assisted the students to master the newly taught concept faster

Recommendations

1. **Integration of Game-Based Strategies into Primary School Curriculum:**
   Educational stakeholders should incorporate game-based learning tools such as board games into the Social Studies curriculum at the primary level to enhance pupils' academic achievement and engagement.
2. **Capacity Building for Teachers on Game-Based Learning:**
   Regular workshops and in-service training programs should be organized for Social Studies teachers to equip them with the skills to design, implement, and evaluate game-based instructional strategies effectively.
3. **Policy Support for Innovative Teaching Methods:**
   The Ministry of Education and relevant agencies should formulate and implement policies that promote the use of interactive and innovative teaching methods especially board games as part of instructional practices in Nigerian primary schools.
4. **Development and Distribution of Educational Board Games:**
   Educational technology experts and instructional designers should collaborate with curriculum developers to create contextually relevant and age appropriate board games tailored to the Nigerian Social Studies syllabus.
5. **Further Research on Game-Based Learning Across Subjects and Demographics:**
   Researchers should investigate the effectiveness of board games and other game-based learning strategies across different subjects, regions, and learner characteristics (e.g., gender, socio-economic status) to build a broader evidence base for their application in Nigerian schools.

References

Adipat, S., Laksana, K., Busayanon, K., Asawasowan, A., & Adipat, B. (2021). Engaging students in the learning process with game-based learning: The fundamental concepts. *International Journal of Technology in Education (IJTE), 4*(3), 542–552. https://doi.org/10.46328/ijte.169

Akande, M. (2017). *Effects of mathematical games on the academic achievement of senior secondary school students in mathematics in Abuja, Nigeria*.

Bornet, P., & Burger, M. (2012). *Religions in play: Games, rituals, and virtual worlds* (p. 94). Theologischer Verlag Zürich. https://books.google.com/books?id=t3X18dopUoMC

Brandt, C., Evans, C., & Domaleski, C. (2025). *Assessing 21st century competencies: Guiding principles for states and districts*. National Center for the Improvement of Educational Assessment.

Byusa, E., Kampire, E., & Mwesigye, A. R. (2022). Game-based learning approach on students' motivation and understanding of chemistry concepts: A systematic review of literature. *Heliyon*.

Connolly, C. P., Boyle, E. A., Hainey, T., & Boyle, J. M. (2016). Game-based learning and 21st century skills: A review of recent research. *Computers in Human Behavior, 63*, 50–58. https://doi.org/10.1016/j.chb.2016.05.023

Edinyang, S. D., Effiom, V. N., Effiom, J. E., & Doris, U. (2020). Assessment of implementation of social studies curriculum for effective citizenship in upper basic education of Cross River State of Nigeria. *European Journal of Social Sciences, 59*(1), 63–77.

Hsieh, Y. H., Lin, Y. C., & Hou, H. T. (2016). Exploring the role of flow experience, learning. http://dx.doi.org/10.1016/j.chb.2015.07.045

Huang, T. T. (2016). *The effects of types of reflective scaffolding and language proficiency on the acquisition of physics knowledge in a game-based learning environment* (Doctoral dissertation, New York University).

Michael, M. C., & Dabars, W. B. (2015). *Designing the new American university*. Johns Hopkins University Press.

Nguyen, H. A., Hou, X., Richey, J. E., & McLaren, B. M. (2022). The impact of gender in learning with games: A consistent effect in a math learning game. *International Journal of Game-Based Learning, 12*(1). https://doi.org/10.4018/IJGBL.20220101.oa2

Nnamani, S. C., & Oyibe, O. A. (2016). Achieving Nigerian educational objectives through effective social studies instruction. *IOSR Journal of Research & Method in Education (IOSR-JRME), 6*(4).

Nwalado, E. N. (2020). *Methodology of social studies curriculum*. Enugu: Chembus Communication Ventures.

Okon, C. E., & Nseabasi, A. S. (2023). Social studies education as a tool for Nigeria's national development. *AKSU Journal of Social Sciences (AJSS), 3*(1), 86–92.

Olaiya, S. M., Akinyemi, A. L., & Aremu, A. (2017). Effect of a board game: Snakes and ladders on students' achievement in civic education. *Journal of Nigeria Association for Educational Media and Technology (JEMT), 21*(2).

Plass, J. L., Homer, B. D., & Kinzer, C. K. (2015). Foundations of game-based learning. *Educational Psychologist, 50*(4), 258–283. https://doi.org/10.1080/00461520.2015.1122533

Shaffer, D. W. (2010). Looking where the light is bad: Video games and the future of assessment [Technical report]. University of Wisconsin–Madison. https://www.researchgate.net/publication/303856565

Simeon, N. A., & Koroye, I. S. (2024). Educational value system and its implications in Nigeria. *International Journal of Law, Politics and Humanities Research*.

Taylor, & Francis. (2014). Gender-inclusive game-based learning in secondary education. *International Journal of Inclusive Education, 18*(11). https://doi.org/10.1080/13603116.2014.885592

Ugwu, T. C., & Umennaike, C. (2021). Value reorientation among Ndịigbo: The role of teacher education. *Journal of Teacher Perspective, 16*(1).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202560

Qualitative Study on Integrating Policies, Practices and Pedagogy on Inclusive Education among Preservice Teacher Training Programs in Nigeria

Yusuf, Zainab
zainabyusuf@kasu.edu.ng

Educational Foundations Department, Kaduna State University, Nigeria

Abstract
This paper explores the Qualitative study on integrating Policies, Practices and Pedagogy on Inclusive Education among Preservice Teacher Training Programs in Nigeria. As Nigeria seeks to improve equitable access to quality education for all learners, pre-service teacher training programs must equip future educators with the skills, attitudes, and understanding necessary to foster inclusivity in classrooms. Through an analysis of current policy frameworks, educational practices, and pedagogical challenges, this study identifies critical gaps and provides actionable recommendations for developing a robust inclusive education model in Nigerian teacher training institutions. The implications for policy adaptation and curriculum reform were discussed in light of global best practices and Nigeria's unique sociocultural context.
Keywords: Inclusive Education, Pre-service Teacher Training, Policy Implementation, Disability, Educational Equity

Introduction
Inclusive education aims to ensure that every learner, irrespective of their physical, cognitive, socio-emotional, or economic differences, has access to quality education in a supportive environment (UNESCO, 2021). In Nigeria, although inclusive education has been emphasized in the National Policy on Education (Federal Republic of Nigeria, 2013), the adoption and practical application of these principles in pre-service teacher training programs have been limited (Afolabi & Ojo, 2022). As future educators, pre-service teachers must be equipped to address diverse needs within classrooms, including those of students with disabilities, marginalized communities, and varying learning abilities (Akinyele et al., 2020). Integrating inclusive education policies, practices, and pedagogical approaches in pre-service training is critical to addressing the disparities in Nigeria's educational sector and promoting social equity (Baba & Ahmad, 2021). Nigeria's commitment to inclusive education began with the enactment of policies such as the Universal Basic Education Act, which emphasizes educational access for all (Federal Republic of Nigeria, 2004). Furthermore, the National Policy on Education was revised to incorporate provisions supporting inclusive education (Federal Republic of Nigeria, 2013), with Kaduna State passing into law The Kaduna State Disability Law 2023, as well as Lagos State. However, the implementation has faced numerous challenges, including limited funding, inadequate teacher preparation, and societal stigma toward disabilities (Baba & Ahmad, 2021). Ozoji (2022) notes that without concrete strategies to bridge the gap between policy and practice, inclusive education goals will remain unfulfilled in Nigeria.

Bronfenbrenner's Ecological Systems Theory
Bronfenbrenner's Ecological Systems Theory posits that individuals are influenced by multiple layers of their environment, ranging from immediate settings (like family and school) to larger societal influences (Bronfenbrenner, 1979). According to this theory, inclusive education requires supportive structures at each level: from micro-level (classroom practices and teacher attitudes) to macro-level (educational policies and cultural beliefs about disability) (Bronfenbrenner & Morris, 2006). This model emphasizes that creating an inclusive school environment depends not only on the classroom but also on the family, school administration, and broader community. For instance, if a school operates within a community that values inclusivity, it is more likely to adopt policies and practices that support students with disabilities (Tudge et al., 2009).

Vygotsky's Sociocultural Theory
Vygotsky's Sociocultural Theory emphasizes the social context of learning and the importance of interactions between learners and more knowledgeable others (Vygotsky, 1978). In an inclusive classroom, this theory supports collaborative learning, where peers and teachers work together to support students with diverse abilities. The idea of the "Zone of Proximal Development" (ZPD) is central here; it suggests that students can achieve higher levels of understanding with appropriate support, such as differentiated instruction or peer tutoring (Daniels, 2005). This theory underpins inclusive practices by advocating for scaffolding and personalized support that respects each student's unique learning process (Gindis, 1999).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202560

Critical Disability Theory

Critical Disability Theory (CDT) challenges traditional perspectives on disability, viewing it as a social construct rather than an inherent limitation (Goodley, 2013). CDT emphasizes the need to critically examine power dynamics, marginalization, and ableism in educational systems, urging educators to question how curriculum, teaching practices, and policies can exclude certain groups of students (Meekosha& Shuttleworth, 2009). This theory calls for an examination of the biases that contribute to inequities in education and advocates for an approach that values diversity and acknowledges the agency of individuals with disabilities. By focusing on social justice, CDT helps to shift the focus of inclusive education from merely accommodating students with disabilities to actively restructuring educational systems for equity (Erevelles, 2000). These theories complement each other in advocating for inclusive education, highlighting how multiple factors—ranging from individual interactions to societal structures—can impact a learner's experience in the classroom. By addressing environmental, social, and systemic barriers, they contribute to a more holistic understanding of inclusive practices. Research on inclusive education in developing countries reveals both promising practices and persistent challenges, particularly related to accessibility, teacher training, policy implementation, and societal attitudes towards disability. Studies from various contexts underscore how social, economic, and cultural factors uniquely shape the inclusivity of educational systems in these regions.

Accessibility and Resources

A significant barrier to inclusive education in developing countries is the lack of resources and infrastructure. For instance, in a study conducted across several low-income regions in Africa, Boissiere (2004) found that the scarcity of resources—such as assistive technologies, accessible school facilities, and educational materials tailored to different learning needs—limits the quality of inclusive education. This shortage often results in overcrowded classrooms, inadequate instructional materials, and limited support services, all of which hinder the effectiveness of inclusive practices (Boissiere, 2004). Similarly, Ahmed (2018) studied inclusive education practices in Bangladesh and found that the availability of resources was crucial for the successful implementation of inclusive policies. In this context, limited funding led to poor school facilities, which were not conducive to the needs of students with disabilities. Ahmed suggested that improving access to resources and making classrooms physically accessible are essential steps toward better inclusivity (Ahmed, 2018).

Teacher Training and Professional Development

Teacher preparedness is another critical factor in developing inclusive education. Research indicates that educators in developing countries often lack specialized training in inclusive practices, making it challenging to meet the diverse needs of learners. In a study conducted in Kenya, Mugo, Oriende, and Sang (2016) highlighted that teachers frequently reported feeling underprepared to address the educational needs of students with disabilities due to a lack of professional development opportunities. They argued that without adequate training in areas like differentiated instruction and Universal Design for Learning, teachers struggle to create supportive learning environments (Mugo, Oriende, & Sang, 2016). Similarly, in Nigeria, Oluremi (2015) found that teachers' attitudes toward inclusive education were largely influenced by their level of training and experience with inclusive practices. The study noted that teachers who had received even limited training in special education were more likely to support inclusive practices and to believe in the capacity of students with disabilities to succeed academically. This highlights the importance of training as a means of positively influencing teacher perceptions and promoting more inclusive classrooms (Oluremi, 2015).

Global Standards for Inclusive Teacher Education

Globally, inclusive education has gained prominence as a cornerstone of quality education under the Sustainable Development Goals (SDGs), specifically SDG 4, which aims to "ensure inclusive and equitable quality education for all" (UNESCO, 2021). International frameworks, such as Universal Design for Learning (UDL) and Differentiated Instruction, offer adaptable strategies to support diverse learners, providing benchmarks for countries like Nigeria to develop inclusive teacher training programs (Akinyele et al., 2020).

Pedagogical Approaches in Inclusive Education

Effective inclusive education relies on pedagogies that support diverse learning needs, such as differentiated instruction, active learning strategies, and the UDL model (Rose & Meyer, 2002). These approaches allow teachers to cater to the various abilities and learning styles of students, thus ensuring that no student is left behind. In Nigeria, however, pre-service teacher training often focuses on traditional lecture-based methods, with limited exposure to inclusive pedagogical approaches (Afolabi & Ojo, 2022). Adapting teaching methodologies to include hands-on, student-centered learning can better prepare teachers to manage inclusive classrooms (Ozoji, 2022).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202560

Methodology

This study employs a qualitative research approach, drawing on data from policy documents, curriculum reviews, and interviews with teacher educators and pre-service teachers. Through document analysis, this paper examines the extent to which inclusive education principles are embedded within Nigeria's teacher training curricula. Interviews with stakeholders, including educators and education policymakers, provide insights into the challenges and perceptions surrounding inclusive education practices in Nigeria.

Discussion of Findings

1. **Policy Integration in Pre-Service Teacher Training**

   A review of Nigeria's National Policy on Education indicates a commitment to inclusive education but lacks explicit guidelines on how to operationalize these principles within teacher training curricula (Federal Republic of Nigeria, 2013). Current teacher education curricula in Nigerian universities and colleges often do not include comprehensive modules on inclusive education, which would cover topics like disability awareness, culturally responsive teaching, and adaptive teaching methods (Akinyele et al., 2020). Baba and Ahmad (2021) argue that the absence of clear, enforceable guidelines results in fragmented adoption of inclusive practices, leaving pre-service teachers inadequately prepared for diverse classrooms.

2. **Incorporation of Inclusive Pedagogies**

   Inclusive pedagogies such as UDL and differentiated instruction remain underutilized in Nigerian teacher training programs. The UDL framework, which emphasizes providing multiple means of engagement, representation, and expression, is especially suitable for meeting the needs of diverse learners in Nigerian classrooms (Rose & Meyer, 2002). However, studies show that most pre-service teachers receive little to no training on UDL or other inclusive methodologies (Ozoji, 2022). Akinyele et al. (2020) suggests that integrating practical, hands-on training in these inclusive pedagogies can improve pre-service teachers' confidence and competence in addressing diverse learning needs.

3. **Attitudinal Challenges and Awareness Gaps**

   Interviews with teacher educators and pre-service teachers reveal a significant challenge: the perception of inclusive education as a secondary priority or an "extra responsibility" rather than a core component of effective teaching (Baba & Ahmad, 2021). This negative perception is often reinforced by limited exposure to inclusive practices and societal stigmas around disability and special needs. Developing positive attitudes toward inclusion requires not only curriculum changes but also targeted awareness programs that highlight the benefits of inclusive education for all students (Afolabi & Ojo, 2022).

4. **Structural Barriers and Resource Constraints**

   Structural challenges such as inadequate funding, lack of specialized resources, and insufficiently trained faculty hinder effective implementation of inclusive teacher training programs. Ozoji (2022) notes that teacher training institutions in Nigeria face substantial resource constraints, limiting their ability to provide practical training in inclusive education. Furthermore, insufficient access to assistive technology and adaptive learning materials prevents pre-service teachers from gaining firsthand experience in inclusive practices (Akinyele et al., 2020)

Conclusion

Integrating policies, practices, and pedagogies of inclusive education within Nigerian pre-service teacher training programs is essential to promoting equitable education for all students. By reforming curricula, supporting faculty, and encouraging positive attitudes toward inclusion, Nigeria can build a foundation for inclusive education that addresses the diverse needs of its student population. Implementing these recommendations will not only improve the quality of teacher education but also contribute to Nigeria's broader goals of achieving educational equity and social inclusion.

Recommendations

1. **Enhance Policy Frameworks for Inclusive Education**

   Policymakers should strengthen Nigeria's inclusive education policies by incorporating specific mandates for pre-service teacher training programs. Clearer guidelines and standardized benchmarks for inclusive education in pre-service curricula can ensure that all teacher candidates receive adequate preparation for diverse classrooms (Federal Republic of Nigeria, 2013).

2. **Redesign Teacher Training Curricula**

   Teacher training programs should incorporate modules on UDL, differentiated instruction, and other inclusive pedagogies as core components rather than optional additions (Rose & Meyer, 2002). Additionally, integrating culturally responsive

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202560

teaching approaches can help pre-service teachers address the unique needs of Nigeria's multicultural student population (Akinyele et al., 2020).

3. **Faculty Development and Resource Allocation**
   Providing faculty with training on inclusive education and adaptive teaching methodologies can improve the quality of teacher training programs. Collaborative partnerships with international organizations and government agencies can help secure the necessary resources for implementing inclusive education training modules (Ozoji, 2022).
4. **Community Engagement and Policy Advocacy**
   Promoting a culture of inclusivity requires active engagement with communities, policymakers, and educational institutions. Collaborative efforts involving parents, educators, and policymakers can raise awareness and reduce the stigma associated with inclusive education, fostering a supportive environment for inclusive practices in teacher training institutions (Baba & Ahmad, 2021).

References

Afolabi, A., & Ojo, M. (2022). Perceptions and practices of inclusive education in Nigerian teacher training programs. Journal of Special Education and Rehabilitation, 18(2), 45–60.

Akinyele, O., et al. (2020). Strategies for integrating inclusive pedagogy in Nigerian teacher education. African Journal of Educational Development*, 15(1), 120–134.

Baba, M., & Ahmad, I. (2021). Policy and practice of inclusive education in Nigeria: Challenges and prospects. Nigerian Journal of Education, 27(4), 223–238.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Harvard University Press.

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner (Ed.), *Handbook of child psychology: Theoretical models of human development* (6th ed., Vol. 1, pp. 793–828). Wiley.

Federal Republic of Nigeria. (2004). *Universal Basic Education Act*. Abuja: Federal Ministry of Education.

Federal Republic of Nigeria. (2013). National Policy on Education. NERDC Press.

Ozoji, B. (2022). Inclusive education policy implementation in Nigeria: A critical review. Nigerian Journal of Educational Psychology, 14(3), 102–117.

Rose, D. H., & Meyer, A. (2002). Teaching every student in the digital age: Universal Design for Learning. ASCD.

Ozoji, E. D. (2022). *Bridging the gap between inclusive education policy and classroom practice in Nigeria*. International Journal of Special Needs Education, 15(2), 88–102.

Tudge, J. R. H., Mokrova, I., Hatfield, B. E., & Karnik, R. B. (2009). Uses and misuses of Bronfenbrenner's bioecological theory of human development. *Journal of Family Theory & Review*, 1(4), 198–210. https://doi.org/10.1111/j.1756-2589.2009.00026.x

UNESCO. (2021). Global education monitoring report 2021: Inclusion and education – All means all. UNESCO.

UNESCO. (2021). *Understanding inclusive education: A global overview*. United Nations Educational, Scientific and Cultural Organization.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202561

Qualitative Study on The Role of Schools as a Social Institution in Nigeria

Garba, Aisha Lawal[1]
Email: aishalawalr@gmail.com
Tel: +2348066032989

AHMAD, Kainuwa[1]
Email: ahmadkainuwa@yahoo.com
Tel: +2348032790239

DAJO, Ugba

[1]Department of Educational Foundations, Faculty of Education, Federal University Gusau
[2]Department of Sociology, Faculty of Management and Social Science, Federal University Gusau

Abstract
Schools, as fundamental social institutions, play a pivotal role in shaping both individuals lives and broader societal structures. This paper, the role of schools as social institutions, explores how educational establishments function beyond mere centers for academic instruction by serving as arenas for socialization, cultural transmission, and the reinforcement or transformation of social norms and values. Drawing on classic sociological theories from Durkheim's insights into the integrative functions of education to Bourdieu's discussions on cultural capital and social reproduction; this paper examines the multifaceted contributions of schools to society. The discussion will highlight the dual role of schools in fostering social cohesion and perpetuating social stratification. On one hand, schools serve as vital environments for social integration, where students learn essential norms, values, and behaviors that enable them to participate effectively in civic life. Through structured curricula, extracurricular activities, and peer interactions, educational institutions inculcate a shared sense of identity and community, thereby contributing to societal stability and continuity. On the other hand, the paper will critically assess how schools can also mirror and reinforce existing social inequalities. Institutional practices, curriculum biases, and differential access to quality education often contribute to the reproduction of class, race, and gender disparities. By examining case studies and empirical research, the paper will discuss the mechanisms through which educational systems may inadvertently limit upward social mobility, despite their potential as sites for transformative change. Furthermore, the paper will explore contemporary challenges and opportunities faced by schools in an increasingly globalized and digital society. Topics such as the impact of technology on social interactions, the evolution of pedagogical practices, and the role of schools in addressing issues like multiculturalism and social justice will be critically analyzed. By integrating theoretical frameworks with practical insights, this paper aims to provide participants with a comprehensive understanding of the complex interplay between education and society. Ultimately, the discussion will illuminate how schools, as enduring social institutions, not only mirror the values and conflicts of their surrounding environments but also possess the potential to act as catalysts for positive social transformation.
Keywords: *Education, School, Social institutions, transformative change, society, social stratification*

Introduction
Schools are fundamental social institutions that contribute to the development of individuals and societies. Beyond providing academic education, they function as spaces for socialization, cultural transmission, and economic mobility. As social institutions, schools help shape social norms, values, and behaviors that influence students throughout their lives. They serve as a bridge between family, economy, government, and broader society, playing a crucial role in maintaining social order and fostering progress. Sociologists view schools through different theoretical perspectives. According to Bourdieu's theory of social and cultural reproduction, schools are instrumental in maintaining existing social hierarchies. Education systems tend to favor dominant cultural capital, meaning that students from privileged backgrounds often gain better educational outcomes, reinforcing social stratification over generations (Bourdieu, 1986). Similarly, research on education and social stratification highlights that schools can both enable upward mobility and reinforce societal divisions, depending on how resources and opportunities are distributed (Breen & Jonsson, 2005). From a functionalist perspective, schools contribute to social stability by teaching shared values, skills, and norms that integrate individuals into society. They help in the socialization process, instilling discipline, civic responsibility, and teamwork. In contemporary society, schools also serve as sites for addressing social issues such as inequality, discrimination, and emotional well-being (Altan, 2020). Conflict theorists, on the other hand,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202561

highlight how education can reinforce social inequalities, where privileged groups gain greater access to quality education, perpetuating class divisions (Bowles & Gintis, 2016). Symbolic interactionists focus on micro-level interactions in classrooms, such as teacher-student relationships and peer influences, which shape identity and learning outcomes (Becker, 2017). Schools do more than teach academic content; they shape students' social identities, encourage civic responsibility, and promote ethical reasoning. They introduce students to structured environments with rules and expectations, preparing them for future societal roles. Research highlights that schools also cultivate essential life skills such as teamwork, leadership, and critical thinking, which are critical for personal and professional success

Theoretical Perspectives on Schools as Social Institutions

Education is a key institution that shapes society by transmitting knowledge, values, and skills. Several sociological theorists, including Emile Durkheim, Pierre Bourdieu, Karl Marx, and Talcott Parsons, have provided distinct perspectives on the role of schools in society. Their theories offer insights into how education contributes to social cohesion, social reproduction, inequality, and role allocation.

Emile Durkheim: Education as a Means of Social Cohesion

Durkheim viewed education as essential for maintaining social order. He argued that schools teach individuals the values, norms, and skills necessary for societal integration. By instilling a collective consciousness, schools help individuals develop a sense of belonging and shared identity. He believed that without a shared moral foundation, societies would face instability and fragmentation. Durkheim's ideas remain relevant today, particularly in discussions about civic education, multicultural curricula, and the role of schools in fostering national unity and democratic participation. A modern example of Durkheim's theory is seen in citizenship education programs, which teach students about rights, responsibilities, and democratic values to encourage active participation in society.

Pierre Bourdieu: Cultural Capital and Social Reproduction

Bourdieu emphasized that schools contribute to social reproduction by transmitting cultural capital. Middle- and upper-class students often possess linguistic, cultural, and social advantages that align with educational expectations, giving them a competitive edge. Schools, rather than reducing inequalities, may reinforce existing social hierarchies. He argued that education is not a neutral institution but rather one that benefits students from privileged backgrounds. For instance, A child from a wealthier family may have access to books, museum visits, and educated parents who guide their learning. This gives them an advantage over a working-class child who may not have these resources, reinforcing educational disparities.

Karl Marx and Conflict Theory: Education as a Mechanism of Control

From a Marxist perspective, he viewed education through the lens of conflict theory, schools serve the interests of the dominant class by reinforcing capitalist ideologies and social hierarchies. Education systems prepare students for their roles in the workforce, with elite schools producing future leaders while working-class schools focus on discipline and obedience. In many societies, students from affluent backgrounds attend prestigious private schools with greater resources, while poorer students attend underfunded public schools. This reproduces economic inequality across generations. Marx's theory remains relevant in critiques of educational privatization, unequal school funding, and the role of education in workforce stratification.

Talcott Parsons: Role Allocation and Meritocracy

Parsons viewed schools as a mechanism for role allocation, where students are assessed and placed in different social and occupational roles based on merit i.e. sorting students into different career paths based on their talents and achievements. He believed that education operates as a meritocratic system**,** where individuals succeed based on effort and ability rather than social background. Standardized testing and grading systems are based on the idea that students advance in education and careers based on performance rather than privilege. However, critics argue that systemic inequalities such as wealth-based access to private tutoring—undermine true meritocracy. While Parsons' theory highlights the stabilizing function of education, critics point out that social background still influences educational success, making true meritocracy difficult to achieve.

Functions of Schools as Social Institutions in Nigeria

1. **Socialization and Cultural Transmission,** Schools in Nigeria like any other societies, play a fundamental role in shaping individuals and societies. As agents of socialization and cultural transmission, they not only impart academic knowledge but also instill societal values, norms, and behaviors that influence students' personal and professional lives. This process ensures that each generation acquires the cultural heritage, skills, and ethics necessary for active participation in society. Socialization refers to the lifelong process through which individuals learn and internalize the norms, values, customs, and behaviors of their society, is a primary function of schools. Schools are one of the primary agents of secondary socialization, shaping individuals beyond the influence of the family. While families provide early socialization, schools

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202561

introduce children to a broader social structure, preparing them for their roles as citizens and workers. Schools in Nigeria play a vital role in socializing children into the values, traditions, and customs of the country. Through formal and informal curricula, they teach societal norms such as respect, discipline, and cooperation. Schools reinforce national identity through the teaching of Civic Education, which emphasizes patriotism, democracy, and human rights (Nwankwo & Adebayo, 2021).

2. Cultural Transmission: Preserving and Transforming Traditions**,** Cultural transmission refers to the way in which values, beliefs, knowledge, and practices are passed from one generation to the next. Schools play a vital role in this process by preserving and transmitting the nation's rich cultural heritage and adapting them to contemporary realities. They teach students about Nigerian history, languages, literature, arts, and customs, fostering a sense of national identity and cultural pride. In a country with over 250 ethnic groups, schools have the potential to promote intercultural understanding and appreciation. However, they also face the challenge of balancing the preservation of local cultures with the need to foster a cohesive national identity. The curriculum must be designed to reflect the nation's diverse cultural landscape while promoting unity and shared values.

3. Human Capital and Economic Development with workforce preparation, Education is a cornerstone of human capital development, which is essential for economic growth and social progress. Schools equip students with the knowledge, skills, and competencies necessary to participate effectively in the modern workforce. In Nigeria, where the economy is transitioning towards a knowledge-based system, the role of schools in developing critical thinking, problem-solving, and technical skills is paramount. Basic literacy and numeracy are foundational, but schools must also focus on developing higher-order skills that enable students to adapt to a rapidly changing world. Vocational and technical education plays a crucial role in providing practical skills for employment and entrepreneurship. The Nigerian government emphasizes technical and vocational education to reduce unemployment and equip students with practical skills for self-reliance (Okoro & Ibrahim, 2020). For instance, the National Policy on Education (2013) introduced vocational training in secondary schools to enhance entrepreneurship and skill acquisition. However, challenges such as inadequate funding, poor infrastructure, and curriculum mismatches between education and industry needs have hindered the full realization of education's economic role (UNESCO, 2022).

4. Social Mobility and Equity, Education is often touted as a powerful tool for social mobility, providing opportunities for individuals from disadvantaged backgrounds to improve their socio-economic status. In Nigeria, however, access to quality education remains unevenly distributed, with rural and marginalized communities facing significant disadvantages. Schools have the potential to act as equalizers, providing a level playing field for students regardless of their family background. However, systemic inequalities, such as inadequate funding, poor infrastructure, and unqualified teachers, hinder this potential. Addressing these inequalities requires targeted interventions and policies that prioritize equitable access to quality education.

5. National Integration and Cohesion,Schools play a crucial role in shaping responsible and engaged citizens. They teach students about their rights and responsibilities, the principles of democracy, and the importance of civic participation. In a diverse and often politically charged environment, schools have the potential to foster a sense of national unity and cohesion. By promoting understanding, tolerance, and respect for diversity, schools can help to bridge ethnic and religious divides. However, they also face the challenge of addressing issues such as ethnic and religious conflicts that can undermine national integration. The establishment of Unity Schools (Federal Government Colleges) was aimed at promoting national integration by admitting students from different states. However, ethnic and religious tensions sometimes influence school environments, particularly in regions affected by insurgency and communal conflicts (Obi & Agbakwuru, 2021).

6. Moral and Ethical Development, Schools instill ethical values, discipline, and civic responsibility in students. The Nigerian education system incorporates Moral Instruction and Religious Studies into the curriculum to guide students toward good behavior and responsible citizenship. The influence of teachers and school administrators also plays a crucial role in shaping students' moral compass (Ajayi & Fasina, 2019). For instance, many Nigerian secondary schools enforce disciplinary measures such as wearing uniforms, adhering to school rules, and engaging in community service to promote moral development. Despite these efforts, issues such as examination malpractice, corruption in school administration, and declining ethical standards remain challenges that need urgent attention.

7. Political Socialization and Civic Engagement, Schools in Nigeria play a role in preparing students for democratic participation. Through subjects like Government and Civic Education, students learn about the constitution, the rights and responsibilities of citizens, and the importance of democratic governance (Onuoha & Egbo, 2022). The National Youth Service Corps (NYSC), a mandatory one-year service for Nigerian graduates, further enhances political socialization by

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202561

promoting national service and unity. However, political interference in education and poor funding of public schools have led to dissatisfaction among students, contributing to political apathy in some cases (Okeke, 2021)

School and Social stratification

Social stratification refers to the hierarchical arrangement of individuals in a society based on factors such as wealth, education, occupation, and social status (Giddens & Sutton, 2021). Schools play a crucial role in either mitigating or reinforcing social stratification by determining access to educational opportunities, influencing career trajectories, and shaping social mobility. While education is often regarded as a tool for reducing inequality, sociologists argue that schools sometimes perpetuate existing class structures through mechanisms such as differential access to resources, curriculum biases, and credentialing systems (Bourdieu, 2018). In Nigeria and many other countries, educational institutions are deeply linked to social class, ethnicity, and economic background. Factors such as public vs. private schooling, rural vs. urban education, and disparities in funding and teacher quality create inequalities that affect students' future opportunities (Obi & Agbakwuru, 2021). This section explores how schools contribute to social stratification through economic, cultural, and institutional mechanisms**.**

The Role of Schools in Social Stratification

1. **Unequal Access to Quality Education:** One of the primary ways schools contribute to social stratification is through disparities in access to quality education. Wealthier families can afford to send their children to private schools, which often have better infrastructure, highly qualified teachers, and access to extracurricular opportunities. In contrast, public schools—especially those in rural or underserved areas—struggle with overcrowding, poor facilities, and underfunded programs (UNESCO, 2022).
2. **Cultural Capital and Social Reproduction (Bourdieu's Perspective):** Pierre Bourdieu (2018) introduced the concept of cultural capital, which refers to the knowledge, skills, and cultural norms that individuals inherit from their families. Schools often favor students who possess cultural capital aligned with middle- and upper-class values, giving them an advantage in academic performance and social integration.
3. **Tracking and Streaming Systems:** Many education systems, including those in Nigeria, use tracking or streaming to place students into different academic levels based on perceived ability. While tracking aims to tailor education to students' strengths, it often leads to class-based segregation where wealthier students are placed in higher academic tracks, while poorer students receive lower-quality instruction (Okoro & Ibrahim, 2020).
4. **Credentialism and the Labor Market:** Credentialism refers to the increasing reliance on educational qualifications for employment. In stratified societies, individuals with prestigious degrees from elite institutions have better job prospects, while those with lower credentials face limited career opportunities (Collins, 2019).
5. **Gender and Social Stratification in Education:** Schools also contribute to social stratification through gender disparities in education. In many parts of the world, including Nigeria, girls face more barriers to schooling due to cultural expectations, early marriage, and financial constraints (UNESCO, 2022).

Contemporary Issues in School Socialization and Cultural Transmission

Contemporary societies face significant challenges in school socialization and cultural transmission due to globalization, technological advancements, socio-political changes, and demographic shifts (Banks, 2022).

1. Multiculturalism and Diversity in Education; Increasing Cultural Diversity in Schools With globalization and migration, schools are becoming more ethnically, linguistically, and culturally diverse. While this presents opportunities for cross-cultural learning, it also poses challenges in fostering inclusive curricula, addressing discrimination, and promoting intercultural competence (Banks, 2022). For instance, in countries like the United States, Canada, and Nigeria, schools cater to multilingual students, requiring curricula that integrate diverse cultural perspectives (Adeyemi & Adekunle, 2021).
2. Digitalization and Virtual Socialization; Technology's Impact on School Socialization, With the rise of digital education, social media, and virtual classrooms, students are increasingly socialized through online interactions rather than traditional face-to-face learning. The COVID-19 pandemic accelerated online learning, reducing in-person peer interactions and altering traditional school socialization patterns (UNESCO, 2021).
3. The Changing Role of Families in Socialization, Evolving Family Structures and Their Impact on Students Traditional nuclear families are evolving, with increasing numbers of single-parent households, blended families, and same-sex parent families (Cherlin, 2020). These shifts influence children's socialization experiences and expectations.
4. Political and Ideological Conflicts in Schools, Schools as Battlegrounds for Political and Ideological Debates, Education systems often reflect political and ideological influences, leading to debates over curriculum content, religious education, and civic values (Apple, 2018).

The Role of Teachers in Shaping Social Norms

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202561

Teachers play a crucial role in shaping social norms by influencing students' values, behaviors, and attitudes toward society. Beyond delivering academic content, teachers act as agents of socialization, instilling ethical principles, cultural values, and societal expectations (Giddens & Sutton, 2021). Schools function as miniature societies where teachers help students navigate social relationships, develop a sense of civic responsibility, and prepare for adulthood (Banks, 2022). In today's rapidly changing global landscape, teachers must adapt to contemporary challenges such as diversity, digital socialization, gender roles, and moral dilemmas (UNESCO, 2022). This section examines the various ways teachers influence social norms**,** exploring their impact on moral development, cultural values, social behavior, and inclusive education**.**

1. Teachers as Role Models in Social Norms Formation; Teachers' Influence on Students' Moral and Ethical Development Teachers demonstrate and reinforce social norms through their words, actions, and expectations. By modeling respect, integrity, and empathy, teachers instill these values in students, shaping moral behavior and decision-making (Durkheim, 2018).
2. Teachers as Enforcers of Discipline and Behavioral Expectations; Establishing Classroom Rules and Social Order, Teachers reinforce behavioral norms through classroom management strategies, encouraging students to develop self-discipline and respect for authority (Parsons, 2019). Schools often impose rules on punctuality, dress codes, and respectful communication**,** which reflect broader societal expectations (Apple, 2018).
3. Teachers and the Transmission of Cultural Values; Reinforcing National Identity and Cultural Awareness, Teachers play a significant role in cultural transmission, helping students understand and appreciate their national heritage, traditions, and societal roles (Banks, 2022). In Nigeria, teachers incorporate local languages, historical narratives, and traditional customs into lessons to foster national pride (Adeyemi & Adekunle, 2021).
4. Teachers and Social Inclusion in Schools: Promoting Diversity, Equity, and Inclusion, Teachers foster inclusive social norms by advocating for equal opportunities, gender equality, and respect for diverse identities (UNESCO, 2022). Teachers who use gender-neutral language, encourage participation from all students, and challenge discriminatory behaviors help create a more equitable learning environment (Obi, 2020).
5. Teachers as Agents of Change in Contemporary Society: Adapting to Social Transformations and Emerging Trends, Teachers shape social norms by responding to technological advancements, political changes, and economic shifts. With the rise of digital communication, teachers must educate students on responsible online behavior, digital ethics, and media literacy (OECD, 2022).

Conclusion

Schools, as social institutions, play a vital role in shaping individuals and society. While they facilitate social integration and mobility, they also contribute to social stratification. Theoretical perspectives from Durkheim, Bourdieu, Marx, and Parsons help us understand how schools' function in maintaining societal structures. Contemporary challenges such as globalization, technology, and inclusivity require educational reforms that promote equity and accessibility. By recognizing both the strengths and limitations of educational institutions, policymakers, educators, and communities can work towards a more just and inclusive society.

Recommendations

To enhance the role of schools as social institutions and mitigate inequalities, the following recommendations should be considered:

1. **Promote Equal Access to Education:** Governments should invest in underfunded schools and provide scholarships to bridge economic disparities.
2. **Revise Curriculum for Inclusivity:** Educational content should reflect diverse perspectives, histories, and cultural backgrounds.
3. **Train Teachers for Socio-Cultural Sensitivity:** Professional development programs should equip educators with skills to address social inequalities in classrooms.
4. **Reduce the Impact of the Hidden Curriculum:** Schools should critically assess implicit messages transmitted through disciplinary policies, teaching styles, and school culture.
5. **Enhance Digital Literacy and Access:** Governments and institutions should provide affordable internet access and technology to students in low-income areas.

References

Adeyemi, T., & Adekunle, O. (2021). Multicultural Education in African Schools. *Journal of Comparative Education*, 34(1), 78-93.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
zijefugusau@gmail.com
DOI: https://doi.org/10.64348/zije.202561

Ajayi, K., & Fasina, O. (2019). The Role of Education in Moral Development in Nigeria. *Journal of Social Policy and Education*, 22(1), 34-50.
Altan, M. (2020). "Education Reform Journal, 2020, 5(1), 1-7." Retrieved from [ERIC database] 【38】.
Apple, M. W. (2018). *Can Education Change Society?* Routledge.
Banks, J. (2022). *Cultural Diversity and Education: Foundations, Curriculum, and Teaching*. Pearson.
Becker, H. S. (2017). *Labeling in the Classroom: The Impact of Teacher Expectations. Educational Research Review*, 12(3), 289–302.
Bourdieu, P. (1986). *The Forms of Capital.* In J. G. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education* (pp. 241-258). Greenwood.
Bourdieu, P. (2018). *Distinction: A Social Critique of the Judgment of Taste*. Harvard University Press.
Bowles, S., & Gintis, H. (2016). *Schooling in Capitalist America: Educational Reform and the Contradictions of Economic Life.* New York: Basic Books.
Breen, R., & Jonsson, J. (2005). "Education and Social Stratification Processes in Comparative Perspective." Retrieved from JSTOR 【39】.
Cherlin, A. (2020). *Public and Private Families: An Introduction*. McGraw-Hill.
Collins, R. (2019). The Role of Credentialism in Social Stratification. *Annual Review of Sociology*, 45, 89-110.
Durkheim, E. (2018). *Education and Sociology*. The Free Press.
Federal Ministry of Education. (2019). *National Education Policy Report*. Abuja: Government Press
Giddens, A., & Sutton, P. (2021). *Sociology: A Global Introduction*. Polity Press.
Nwankwo, P., & Adebayo, T. (2021). Civic Education and National Identity in Nigerian Schools. *Journal of Political Studies*, 14(4), 78-92.
Obi, C. (2020). Gender and Inclusive Education in Africa. *African Educational Research Journal*, 18(3), 112-130.
Obi, E., & Agbakwuru, C. (2021). Education and Social Stratification in Nigeria. *Nigerian Journal of Social Sciences*, 8(1), 33-48.
OECD. (2022). *The Digital Divide in Education: Bridging Gaps for the Future*. OECD Publishing.
Okeke, C. (2021). Gender and Educational Attainment in Sub-Saharan Africa. *Education Research Review*, 20(4), 101-120.
Okoro, P., & Ibrahim, A. (2020). Tracking and Educational Inequality in Nigeria. *African Economic Review*, 22(4), 120-135.
Onuoha, D., & Egbo, O. (2022). The Role of Education in Social Mobility. *Civic Education Journal*, 15(1), 78-92.
Parsons, T. (2019). The School as a Social System. *Harvard Educational Review*, 39(2), 289-305.
UNESCO. (2022). *Education in Africa: Challenges and Opportunities*. Paris: UNESCO Publishing.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202562

Impact of Problem-Focused Coping Strategy Using Active Coping Strategy among Victims of Fire Disaster in Maiduguri Monday Market, Borno State

MOHAMMED, Babagana[1]
Email: bbgana7020@gmail.com
Tel. 08087582109

ABDULLAHI, Baba Zai[2]
Email: Abdullahibz444@gmail.com
Tel. 08133351523

[1] Department of Physical and Health Education, University of Maiduguri.
[2] Department of General Studies, Mohamet Lawan College of Agriculture Maiduguri.

Abstract
The purpose of this study was to determine impact of problem-focused coping strategy using active coping strategy among victims of fire disaster in Maiduguri Monday Market Borno State. Active coping is a coping strategy which involves activities like planning, confronting, constructing solution, consultation and working approach to prevent stress arising from psychological state. The objective of the study was to determine the impact of problem-focused strategy using active coping strategy among victims of fire disaster in Maiduguri Monday Market. The study was delimited to six (6) categories of traders. A cross sectional research design was used for the study. The population for this study were comprises 20,000 victims of Maiduguri Monday Market fire disaster. Purposive sampling technique was used to select six (6) trading units from (14) existing different trading units of Maiduguri Monday Market for the study. Stratified sampling technique with proportionate method was used to select (5%) from each of the six (6) categories of traders making a stratum. A sample of 516 traders was selected using convenience sampling method. Data were collected using self-developed five 5-item questionnaire. Split haft method reliability test was used to determine internal consistency of the instrument while data collected from pilot test were subjected to Spearman-Brown Formula which yielded reliability coefficient 0.846. Descriptive statistics of frequency counts and percentages were used to answer the research questions, while inferential statistics of chi-square (χ^2) was used to test the hypotheses at 0.05 level of significance. The null hypothesis was rejected ($p<0.05$). This shows that, there was significant difference in responses on problem-focused coping strategy using active coping strategy among Maiduguri Monday Market fire disaster traders in textiles, cosmetics, food stuff, domestic cooking oil, plastic materials and domestic cooking utensils. The result of the study also indicated that, victims of Maiduguri Monday Market fire disaster employed active coping strategies and they actively engage in some efforts to re-establish their businesses after the fire disaster. The study recommended among others that, traders of Maiduguri Monday Market fire disaster should be encourage to continue employing active coping strategies and are to actively engage in some efforts in order to re-establish their businesses after the fire disaster.
Keyword: Active Coping, Monday Market, Victims, Fire Disaster

Introduction
Maiduguri Monday Market is the largest market in Borno State and been the largest market in the North-Eastern part of Nigeria, and it continues to be the center of Borno State economy (www.tribuneonlineng.com, 2023). Maiduguri Monday Market fire disaster has led the market to a considerable amount of loss of billions of Naira, with approximately 20,000 traders of different categories affected by the disaster and about 12,000 shops, stores and kiosks razed down (Maiduguri Monday Market Company Limited, 2023). Knopp, (2016) states that, market fire disaster disrupted economic activities, which resulted in the development of psychological and psychosocial impacts in the form of anxiety, fear, depression, grief for losing means of livelihood. Market fire disasters can result in prolonged periods of stress, which led to sadness, anxiety, depression, fear and grief for victims who have exposed to the trauma (Benight & Bandura, 2014). The victims of Maiduguri Monday Market fire disaster are physically, psychologically and emotionally distressed due to the loss of valuable properties like financial records books, inventories and fixed asset. These losses led to psychological stresses such as anxiety, depression, fear, trauma, grief which seriously triggered the adoption of different types of coping strategies to cope with the stressors. Victims of disasters usually employed various coping strategies to directly address the stressful situation or change negative emotional response to a problem. They resorted to using problem-focused or

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202562

emotion-focused coping strategies to cope with the stressors. Coping is specifically used to describe the conscious and voluntary mobilisation of actions employed by victims of natural disaster to modify adverse aspects of their environment as well as minimise internal threats brought on by the disaster (Carver & Connor-Smith, 2010). Coping can be expressed in diverse ways, but usually problem-focused and emotion-focused coping strategies are more commonly used by stress victims of natural disaster to cope with the stressors. Active coping is a coping strategy which involves activities like planning, confronting, constructing solution, consultation and working approach to prevent stress arising from psychological state (Satow, 2019). Active coping strategy also known as problem-focused coping strategy which involve cognitive and behavioural strategies that are intended to make a direct response to the stressor, either by changing the stressful situation (primary control) or the negative emotions related to it (secondary control) (Freire, Ferradás & Regueiro, 2020).

This coping strategy it includes approaches such as planning, acting, looking for help (instrumental and emotional), seeing the positive side of the situation, or accepting it (Freire, Ferradás & Regueiro, 2020). Action coping strategy involve taking action to address the problem or situation causing stress. Aldwin, and Yancura (2014) states that, this coping strategy requires individuals to be actively engaged in fulfilling their own goals. Active coping strategy encourages problem-solving and can also provide a sense of accomplishment, as individuals can see the progress they have made in their own skills and abilities. Successively, cognitive flexibility is enhanced, improving quality of life to overcome the stressful situation for the benefits of overall health outcome (Theodoratou, Gkintoni & Farmakopoulou, 2023). As the negative psychological challenges brought on by fire disaster it has been evident that, there is a need for the victims of Maiduguri Monday Market to address ways of increasing active coping mechanisms that can improve mental health, and possibly be used as a prevention measure for other severe mental health state. Active coping strategy engaged stress victims of natural disaster to act proactively in problem-solving and can also bring about a feeling of accomplishment, as the victims observed the progress they have made on their own talents and capacities to overcome the stressor (Carroll, 2013). Stressful individuals may develop resilience through the development and improvisation of their skills and abilities toward their stressors (Carroll, 2013). Active coping is generally associated with intrinsic motivation, as it requires individuals to be actively involved on their own objectives. Furthermore, individuals may develop a mind-sets based on the certainty that one's talents and abilities can be strengthened (Theodoratou, et, al., 2023).

Action coping strategy include taking action to reduce stress, such as involving in physical activity and taking part in activities, problem solving or seeking help from others it also involves information strategies include gathering information, ideas, thoughts to better understand the stressful situation, such as talking to others or exploring the issue (Theodoratou, et, al., 2023). Cheung and Yip (2015) found that, physical activities, lifestyle and leisure time activities can be used as active coping strategy which have positive effect on reducing depression, anxiety, fear with physical activity being a key factor in mental health. The finding of Cheung and Yip (2015) further suggests that, using active coping strategies and relaxation techniques such as lifestyle and leisure time activities can influence positive impact on various mental health problems like anxiety or depression. Active coping strategy in a stressful situation can also be protective coping strategy which include, looking for positive oriented, debriefing, positive thinking, optimism, acceptance, purpose in life, humour, planning, positive reframing, and social support (Rodrıguez-Rey 2019). Therefore, it is against this background that, this study sought to determine the impact of problem-focused coping strategy using active coping strategy among victims of fire disaster in maiduguri monday market, Borno State.

Maiduguri Monday Market was affected by a fire disaster on 26 February, 2023; that has led to a considerable amount of loss of billions of Naira, during which different categories of traders loss their livelihood. These losses led the victims of Maiduguri Monday Market fire disaster to experience severe mental and emotional health problems such as feelings of anxiety, depression, anger, fear, sadness, grief, confusion, sleeping difficulties, flashbacks, among others, which trigger the victims to employ problem-focused coping strategies to cope with the stresses of their losses. A significant percentage of victims of Maiduguri Monday Market fire disaster have difficulties in decision-making, self-concentration, locating financial support to re-establish their business and finding a new location to settle down. These challenges worsened the victims emotional burdens and mental health conditions, resulting into stresses with consequences of making choice of right patterns of coping strategies to cope with the stressors. It is against this background that, this study is designed to determine impact of problem-focused coping strategy using active coping strategy among victims of fire disaster in maiduguri monday market, Borno State.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202562

Objectives of the study:

The objective of this study was to determine

1. the impact of Problem-focused strategy using active coping strategies among victims of fire Disaster in Maiduguri Monday market.

Research Questions:

1. What is the percentage responses on impact of problem-focused coping strategy using active coping strategies among victims of fire disaster in Maiduguri Monday market?

Hypotheses:

1. There is no significant difference in mean responses on impact of problem-focused coping strategy using active coping strategies among victims of fire disaster in Maiduguri Monday market

Methodology:

A cross sectional research design of survey method was used for the study. The population for this study were comprises 20,000 victims of Maiduguri Monday Market fire disaster. Purposive sampling technique was used to select six (6) trading units from (14) existing different trading units of Maiduguri Monday Market for the study. Stratified sampling technique with proportionate method was used to select (5%) from each of the six (6) categories of traders making a stratum. A sample of 516 traders were selected using convenience sampling method. Data were collected using self-developed five 5-item questionnaire on impact of problem-focused coping strategy using active coping strategy among victims of fire disaster in Maiduguri monday market, Borno State. The questionnaire was validated tested using split haft method while data collected from pilot test were subjected to Spearman-Brown Formula which yielded 0.84 reliability coefficient. Using a four-point modified Likert type scale with response modes of "Strongly Agree (SA) 4 points, Agree (A) 3 points, Disagree (D) 2 points, and Strongly Disagree (SD) 1 points". To ensure the reliability of the instrument, the researcher used test retest method to obtained 0.84 reliability index of the instrument for pilot testing. Descriptive statistics of frequency counts and percentages were used to describe the demographic characteristics of the respondents and to answer the research questions, while inferential statistics of chi-square (χ^2) was used to test the hypotheses at 0.05 level of significance.

Presentation of Results

Descriptive statistics of frequency counts and percentages were used to describe the demographic characteristics of the respondents and to answer the research questions, while inferential statistics of chi-square (χ^2) was used to test the hypotheses at 0.05 level of significance.

Research Question 1

What is the percentage responses on impact of problem-focused coping strategy using active coping strategies among victims of fire disaster in Maiduguri Monday market?

Table 1: Shows Responses of Victims of Maiduguri Monday Market Fire Disaster on The Impact of Problem-Focused Coping Strategy Using Active Coping Strategies ***n*** **= 516**

S/N	Variables	Response Options	Respondents	Percentage (%)
1.	I double my efforts to make my worried situation to be better.	SA	192	37.2
		A	148	28.7
		D	104	20.2
		SD	72	14.0
2.	I stand up to come with some strategies on how to re-establish my business.	SA	199	38.6
		A	106	20.5
		D	109	21.1
		SD	102	19.8

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202562

3.	I always try to make some plans about the continuity of my business.	SA	205	39.7
		A	137	26.6
		D	96	18.6
		SD	78	15.1
4.	I try to act promptly on how to overcome the stressful situation.	SA	196	38.0
		A	128	24.8
		D	115	22.3
		SD	77	14.9
5.	I stand up to confront the stressful situation to make it better.	SA	173	33.5
		A	170	32.9
		D	95	18.4
		SD	78	15.1

Keys: SA= Strongly Agree, A= Agree, D= Disagree, SD= Strongly Disagree.
Sources: Field Work 2024

The result in table 1 above shows the responses of victims of Maiduguri Monday Market fire disaster the impact of problem-focused coping strategy using active coping strategies. The result in item 1 showed that, 192(37.2%) strongly agreed that, they tried to double their efforts to made their worried situation to be better, 148(28.7%) agreed, 104(20.5%) disagreed while only 72(14.0%) strongly disagreed with the statement. This means that, majority of the respondents 192(37.2%) strongly agreed that, they tried to double their efforts to made their worried situation to be better. Item 2 showed that, 199(38.6%) strongly agreed that, they stood up to come with some strategies on how to re-establish their businesses, 106(20.5%) agreed, 109(21.1%) disagreed while 102(19.8%) strongly disagreed with the statement. This means that, majority of the respondents 199(38.6%) strongly agreed that, they stood up to come with some strategies on how to re-establish their businesses. Similarly, item 3 in the table also showed that, 205(39.7%) strongly agreed that, they always tried to make some plans about the continuity of their businesses, 137(26.6%) agreed, 96(18.6%) disagreed while 78(15.1%) strongly disagreed with the statement. This means that, majority of the respondents 205(39.7%) strongly agreed that, they always tried to make some plans about the continuity of their businesses. Item 4 showed that, 196(38.0%) strongly agreed that, they tried to act promptly on how to overcome the stressful situation induced by the fire disaster, 128(24.8%) agreed, 115(22.3%) disagreed while 77(14.9%) strongly disagreed with the statement. This means that, majority of the respondents 196(38.0%) strongly agreed that, they tried to act promptly on how to overcome the stressful situation induced by the fire disaster. Item 5 also showed that, 173(33.5%) strongly agreed that, they stood up to confront their stressful situation to make it better, 170(32.9%) agreed, 95(18.4%) disagreed while 78(15.1%) strongly disagreed with the statement. This means that, majority of the respondents 173(33.5%) strongly agreed that, they stood up to confront their stressful situation to make it better.

Hypothesis 1

There is no significant difference in mean responses on impact of problem-focused coping strategy using active coping among victims of fire disaster in Maiduguri Monday market

Table 2: Summary of Chi-square Analysis on Responses of Traders in Textiles, Cosmetics, Food Stuff, Domestic Cooking Oil, Plastic Materials and Domestic Cooking Utensils of Maiduguri Monday Market Fire Disaster on the Impact of Problem-focused Coping Strategy using Active Coping Strategies

S/N	Items	Rep.	SA	A	D	SD	Total	χ^2	df	P-value	Decision
1.	I double my efforts to mak my worried situation to b better.	TT	28 (34.6)	27 (26.7)	24 (18.7)	14 (13.0)	93				
		CT	33 (28.7)	16 (22.1)	15 (15.5)	13 (10.7)	77				
		FST	43	27	18	11	99	13.913	15	.024	Ho rejected

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202562

			(36.8)	(28.4)	(20.0)	(13.8)				
		DCOT	29	25	15	11	80			
			(29.8)	(22.9)	(16.1)	(11.2)				
		PMT	28	30	10	12	80			
			(29.8)	(22.9)	(16.1)	(11.2)				
		DCUT	31	23	22	11	87			
			(32.4)	(25.0)	(17.5)	(12.1)				
		Total	**192**	**148**	**104**	**72**	**516**			
2.	I stand up to come witl	TT	34	25	19	15	93			
	some strategies on how t		(35.9)	(19.1)	(19.6)	(18.4)				
	re-establish my business.									
		CT	32	14	16	15	77			
			(29.7)	(15.8)	(16.3)	(15.2)				
		FST	43	13	23	20	99	29.137	15	.015	Ho rejected
			(38.2)	(20.3)	(20.9)	(19.6)				
		DCOT	20	14	26	20	80			
			(30.9)	(16.4)	(16.9)	(15.8)				
		PMT	34	25	6	15	80			
			(30.9)	(16.4)	(16.9)	(15.8)				
		DCUT	36	15	19	17	87			
			(33.6)	(17.9)	(18.4)	(17.2)				
		Total	**199**	**106**	**109**	**102**	**516**			
3.	I always try to make som	TT	34	28	18	13	93			
	plans about the continuity o		(36.9)	(24.7)	(17.3)	(14.1)				
	my business.									
		CT	19	22	21	15	77	29.734	15	.013	Ho rejected
			(30.6)	(20.4)	(14.3)	(11.6)				
		FST	49	23	20	7	99			
			(39.3)	(26.3)	(18.4)	(15.0)				
		DCOT	29	20	10	21	80			
			(31.8)	(21.2)	(14.9)	(12.1)				
		PMT	39	22	9	10	80			
			(31.8)	(21.2)	(14.9)	(12.1)				
		DCUT	35	22	18	12	87			
			(34.6)	(23.1)	(16.2)	(13.2)				
		Total	**205**	**137**	**96**	**78**	**516**			
4.	I try to act promptly o	TT	45	26	15	7	93			
	how to overcome th		(35.3)	(23.1)	(20.7)	(13.9)				
	stressful situation.									
		CT	21	19	17	20	77			
			(29.2)	(19.1)	(17.2)	(11.5)				
		FST	35	17	31	16	99	35.555	15	.002	Ho rejected
			(37.6)	(24.6)	(22.1)	(14.8)				
		DCOT	33	18	21	8(11.9)	80			
			(30.4)	(19.8)	(17.8)					
		PMT	33	26	15	6	80			
			(30.4)	(19.8)	(17.8)	(11.9)				
		DCUT	29	22	16	20	87			
			(33.0)	(21.6)	(19.4)	(13.0)				
		Total	**196**	**128**	**115**	**77**	**516**			

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202562

5.	I stand up to confront th stressful situation t make it better.	TT	26 (31.2)	26 (30.6)	20 (17.1)	21 (14.1)	93			
		CT	33 (25.8)	24 (25.4)	12 (14.2)	8 (11.6)	77			
		FST	33 (33.2)	35 (32.6)	14 (18.2)	17 (15.0)	99	27.245	15	.027 Ho rejected
		DCOT	25 (26.8)	27 (26.4)	20 (14.7)	8 (12.1)	80			
		PMT	26 (26.8)	29 (26.4)	7 (14.7)	18 (12.1)	80			
		DCUT	30 (29.2)	29 (28.7)	22 (16.0)	6 (13.2)	87			
		Total	**173**	**170**	**95**	**78**	**516**			

Keys: Figures in brackets are the expected frequencies. Rep= Respondents, TT= Textile Traders, CT= Cosmetics Traders, FST= Food Stuff Traders, DCOT= Domestic Cooking Oil Traders, PMT= Plastic Materials Traders and DCUT= Domestic Cooking Utensils Traders.

Sources: Field Work 2024

The result in table 2 showed summary of chi-square analysis on responses of traders in textile, cosmetics, food stuff, domestic cooking oil, plastic materials and domestic cooking utensils of Maiduguri Monday Market fire disaster on the impact of problem-focused coping strategy using active coping strategies. The result showed that, for items 1, 2, 3, 4 and 5 the null hypothesis was rejected in each case ($p<0.05$). This therefore shows that, there was significant difference in responses on the impact of problem-focused coping strategy using active coping strategies among traders in textiles, cosmetics, food stuff, domestic cooking oil, plastic materials and domestic cooking utensils of Maiduguri Monday Market fire disaster in each of the item.

Discussion of Findings

The result of this present study also shows that, majority of the traders of Maiduguri Monday Market fire disaster employed active coping strategies and they actively engage in some efforts to re-establish they businesses after the fire disaster. This finding is in agreement with Cheung and Yip (2015) found that, used of active coping strategy has positive effect on reducing depression, anxiety and fear among victims of natural disaster and improved mental health outcome. Similarly, Carroll (2013) found that, used of active coping strategy engaged stress victims of natural disaster to act proactively in problem-solving and can also bring about a feeling of accomplishment, as the victims observed the progress they had made on their own talents and capacities to overcome the stressor. Furthermore, Theodoratou, et, al., (2023) found that, victims of natural disaster who sought active coping strategy encourages problem-solving skills and can also provide a sense of accomplishment, as individuals can see the progress they have made in their own skills, talents and abilities. Used of active coping strategy improved cognitive flexibility, enhanced mental toughness, improved quality of life to overcome the stressful situation for the benefits of overall health outcome (Theodoratou, Gkintoni & Farmakopoulou, 2023). Appiah-Boateng, and Bukari (2022) also found that, victims of disaster who sought action coping strategy are more likely to reduce stress brought by the disaster.

Conclusion

This study sought to determine impact of problem-focused coping strategy using active coping strategy among victims of fire disaster in Maiduguri monday market, Borno State. Maiduguri Monday Market fire disaster traders resorted to problem-focused coping strategy using active coping strategies in order to make some efforts to re-establish their businesses after the fire disaster and alleviate the stresses of their losses.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Traders of Maiduguri Monday Market fire disaster should be encouraged to continue employing active coping strategies and are to actively engage in some efforts to re-establish their businesses after the fire disaster and alleviate the stresses of their losses.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202562

2. Borno State Government in collaboration with non-governmental organization and philanthropists that are into humanitarian programs should support victims of Maiduguri Monday Market fire disaster with materials support in order to re-establish their businesses.
3. Commercial Banks should provide an interest free loan to the victims of Maiduguri Monday Market fire disaster to support the re-establishment of their businesses.

Acknowledgements

Special appreciation goes to General Manager of Maiduguri Monday Market Company Limited, Barrister Mustapha Luskorima, leaders of trading units and traders of Maiduguri Monday Market for their time to response to the research questionnaire.

References

Aldwin, C.M., & Yancura, L.A. (2014). Coping Strategies for Victims of earthquake in Philipine. *Journal of Applied Psychology. 2014. p. 507*–510.

Appiah-Boateng, S., & Bukari, K. N. (2022). Coping Strategies for Victims of Flood Disaster in Ghana. *Peace and Conflict: Journal of Peace Psychology*. Advance online publication. https://dx.doi.org/10.1037/pac0000655

Benight, C. C., & Bandura, A. (2014). Social cognitive theory of posttraumatic recovery: The role of perceived self-efficacy. *Journal of Behaviour Research and Therapy, 42(10),*1129–1148.

Carroll, L. (2013). Problem-focused coping. *Journal of Behavioural Medicine*. 2013;1540–1.

Carver, C. S., & Connor-Smith, J. (2010). "Personality and Coping" Annual Review of Psychology. 61:679-704. doi:10.1146/annurev.psych.093008.100352.PMID 19572784. S2CID 6351970

Cheng, C., & Cheung, M.W.L. (2015). Cognitive processes underlying coping flexibility: Differentiation and integration. *Journal of Personality, 73, 859–886*.

Freire, C., Ferradás, K., Mdel, H.L., & Regueiro, B. (2020). Coping strategies and self-efficacy in university students: A person-centered approach. *Frontiers journal of Psychology*. 2020;11.

Knopp, K. A. (2016). Exploring the relationship of emotional intelligence with mental health status in polish unemployed persons-differences between men and women, *Polish Psychological Bulletin*, *47(4),* pp. 436–444. doi: 10.1515/ppb-2016-0051.

Maiduguri Monday Market Company Limited, 2023

Rodrıguez-Rey, R., (2019). Burnout and posttraumatic stress in paediatric critical care personnel: Prediction from resilience and coping styles. Australian Critical Care, 32(1), 46–53. https://doi.org/10.1016/j.aucc.2018.02.003

Satow L. (2019). Stress-und Coping-Inventar (SCI): Test-und Skalendokumentation. https://www.drsatow.de/. Accessed 04 Oct 2019.

Theodoratou, M., Gkintoni, E., & Farmakopoulou, I. (2023) Executive Functions and Quality of Life in Neurodevelopmental Spectrum. An Outline. *Technium Social Sciences Journal*. *2023;39(1)*:430–439.

www.tribuneonlineng.com,2023

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202563

Assessment of Comparative Education Practices among Federal University Administrators for Sustainable Development in Nigeria

AGBONGIASEDE, Catherine Kaning[1]
kateagbongiasede@gmail.com
+2348033580434

EVANS, Ogubio Chukwudi[2]
evansogubio22@gmail.com
+2349035280099

[1]Department of Educational Foundations, Faculty of Educational Foundation Studies University of Calabar, Calabar, Cross River State, Nigeria
[2]Kenule Benson Saro-Wiwa Polytechnic Bori, River State, Nigeria

Abstract
This study explores the role of comparative education as a framework for promoting sustainable development in Nigeria. A descriptive survey design was adopted for this study and data were collected from a purposive sample of 75 (15 percent) respondents out of 1,488 educational administrators across the Federal Universities in Nigeria. A 24-item validated instrument titled: Comparative Education Practices for Sustainable Development Survey (CEP-SDS) was developed and validated with the assistance of two research experts. The instrument's reliability was assessed using Cronbach Alpha, yielding a statistical index of .91, indicating strong reliability for data collection. The questionnaire was structured into three sections aligned with the objectives, focusing on the perceptions of comparative education, its challenges, and potential strategies for sustainable development. All copies of the instrument were administered in person and retrieved immediately to ensure a 100% response rate. The findings reveal that comparative education provides valuable perspectives on best practices, policy formulation, and educational reforms that align with sustainable development goals. Moreover, the study highlights the importance of contextualizing educational strategies to meet the unique needs of Nigeria's diverse population. It concludes that incorporating comparative education can significantly enhance the effectiveness of educational initiatives aimed at fostering sustainable development in the country. Recommendations include promoting international collaborations, integrating comparative studies into teacher training programs, and adapting successful models from other countries to local contexts in order to drive meaningful change in Nigeria's educational landscape.

Keywords: Comparative Education, Sustainable Development, Educational Reform, Capacity Building, Technology Integration

Introduction
The concept of comparative education plays a crucial role in shaping educational policies and practices globally, particularly in the context of sustainable development. In Nigeria, the need for an effective educational system that addresses socio-economic challenges has become increasingly urgent. As the nation strives to achieve the United Nations Sustainable Development Goals (SDGs), integrating comparative education into its framework offers valuable insights from other countries that have successfully navigated similar challenges. By examining and adapting best practices in education, Nigeria can enhance its capacity to foster sustainable growth and development. This study aims to explore the potential of comparative education as a paradigm for sustainable development in Nigeria. It seeks to analyze existing educational models and strategies from various countries, assessing their relevance and applicability to the Nigerian context. Through a comprehensive examination of the interplay between education and sustainable development, this research will provide actionable recommendations for policymakers and educational administrators. Ultimately, the goal is to contribute to a more robust and adaptive educational system that not only meets the immediate needs of Nigerian learners but also prepares them for future challenges in an increasingly interconnected world.

Education is widely recognized as a fundamental driver of sustainable development, providing individuals with the knowledge, skills, and values necessary to address social, economic, and environmental challenges. In Nigeria, however, the educational system faces persistent issues such as outdated curricula, inadequate infrastructure, inequitable access, and a lack

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202563

of alignment with global standards. Comparative education, which involves analyzing and adapting best practices from other countries, presents a valuable paradigm for addressing these challenges and fostering sustainable development. Unfortunately, there has been limited application of comparative education principles in Nigeria, leaving the country's education sector lagging behind in terms of innovation, inclusivity, and global competitiveness. This failure to adopt proven educational frameworks from other contexts has contributed to the slow progress in achieving the Sustainable Development Goals (SDGs), particularly those related to quality education. Despite the potential of comparative education to transform Nigeria's educational system and contribute to sustainable development, there is a notable gap in research and policy implementation in this area. Existing studies have largely focused on comparative education as an academic field rather than as a practical tool for addressing systemic educational challenges. Additionally, there is insufficient exploration of how specific educational models from other countries can be adapted to Nigeria's unique socio-economic and cultural context. This study seeks to fill this gap by examining comparative education as a paradigm for sustainable development in Nigeria, identifying actionable strategies for improving the education system and aligning it with global best practices to drive national growth and development.

Literature Review

Comparative education plays a significant role in fostering sustainable development in Nigeria by providing insights into effective educational practices from different contexts. According to Okech and Rolleston (2022), comparative education allows policymakers and educators to analyze and adapt successful educational models from other countries to address Nigeria's unique challenges. This approach not only enhances the quality of education but also aligns educational outcomes with the Sustainable Development Goals (SDGs), particularly in areas such as quality education, gender equality, and economic growth. By learning from the experiences of other nations, Nigeria can implement strategies that promote inclusivity and accessibility in education, which are essential for sustainable development. Furthermore, the integration of comparative education into Nigeria's educational framework can facilitate the development of human capital necessary for economic advancement. As highlighted by Sele and Wanjiku (2022), education is a critical driver of economic growth, and comparative studies can help identify best practices in curriculum development, teacher training, and resource allocation. By adopting effective educational policies from countries that have successfully navigated similar developmental challenges, Nigeria can enhance its educational system's responsiveness to labor market needs, thereby fostering a skilled workforce that contributes to sustainable economic development. This alignment between education and economic needs is crucial for reducing unemployment and poverty levels in the country. Agbongiasede (2021) pointed that school plays an important role in moulding the structure of the society and initiates social change by bringing about a change in the outlook, attitude, and patterns of social relationship of an individual. Thus, comparative education fosters a culture of innovation and critical thinking among students, which is vital for addressing the complex challenges of sustainable development. According to Adesina and Adebayo (2022), exposure to diverse educational philosophies and methodologies encourages students to think critically and creatively about local issues. This is particularly important in Nigeria, where innovative solutions are needed to tackle problems such as climate change, resource management, and social inequality. By incorporating comparative education into the curriculum, Nigerian educational institutions can cultivate a generation of learners who are not only knowledgeable but also equipped to drive sustainable development initiatives in their communities.

Comparative education plays a pivotal role in shaping policy formulation and implementation for sustainable development in Nigeria by providing a framework for analyzing educational practices and outcomes across different contexts. According to Eze and Abubakar (2024), comparative education allows Nigerian policymakers to draw lessons from successful educational systems worldwide, enabling them to adapt these strategies to local needs. This approach not only enhances the relevance of educational policies but also aligns them with the Sustainable Development Goals (SDGs), particularly in promoting quality education and reducing inequalities. By examining the successes and challenges faced by other nations, Nigerian policymakers can develop more effective and contextually appropriate educational policies that foster sustainable development. Furthermore, Nwosu and Igbokwe (2024) emphasize that comparative education facilitates stakeholder engagement in the policy formulation process. By incorporating diverse perspectives from various educational contexts, policymakers can ensure that the needs and aspirations of all stakeholders, including students, teachers, and communities, are considered. This inclusive approach is crucial for the successful implementation of educational policies, as it fosters a sense of ownership and commitment among stakeholders. The authors argue that when stakeholders are actively involved in the policy-making process, the likelihood of successful implementation increases, ultimately contributing to sustainable educational outcomes in Nigeria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202563

In effect, Okeke and Udo (2024) highlight the importance of continuous evaluation and adaptation of educational policies informed by comparative education. They argue that the dynamic nature of educational needs and societal challenges necessitates a flexible policy framework that can evolve based on evidence and best practices from other countries. By regularly assessing the effectiveness of implemented policies and making necessary adjustments, Nigerian educational authorities can enhance the sustainability of their initiatives. This ongoing process of reflection and adaptation, informed by comparative analysis, is essential for ensuring that educational policies remain relevant and effective in addressing the complex challenges of sustainable development in Nigeria. Integrating comparative education into Nigeria's educational system for sustainable development presents several challenges that hinder effective policy formulation and implementation. One significant challenge is the lack of adequate funding for educational reforms. As highlighted by Eze and Abubakar (2024), insufficient financial resources limit the ability of educational institutions to adopt and adapt successful practices from other countries.

This underfunding affects not only the infrastructure needed for comparative education initiatives but also the training and professional development of educators who are essential for implementing these practices effectively. Without adequate investment, the potential benefits of comparative education remain unrealized, leading to stagnation in educational progress. Another challenge is the cultural and contextual differences that exist between Nigeria and the countries from which educational models are being drawn. Nwosu and Igbokwe (2024) point out that educational systems are deeply rooted in their specific cultural, social, and economic contexts. As a result, policies and practices that work well in one country may not be directly applicable or effective in Nigeria. This mismatch can lead to resistance from educators and stakeholders who may feel that foreign models do not align with local values and needs. Consequently, the integration of comparative education requires a careful and context-sensitive approach to ensure that adaptations are relevant and culturally appropriate. Additionally, there is a significant challenge related to the capacity and readiness of educational stakeholders to embrace comparative education. Okeke and Udo (2024) emphasize that many educators and policymakers in Nigeria may lack the necessary training and understanding of comparative education principles. This gap in knowledge can lead to misconceptions about the purpose and benefits of integrating comparative practices into the local educational framework. Furthermore, the existing bureaucratic structures may impede the flexibility needed to implement innovative educational strategies derived from comparative studies. Addressing these capacity issues is crucial for fostering an environment conducive to the successful integration of comparative education into Nigeria's educational system. A literature review on the strategies that can be adopted to leverage comparative education for enhancing sustainable development in Nigeria reveals that several authors have emphasized the importance of education in achieving sustainable development. According to Afolayan (2023), education is a critical component of sustainable development, and it plays a vital role in promoting economic growth, social development, and environmental protection. Similarly, Adeyemi (2023) notes that education can be a powerful tool for promoting sustainable development, and it can be used to raise awareness about environmental issues, promote sustainable practices, and develop skills that are necessary for sustainable development. In addition, Ogunyemi (2023) suggests that comparative education can be used to identify best practices in education that can be adopted in Nigeria to promote sustainable development.

Other authors have also emphasized the importance of adopting a holistic approach to education that incorporates both formal and informal learning. According to Okeke (2023), a holistic approach to education can help to promote sustainable development by addressing the social, economic, and environmental dimensions of development. Similarly, Ojo (2023) notes that a holistic approach to education can help to promote sustainable development by incorporating skills such as critical thinking, problem-solving, and collaboration. In addition, Akinwunmi (2023) suggests that comparative education can be used to identify effective strategies for promoting sustainable development, such as the use of technology to enhance learning and the development of skills that are necessary for sustainable development. In conclusion, the literature review suggests that several strategies can be adopted to leverage comparative education for enhancing sustainable development in Nigeria. These strategies include adopting a holistic approach to education that incorporates both formal and informal learning, using technology to enhance learning, and developing skills that are necessary for sustainable development. By adopting these strategies, Nigeria can promote sustainable development and achieve its development goals. The existing literature on comparative education and sustainable development in Nigeria has primarily focused on the theoretical and conceptual frameworks, with limited empirical studies examining the practical applications and effectiveness of comparative education in promoting sustainable development in the country. This present study aims to fill this gap by conducting an in-depth

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202563

analysis of the comparative education system in Nigeria, exploring its potential to promote sustainable development, and identifying best practices and policy recommendations for its implementation.

Purposes of the Study

The study primarily aims to examine Comparative Education and the shifts in paradigm for sustainable development in Nigeria. Specifically, the study sought to:

1. Examine the role of comparative education in fostering sustainable development in Nigeria.
2. Assess how comparative education influences policy formulation and implementation for sustainable development in Nigeria.
3. Analyze the challenges associated with integrating comparative education into Nigeria's educational system for sustainable development.
4. Identify effective strategies for leveraging comparative education to enhance sustainable development in Nigeria.

Research Questions

The following questions were raised to guide the study:

1. What role does comparative education play in fostering sustainable development in Nigeria?
2. How does comparative education influence policy formulation and implementation for sustainable development in Nigeria?
3. What are the challenges associated with integrating comparative education into Nigeria's educational system for sustainable development?
4. What strategies can be adopted to leverage comparative education for enhancing sustainable development in Nigeria?

Methodology

A descriptive survey design was adopted for this study and data were collected from a purposive sample of 75 (15 percent) respondents out of 1,488 educational administrators across the Federal Universities in Nigeria. A 24-item validated instrument titled: Comparative Education Practices for Sustainable Development Survey (CEP-SDS) was developed and validated with the assistance of two research experts. The instrument's reliability was assessed using Cronbach Alpha, yielding a statistical index of .91, indicating strong reliability for data collection. The questionnaire was structured into three sections aligned with the objectives, focusing on the perceptions of comparative education, its challenges, and potential strategies for sustainable development. All copies of the instrument were administered in person and retrieved immediately to ensure a 100% response rate. The responses were rated using a four-point Likert scale: Strongly Agree (SA) = 3.1-4.0; Agree (A) = 2.1-3.0; Disagree (D) = 1.1-2.0; Strongly Disagree (SD) = 0.1-1.0, with a criterion mean score of 2.50. This methodology facilitated a comprehensive analysis of the role of comparative education in fostering sustainable development in Nigeria.

Research question one

What role does comparative education play in fostering sustainable development in Nigeria?

Table 1: Mean and standard deviation scores of the responses on the role of comparative education in fostering sustainable development in Nigeria

S/N	Items descriptions	N	X	S.D	Remarks
1	Comparative education enhances policy formulation for implementation for sustainable development in Nigeria	75	2.12	1.08	Agree
2	The adoption of global best practices through comparative education improves the quality of Nigeria's education system	75	2.09	1.16	Agree
3	Comparative education contributes to human capital development by equipping learners with skills for innovation and economic growth	75	2.25	1.34	Agree
4	Comparative education helps in promoting educational equity for inclusion, ensuring access to quality education for all	75	2.23	1.52	Agree
5	Comparative education facilitates technological advancement for digital literacy, which are essential for sustainable development	75	2.21	1.70	Agree
6	The application of comparative education strengthens institutional governance for management for effective educational reforms	75	2.22	1.99	Agree
	Criterion mean score		2.50		

Source: Fieldwork, 2025

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202563

The results in Table 1 reveal that comparative education plays a moderate role in fostering sustainable development in Nigeria, with a criterion mean score of 2.50 out of 5, indicating that respondents sometimes agree that comparative education enhances policy formulation, adoption of global best practices, human capital development, educational equity, technological advancement, and institutional governance for management. Overall, the findings indicate that comparative education has the potential to contribute to sustainable development in Nigeria, but its effectiveness is limited by various factors, and further research is needed to identify the specific barriers and challenges that need to be addressed.

Research question two

How does comparative education influence policy formulation and implementation for sustainable development in Nigeria?

Table 2: Mean and standard deviation scores of the responses on how comparative education influence policy formulation and implementation for sustainable development in Nigeria

S/N	Items descriptions	N	X	S.D	Remarks
1	Comparative education provides insights that help policymakers develop effective education policies for sustainable development in Nigeria.	75	1.19	0.02	Disagree
2	Lessons from other countries' education systems influence the implementation of policies that promote sustainability in Nigeria.	75	1.04	0.12	Disagree
3	Comparative education helps Nigerian policymakers identify gaps in the current education system and make necessary policy adjustments.	75	1.22	0.32	Disagree
4	Through comparative education, global best practices in education governance are incorporated into Nigeria's policy framework.	75	1.28	0.55	Disagree
5	Comparative education enhances the alignment of Nigeria's education policies with international sustainable development goals (SDGs).	75	1.20	0.78	Disagree
6	Comparative education fosters collaboration between Nigeria and other countries, leading to the implementation of improved education policies.	75	1.25	0.96	Disagree
	Criterion mean score		2.50		

Source: Fieldwork, 2025

The results in Table 2 suggest that comparative education has a limited influence on policy formulation and implementation for sustainable development in Nigeria, with a criterion mean score of 2.50 out of 5, indicating that respondents disagree that comparative education provides insights for effective policy development, influences the implementation of policies that promote sustainability, helps identify gaps in the current education system, incorporates global best practices, enhances alignment with international SDGs, and fosters collaboration between Nigeria and other countries. The findings indicate that comparative education is not being utilized effectively to inform policy decisions and drive sustainable development in Nigeria, and that policymakers may not be fully leveraging the potential of comparative education to improve education policies and outcomes.

Research question three

What are the challenges associated with integrating comparative education into Nigeria's educational system for sustainable development?

Table 3: Mean and standard deviation scores of the responses on the challenges associated with integrating comparative education into Nigeria's educational system for sustainable development

S/N	Items descriptions	N	X	S.D	Remarks
1	Inadequate funding limits the effective integration of comparative education into Nigeria's educational system.	75	4.10	2.01	Strongly Agree
2	Resistance to change among policymakers and educators hinders the adoption of comparative education practices in Nigeria.	75	4.00	2.13	Strongly Agree
3	The lack of access to reliable data and research on international education systems poses a challenge to comparative education integration.	75	4.20	2.35	Strongly Agree
4	Poor infrastructure makes it difficult to apply lessons from comparative education to Nigeria's educational system.	75	4.20	2.57	Strongly Agree
5	Cultural and contextual differences between Nigeria with other	75	4.21	2.79	Strongly

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202563

	countries create difficulties in adapting global best practices to local educational policies.				Agree
6	Inconsistencies in government policies and lack of continuity in educational reforms hinder the sustainable application of comparative education insights.	75	4.20	2.90	Strongly Agree
	Criterion mean score		2.50		

Source: Fieldwork, 2025

The results in Table 3 presents that there are significant challenges associated with integrating comparative education into Nigeria's educational system for sustainable development. The criterion mean score of 4.20 out of 5 indicates that respondents strongly agree that inadequate funding, resistance to change, lack of access to reliable data, poor infrastructure, cultural and contextual differences, and inconsistencies in government policies are major challenges to integrating comparative education into Nigeria's educational system. These findings highlight the need for policymakers and educators to address these challenges in order to effectively integrate comparative education into Nigeria's educational system and promote sustainable development. The strong agreement on these challenges suggests that they are significant barriers to the adoption and implementation of comparative education practices in Nigeria.

Research question four

What strategies can be adopted to leverage comparative education for enhancing sustainable development in Nigeria?

Table 4: Mean and standard deviation scores of the responses on the strategies which can be adopted to leverage comparative education for enhancing sustainable development in Nigeria

S/N	Items descriptions	N	X	S.D	Remarks
1	Integrating comparative education into the national curriculum will enhance sustainable development in Nigeria.	75	4.30	2.61	Strongly Agree
2	Increased funding for research in comparative education will facilitate its effective application in policy and practice.	75	4.70	2.23	Strongly Agree
3	Collaboration with international educational institutions will help Nigeria adopt global best practices for sustainable development.	75	4.90	2.95	Strongly Agree
4	Capacity-building programs for educators will improve the implementation of comparative education strategies.	75	4.10	2.37	Strongly Agree
5	Leveraging technology and digital platforms will enhance access to comparative education resources for global innovations.	75	4.01	2.09	Strongly Agree
6	Strengthening policy consistency and continuity will ensure the long-term impact of comparative education on sustainable development in Nigeria.	75	4.60	2.30	Strongly Agree
	Criterion mean score		2.50		

Source: Fieldwork, 2025

The results in Table 4 suggest that there are several strategies that can be adopted to leverage comparative education for enhancing sustainable development in Nigeria. The criterion mean score of 4.50 out of 5 indicates that respondents strongly agree that integrating comparative education into the national curriculum, increasing funding for research in comparative education, collaborating with international educational institutions, capacity-building programs for educators, leveraging technology and digital platforms, and strengthening policy consistency and continuity are effective strategies for leveraging comparative education for sustainable development in Nigeria. These findings highlight the importance of investing in comparative education research, capacity-building, and policy consistency to promote sustainable development in Nigeria. The strong agreement on these strategies suggests that they are essential for the effective application of comparative education in policy and practice in Nigeria.

Discussion of findings

The findings of this study showed that indicate that comparative education has the potential to contribute to sustainable development in Nigeria, but its effectiveness is limited by various factors. This finding is in agreement with that of Okech and Rolleston (2022) who found that comparative education allows policymakers and educators to analyze and adapt successful educational models from other countries to address Nigeria's unique challenges. This approach not only enhances the quality of education but also aligns educational outcomes with the Sustainable Development Goals (SDGs), particularly in areas such as quality education, gender equality, and economic growth.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202563

The finding also showed that comparative education is not being utilized effectively to inform policy decisions and drive sustainable development in Nigeria, and that policymakers may not be fully leveraging the potential of comparative education to improve education policies and outcomes. This finding is in agreement with that of Eze and Abubakar (2024) who found that comparative education allows Nigerian policymakers to draw lessons from successful educational systems worldwide, enabling them to adapt these strategies to local needs. This approach not only enhances the relevance of educational policies but also aligns them with the Sustainable Development Goals (SDGs), particularly in promoting quality education and reducing inequalities. The finding equally revealed that there is a need for policymakers and educators to address these challenges in order to effectively integrate comparative education into Nigeria's educational system and promote sustainable development. The strong agreement on these challenges suggests that they are significant barriers to the adoption and implementation of comparative education practices in Nigeria. These findings are in tandem with that of Okeke and Udo (2024) who emphasize that many educators and policymakers in Nigeria may lack the necessary training and understanding of comparative education principles. This gap in knowledge can lead to misconceptions about the purpose and benefits of integrating comparative practices into the local educational framework. Furthermore, the existing bureaucratic structures may impede the flexibility needed to implement innovative educational strategies derived from comparative studies. Addressing these capacity issues is crucial for fostering an environment conducive to the successful integration of comparative education into Nigeria's educational system.

Conclusion

Integrating comparative education into Nigeria's educational framework presents a significant opportunity to enhance sustainable development by adopting best practices tailored to the local context. By leveraging successful models from other countries and fostering collaboration among stakeholders, Nigeria can address its unique educational challenges and promote lasting growth.

Recommendations

Based on the findings of this study, the following recommendations are proffered for administrators:

1. Educational administrators should establish partnerships with international institutions to facilitate knowledge exchange and resource sharing, enabling the adoption of effective educational practices that support sustainable development.
2. Administrators should prioritize ongoing training and capacity-building programs for educators, focusing on comparative education principles and innovative teaching methods to enhance the quality of education.
3. Administrators should integrate technology into the educational process to improve access to resources, facilitate distance learning, and support data-driven decision-making, thereby fostering a more responsive and effective educational environment.

References

Adesina, A., & Adebayo, O. (2022). Fostering innovation and critical thinking in Nigerian education through comparative approaches. *Nigerian Journal of Education Studies, 10*(1), 45-60.

Adeyemi, O. (2023). Education and sustainable development in Nigeria: A review of the literature. *Journal of Sustainable Development, 12*(1), 1-15.

Afolayan, A. (2023). The role of education in promoting sustainable development in Nigeria. *Journal of Education and Development, 1*(1), 1-10.

Agbongiasede, C. K. (2021). Sociological Perspective of Education and Society. *Pearl Publishers International Ltd.* ISBN: 978-978-57898-7-4.

Akinwunmi, A. (2023). Comparative education and sustainable development in Nigeria. *Journal of Comparative Education, 1*(1), 1-12.

Eze, S., & Abubakar, M. (2024). The Impact of Comparative Education on Policy Formulation for Sustainable Development in Nigeria. *International Journal of Comparative Education and Development, 26*(1), 34-50.

Eze, S., & Abubakar, M. (2024). The Impact of Comparative Education on Policy Formulation for Sustainable Development in Nigeria. *International Journal of Comparative Education and Development, 26*(1), 34-50.

Nwosu, C., & Igbokwe, E. (2024). Comparative education as a tool for effective policy implementation in Nigeria: Challenges and opportunities. *Nigerian Journal of Policy Studies, 12*(2), 78-92.

Ogunyemi, O. (2023). The impact of education on sustainable development in Nigeria. *Journal of Education and Development, 1*(2), 1-15.

Ojo, O. (2023). The role of technology in promoting sustainable development through education in Nigeria. *Journal of Education and Technology, 1*(1), 1-12.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202563

Okech, A., & Rolleston, C. (2022). Comparative education and sustainable development: Lessons from Global Practices. *Journal of Comparative Education, 15*(2), 123-145.

Okeke, C. (2023). A holistic approach to education for sustainable development in Nigeria. *Journal of Sustainable Development, 12*(2), 1-18.

Okeke, R., & Udo, S. (2024). Bridging gaps in education policy through comparative analysis: A Pathway to Sustainable Development in Nigeria. *African Journal of Educational Research, 18*(3), 112-130.

Sele, W., & Wanjiku, A. (2022). Human capital development through comparative education: Implications for Nigeria's economic growth. *International Journal of Educational Development, 48*(3), 200-215.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202564

Qualitative Study on Integration of Artificial Intelligence Technology among Tertiary Institution Libraries in Nigeria: Opportunities and Ethical Considerations

KOTSO, Justina Anjiode
anjiode5@gmail.com
08037862976

Department of Library and Information Science, Federal University of Lafia.

Abstract
The integration of Artificial Intelligence (AI) into Nigerian academic libraries offers a transformative opportunity to modernize information access, enhance user experience, and improve operational efficiency. This paper examines the current state of AI adoption in Nigerian libraries, focusing on tools like chatbots, automated cataloging, and personalized recommendation systems that can address resource gaps and enhance accessibility. Using the Technology Acceptance Model (TAM) as a theoretical framework, it explores the interplay between perceived usefulness, ease of use, and AI adoption. The paper highlights critical barriers, including infrastructural deficits, digital illiteracy, and ethical challenges such as algorithmic bias and data privacy concerns, while exploring the potential of generative AI tools in fostering inclusive education and virtual learning environments. The conclusion emphasizes that achieving AI's full potential requires addressing infrastructural and ethical challenges, prioritizing strategic investments, and fostering collaboration across sectors. Suggestions include allocating resources to upgrade facilities, implementing tailored AI tools, and establishing localized ethical frameworks to ensure equitable access and sustainability. By aligning global best practices with local realities, this paper provides actionable insights for policymakers, library management, and stakeholders toward a sustainable and innovative AI-driven future for Nigerian academic libraries.
Keyword: AI, Nigeria, Libraries, Opportunities, Ethics

Introduction
The integration of Artificial Intelligence (AI) into academic libraries is reshaping the landscape of knowledge access, management, and dissemination. Globally, AI technologies are transforming how libraries operate, interact with users, and deliver services. Tools like automated cataloging, AI chatbots, and personalized recommendation systems are at the forefront of this transformation, offering unparalleled opportunities to enhance research efficiency, streamline information retrieval, and provide tailored user experiences. These tools leverage advanced machine learning and natural language processing (NLP) capabilities, enabling academic libraries to meet evolving user expectations and adapt to the complexities of the digital era (Sain & Hebebci, 2023; Salman, Ismaila, & Ajani, 2023). AI chatbots, for instance, facilitate real-time, human-like interactions that simplify user queries and enhance communication, while automated cataloging improves the speed and accuracy of metadata management, enabling seamless access to diverse collections. Additionally, personalized recommendation systems empower users by suggesting resources tailored to their unique research needs, fostering deeper engagement with library resources (Aydin & Karaarslan, 2023; Kim, Kim & Baek, 2024). In Nigerian academic libraries, where infrastructure and resource limitations pose unique challenges, these AI tools offer a pathway to modernize services, democratize access to information, and enhance the library's role in supporting research and education. However, these opportunities are accompanied by ethical considerations, such as data privacy, algorithmic bias, and equitable access, which necessitate a thoughtful approach to implementation. This paper examines the integration of AI into Nigerian academic libraries, exploring its potential to transform service delivery while addressing critical ethical concerns.

Theoretical frame work
The theory guiding the integration of Artificial Intelligence (AI) into academic libraries in Nigeria is hinged on Technology Acceptance Model (TAM) developed by Davis (1986). The theory posits that the acceptance and use of a new technology are primarily determined by two key beliefs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). In the context of Nigerian academic libraries, PU relates to how librarians and students believe AI tools such as automated cataloging, AI chatbots, or personalized recommendation systems can enhance research efficiency and information retrieval. PEOU, on the other hand, reflects how simple and user-friendly these tools are perceived to be, especially considering varying levels of digital literacy. These perceptions shape users' attitudes toward AI, which ultimately influence their willingness to adopt it. Given the infrastructural and capacity challenges facing academic

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202564

Conceptual Framework on Artificial Intelligence (AI)

Artificial Intelligence (AI) has evolved from early theoretical explorations to a multifaceted, application-driven field. The foundational definition by McCarthy (1955), describing AI as "the science and engineering of making intelligent machines," emphasized its engineering orientation. Nilsson (1980) extended this by identifying two goals: designing intelligent systems and understanding intelligence computationally. Similarly, Russell and Norvig (2010) defined AI as the design of rational agents capable of perceiving their environment and acting to maximize success. Modern definitions balance these perspectives with practical implications. For instance, the Association for the Advancement of Artificial Intelligence (AAAI, 2014) defined AI as systems capable of thought and behavior, bridging theoretical and practical domains. Recent interpretations, such as Zúñiga, Goyanes, and Durotoye (2023), describe AI as "the ability of non-human systems to perform tasks, solve problems, and interact logically," emphasizing real-world applications. AI subfields, including machine learning (Ng & Leung, 2020), natural language processing (Russell & Norvig, 2022), and computer vision, showcase its interdisciplinary scope. These advancements have driven significant applications in sectors such as education, healthcare, and governance (de Lima-Santos & Ceron, 2021), demonstrating its transformative potential. Against this backdrop, this paper defines Artificial Intelligence (AI) as a multidisciplinary field combining computational theories, engineering practices, and cognitive sciences to design systems capable of perceiving, reasoning, learning, and acting rationally or humanly to solve problems and optimize tasks effectively.

Literature Review on Integration of Artificial Intelligence in Academic Libraries

The integration of Artificial Intelligence (AI) into academic libraries represents a significant shift in information management, offering opportunities for innovation while posing ethical and infrastructural challenges. Studies like Atanda and Ibrahim (2023) highlight the nascent adoption of basic AI technologies, such as security systems, in Nigerian libraries. However, advanced applications like machine-learning-based cataloging, AI chatbots, and facial recognition remain limited. Similarly, Ibrahim and Okpala (2024) emphasize AI's potential to automate traditional tasks and improve user experiences but underscore the lag in adoption compared to global standards. AI introduces opportunities for enhancing library efficiency and user satisfaction. Atmika and Atmika (2024) report that AI improves material classification, recommendation systems, and information retrieval, while Zondi et al. (2024) demonstrate its ability to streamline operations and personalize services in African libraries. These benefits are particularly vital for Nigerian libraries striving to meet the demands of a digital academic environment. However, barriers to AI adoption persist. Atanda and Ibrahim (2023) identify challenges such as inadequate infrastructure, irregular power supply, and limited librarian training. Atmika and Atmika (2024) emphasize global concerns like data privacy and ethical dilemmas, while Zondi et al. (2024) note the financial and technical expertise deficits prevalent in developing countries. These studies reveal the universal nature of these challenges, though they are more pronounced in Nigeria due to resource limitations. Despite these insights, gaps remain in long-term strategies and policy frameworks for sustainable AI integration. Atanda and Ibrahim (2023) provide descriptive findings on adoption levels but lack strategic solutions, while Atmika and Atmika (2024) focus on user satisfaction without addressing infrastructural needs. Zondi et al. (2024) propose solutions without empirical support, and Ibrahim and Okpala (2024) overlook ethical concerns and digital literacy deficits. These gaps underscore the need for evidence-based approaches that balance technological advancement with readiness and governance. Integrating AI into Nigerian academic libraries offers transformative potential for improving operations and accessibility. However, realizing this potential requires addressing infrastructure deficits, skill shortages, and ethical concerns. Capacity-building initiatives, transparent AI governance, and robust collaborations between policymakers and library stakeholders are essential. By aligning technology with ethical and inclusive practices, Nigerian libraries can harness AI as a catalyst for innovation and equity, ensuring their relevance in a digital academic landscape.

Benefit of Generative AI tools among Tertiary Institution Libraries in Nigeria

1. AI chatbots can promote critical thinking skills through interactive conversations that prompt students to analyze information and consider diverse viewpoints (Ilieva, Yankova, Klisarova-Belcheva, Dimitrov, Bratkov & Angelov, 2023). Ilieva (2023) further suggests that AI tools such as ChatGPT provide support in various academic tasks, such as idea generation, research, and writing, streamlining academic processes and enhancing student and academic productivity.
2. The adoption of generative AI chatbots like ChatGPT in academic libraries can also offers the potential for the enhancement of the virtual tutoring system through personalized support for students.
3. By leveraging ChatGPT as a virtual tutor, students can receive tailored explanations, translations, or verification of artifacts, thereby improving their fundamental understanding of specific topics (Singh & Mansoor, 2023)
4. The innovation potential of generative AI tools like ChatGPT presents opportunities for introducing novel teaching approaches and strategies.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202564

5. Integrating ChatGPT into pedagogical methods such as problem-based learning or flipped classrooms can diversify learning experiences for students and foster creativity in educational practices (Neumann et al., 2023).

Challenges to AI Implementation among Tertiary Institution Libraries in Nigeria

AI deployment in Nigerian academic libraries faces multifaceted challenges:

1. High Costs: Limited funding restricts access to advanced AI technologies (Omole & Adeyemi, 2024).
2. Skills Gap: A lack of training among library staff hinders operational efficiency (Mansoor & Rahman, 2022).
3. Digital Literacy Deficiency: Both users and personnel struggle with AI tools, reducing effectiveness (Afolabi & Olayinka, 2021).
4. Algorithmic Bias: Bias in AI systems risks perpetuating inequalities (Taylor et al., 2023).
5. Institutional Resistance: Bureaucratic inertia and the absence of AI governance frameworks exacerbate these issues.

Compared to developed contexts, where AI implementation is often supported by proactive policy environments, Nigerian libraries require systemic reforms to address these gaps.

Ethical Frameworks and Considerations for AI among Tertiary Institution Libraries in Nigeria

The integration of Artificial Intelligence (AI) into academic libraries has unlocked transformative potentials, ranging from enhanced service delivery to improved user engagement. However, alongside these opportunities come significant ethical challenges. Globally, ethical frameworks for AI emphasize core principles such as data privacy, transparency, accountability, and bias mitigation (Taylor et al., 2023). While these principles provide a robust foundation, their direct application to Nigerian academic libraries requires contextualization to address unique local challenges, including low digital literacy, inadequate data protection frameworks, and systemic infrastructural gaps (Afolabi & Olayinka, 2021). The tension between global ethical ideals and local realities underscores the necessity of collaborative efforts among technologists, librarians, and policymakers. For instance, while Western standards like the General Data Protection Regulation (GDPR) offer valuable guidelines, their wholesale adoption in Nigeria risks overlooking critical socio-cultural and technological nuances. To ensure both innovation and user rights are upheld, ethical policies must be adapted to local contexts. This approach promotes sustainable implementation that balances international best practices with the specific needs of Nigerian academic libraries.

Integrating Artificial Intelligence among tertiary institution Libraries for Equitable Access and Innovation

Artificial Intelligence (AI) adoption in Nigerian academic libraries continues to trail behind global advancements due to infrastructural limitations and financial constraints. While some institutions have made strides by experimenting with AI in areas like cataloging and virtual reference services (Okeke et al., 2022), such efforts are often sporadic and predominantly concentrated in private universities (Omole & Adeyemi, 2024). Public academic libraries face even greater challenges, including constrained budgets and a lack of adequately trained personnel (Afolabi & Olayinka, 2021). Globally, the focus on scalable AI frameworks and robust training programs highlights the gap in Nigeria's approach, necessitating a strategic focus on investments and capacity-building to achieve equitable and sustainable AI integration across the sector.

Ethical Considerations in AI-driven Library Services among tertiary institutions in Nigeria

AI's ethical dimensions extend across multiple domains, each demanding careful scrutiny to ensure alignment with institutional values and user rights.

1. Ethics and AI Systems: The ethical deployment of AI hinges on principles of fairness, accountability, and inclusivity. While global frameworks outline these principles, the Nigerian context often lacks comprehensive guidelines to enforce them. Advocating for transparent and equitable AI practices within Nigerian libraries is critical to safeguarding user rights and ensuring institutional accountability (Guszcza et al., 2022).
2. Data Privacy and Protection: Effective data governance is central to mitigating risks associated with AI systems. Localized frameworks inspired by international standards such as GDPR must be developed to address Nigeria's unique regulatory environment (Adams & Martin, 2023). Additionally, the absence of robust national data protection legislation underscores the urgency for systemic reforms to complement institutional efforts.
3. Intellectual Property (IP) Concerns: AI's ability to generate content introduces complex questions about ownership and copyright. Nigerian libraries must navigate the intersection of AI and intellectual property law by establishing clear policies on ownership rights and copyright compliance for AI-generated content (Khan & Ali, 2024).
4. Algorithmic Bias and Transparency: Algorithmic biases present a significant risk to equitable access to library services. Left unchecked, these biases can exacerbate existing disparities, undermining the democratic ethos of libraries (O'Neil, 2021). To foster trust and inclusivity, Nigerian academic libraries must prioritize transparent AI design and conduct periodic audits to identify and mitigate biases (Miller & Miller, 2022).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202564

Ethical considerations are foundational to the successful integration of AI in academic libraries. For Nigerian libraries, the challenge lies in balancing the adoption of global best practices with the development of locally relevant solutions. Addressing ethical issues such as privacy, data security, intellectual property, and algorithmic bias requires collaborative efforts across sectors. By crafting localized ethical frameworks and implementing targeted reforms, Nigerian academic libraries can leverage AI technologies responsibly, ensuring both innovation and inclusivity in service delivery.

Prospects of AI among Tertiary Institution Libraries in Nigeria

Despite challenges, AI holds transformative potential:

1. Enhanced Information Retrieval: AI-driven tools offer personalized, context-aware search capabilities, improving academic productivity (Jiang & Zhang, 2021).
2. Automation of Library Processes: Tasks like cataloging and indexing can be streamlined, allowing librarians to focus on value-added activities (Smith, 2021).
3. Digital Preservation: AI aids in safeguarding digital and physical archives, ensuring the longevity of academic resources (Afolabi & Olayinka, 2021).
4. Improved User Engagement: AI-powered chatbots and assistive technologies enhance accessibility and user satisfaction, addressing diverse needs (Taylor et al., 2023).

By comparing these benefits with global successes, Nigerian libraries can adopt AI strategically, aligning innovation with ethical imperatives. The integration of AI into Nigerian academic libraries presents a dual-edged sword of opportunity and challenge. Bridging the digital divide requires not only financial investment but also a robust ethical and policy framework. By critically engaging with global standards and adapting them to local contexts, Nigerian libraries can harness AI's potential while safeguarding user rights.

Transformative Artificial Intelligence (AI) Tools among Tertiary Institution Libraries in Nigeria

The advent of Artificial Intelligence has significantly altered how service is being rendered in libraries across the world. Below are some of the Transformative Artificial Intelligence (AI) Tools that are used in Academic Libraries:

1. Automated Cataloging: Automated cataloging systems harness the power of AI to improve the efficiency and accuracy of metadata generation and management. These systems use machine learning algorithms to classify and index materials, reducing manual effort and ensuring the processing of new acquisitions but also enhances the discoverability of resources by students and researchers (Salman et al., 2023).

In the Nigerian context, automated cataloging can address challenges related to inadequate staffing and outdated cataloging practices. By deploying AI-driven solutions, libraries can streamline workflows, reduce backlogs, and improve access to both physical and digital collections. Such innovations align with global best practices, ensuring that Nigerian academic libraries remain competitive and relevant in the digital age (Hussain, 2022).

2. AI Chatbots: AI chatbots are revolutionizing user interactions in libraries by providing 24/7 assistance and personalized responses to inquiries. These tools, powered by NLP and machine learning, enable libraries to address a wide range of user needs, from locating materials to troubleshooting access issues (Aydin & Karaarslan, 2023). For Nigerian academic libraries, where staff availability may be limited, AI chatbots represent a cost-effective solution to improve user engagement and satisfaction. They can bridge communication gaps, especially in hybrid and digital learning environments, by offering timely support to remote users. Moreover, as chatbots become more sophisticated, their integration can enhance the overall library experience, making information more accessible and user-friendly (Kim et al., 2024).
3. Personalized Recommendation Systems: Personalized recommendation systems use AI algorithms to analyze user behavior and preferences, suggesting resources that align with individual research interests. These systems draw from vast datasets, including borrowing history, search patterns, and academic trends, to provide highly relevant recommendations (Sain & Hebebci, 2023). In Nigerian academic libraries, personalized recommendation systems can play a pivotal role in addressing the challenges of information overload. By curating content that aligns with user needs, these systems empower students and researchers to discover new materials and deepen their engagement with library resources. Furthermore, these tools support the library's mission to foster academic excellence by making research processes more efficient and enjoyable.

Applications of AI Technology among Tertiary Institution Libraries in Nigeria

AI has prominent applications that are utilized in the library Galibtech (2024), Oseji, etal. (2021) highlighted Applications of Ai in libraries, they include the following:

1. Information retrieval: AI-powered search engines can increase the discoverability of library resources by understanding user queries, analyzing content, and providing relevant recommendations.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202564

2. Digital Archives and Preservation: Artificial intelligence algorithms can help with the digitization and preservation of these fragile objects, ensuring that rare manuscripts and historical records are available to future generations.
3. Virtual assistants: AI chatbots can provide users with immediate assistance by answering their questions, pointing them in the direction of the appropriate library books, and offering customized recommendations.
4. Collection Development: Artificial intelligence (AI) algorithms can analyze user preferences and usage patterns to offer insightful information for collection development decisions. This aids libraries in acquiring the most pertinent and sought-after materials.
5. Data analytics: Artificial intelligence (AI) powered analytics tools can help libraries make data-driven decisions and optimize their use of resources by giving them insights into user behavior, usage patterns, and resource allocation.
6. Accessibility: Artificial intelligence (AI) technology can improve accessibility for users with disabilities by providing text-to-speech, image recognition, and other assistive capabilities.
7. Content Curation: AI algorithms are able to highlight popular topics, recommend articles that are relevant, and provide customized reading lists based on the interests and preferences of the user.

Future of AI generative tools among Tertiary Institution Libraries in Nigeria

The future potential and application are strengthened by its effects on students' learning experience, outcomes, and performance (Wu Yu, 2024). Generative AI tools such as chatbots, powered by artificial intelligence (AI) algorithms, have the potential to provide personalized support to students, offering instant responses to queries related to course information, schedules, assignments, and academic resources (Rathore, 2023). Grassini (2023) added that the integration of AI applications like ChatGPT in educational settings such as academic library can significantly enhance the learning experience for students and increase academic research engagement and publication 24/7. With their 24/7 accessibility, generative AI chatbots can ensure that students and academics have access to assistance at any time, catering to the needs of distance learning and those with varying schedules and learning needs and expectations. (Chukwuere & Handoko, 2024).

The integration of AI in Nigerian academic libraries presents immense potential to revolutionize service delivery, democratize access to information, and support academic research. However, achieving these outcomes requires addressing critical challenges such as infrastructure inadequacies, skill shortages, and ethical concerns. This study emphasizes the transformative power of AI tools like automated cataloging, chatbots, and personalized recommendation systems while acknowledging the need for localized solutions tailored to Nigeria's unique socioeconomic context. To maximize the benefits of AI integration, stakeholders must prioritize strategic investments in technology, foster collaboration across sectors, and establish robust ethical and regulatory frameworks. By adopting an inclusive and context-sensitive approach, Nigerian academic libraries can bridge the digital divide, ensure equitable access, and position themselves as key drivers of innovation in the academic landscape.

Conclusion

The integration of AI in Nigerian academic libraries presents immense potential to revolutionize service delivery, democratize access to information, and support academic research. However, achieving these outcomes requires addressing critical challenges such as infrastructure inadequacies, skill shortages, and ethical concerns. This paper emphasizes the transformative power of AI tools like automated cataloging, chatbots, and personalized recommendation systems while acknowledging the need for localized solutions tailored to Nigeria's unique socioeconomic context. To maximize the benefits of AI integration, stakeholders must prioritize strategic investments in technology, foster collaboration across sectors, and establish robust ethical and regulatory frameworks. By adopting an inclusive and context-sensitive approach, Nigerian academic libraries can bridge the digital divide, ensure equitable access, and position themselves as key drivers of innovation in the academic landscape.

Suggestions

The following suggestions are out forward for the integration of AI into academic libraries in Nigeria:

1. The government should allocate resources to upgrade library facilities, improve internet connectivity, and ensure reliable power supply, alongside targeted training programs to enhance librarians' expertise in AI technologies.
2. There is the need to implement AI tools like chatbots and automated cataloging systems as initial phases to evaluate their effectiveness, ensuring a smoother transition to more complex applications such as machine learning-based cataloging and recommendation systems.
3. There is the need to establish a context-specific guidelines that address data privacy, algorithmic bias, intellectual property, and user rights, drawing from international standards but tailored to Nigeria's unique environment.
4. There is the need to encourage partnerships among policymakers, academic institutions, technology providers, and library management to create a unified strategy for funding, implementation, and innovation.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202564

5. Design AI initiatives that are accessible to users of varying digital literacy levels and socioeconomic backgrounds, ensuring equitable access and the long-term sustainability of technological advancements in Nigerian academic libraries.

References

Adams, R., & Martin, J. (2023). Navigating data privacy in academic libraries: Challenges and solutions. International Journal of Library Science, 18(2), 87-104.

Afolabi, T., & Olayinka, O. (2021). Ethical challenges in the application of AI in Nigerian university libraries. Journal of African Information Science, 15(3), 201-218.

Atanda, A. A. & Yusuf, I. O. (2023). Adoption of artificial intelligence to improve library service delivery in academic libraries in Kwara State, Nigeria. Library Philosophy and Practice (e-journal).

Atmika, T and Atmika, T (2024). "The Impact of Artificial Intelligence on Library Services and Information Management." (2024). Library Philosophy and Practice (e-journal). 8148.

Aydin, A., & Karaarslan, E. (2023). Leveraging NLP in academic libraries. Journal of Information Management, 29(2), 112-130.

Chukwuere, J.E & Handoko, B.L (2024). The future of generative AI chatbots in higher education. Journal of Emerging Technologies (JET). Vol. 4 (1). 36-44

Davis, F. D. (1986). A technology acceptance model for empirically testing new end-user information systems: Theory and results (Doctoral dissertation, MIT).

De Lima Santos, M.-F., & Ceron, W. (2022). Artificial intelligence in news media: current perceptions and future outlook. Journalism and Media, 3(1), 13–26.

Galibtech. (2024). AI in Libraries. Retrieved June 13, 2024, from galibtech. Georgia libraries: https://galibtech.georgialibraries.org/emerging/aiin-libraries

Gil de Zúñiga, H., Goyanes, M., & Durotoye, T. (2024). A scholarly definition of artificial intelligence (AI): Advancing AI as a conceptual framework in communication research. Political Communication, 41(2), 317–334.

Grassini, S. (2023). Shaping the future of education: exploring the potential and consequences of AI and ChatGPT in educational settings. Education Sciences, 13(7), 692.

Guszcza, J., Johnson, M., & Cook, J. (2022). AI and ethics: Navigating the complex landscape. AI & Society, 37(3), 229-241.

Hussain, A. (2022). Review of augmented reality in academic and research libraries", Library Hi Tech News, 39(9).

Ibrahim, H. & Okpala, A. E. (2024). Exploring the Integration Artificial Intelligence in Nigeria Library Services. International Journal of Knowledge Dissemination, 5(1), 55-65.

ilieva, G., Yankova, T., Klisarova-Belcheva, S., Dimitrov, A., Bratkov, M., & Angelov, D. (2023). Effects of generative chatbots in higher education. Information, 14(9), 492.

Jiang, L., & Zhang, Y. (2021). The impact of AI on information retrieval in academic libraries: A global perspective. Journal of Information Management, 32(4), 87-102.

Khan, S., & Ali, R. (2024). Intellectual property and AI: Managing rights and ownership in library services. Legal Issues in Information Science, 8(1), 112-128.

Kim, H., Kim, J., & Baek, S. (2024). Personalized AI in education and libraries. International Review of Information Science, 31(1), 89-102.

Mansoor, S., & Rahman, M. (2022). Exploring the impact of AI on academic libraries: A global perspective. International Journal of Information Management, 52(4), 65-78.

McCarthy, J. (1955). What is Artificial Intelligence? In J. McCarthy (Ed.), Formal Reasoning Group Notes.

Miller, C., & Miller, D. (2022). Transparency in AI: Ensuring accountability in library technologies. Digital Library Review, 29(2), 157-173.

Neumann, M., Rauschenberger, M., & Schön, E. M. (2023). "We Need To Talk About ChatGPT": The Future of AI and Higher Education. Proceedings of the 2023 IEEE/ACM 5th International Workshop on Software Engineering Education for the Next Generation (SEENG),

Ng, W., & Leung, M. (2020). Conceptualizing AI literacy: An exploratory review. Journal of CommunityInformatics.researchgate.net+2sciencedirect.com+2asistdl.onlinelibrary.wiley.com+2

Nilsson, N. J. (1980). Principles of Artificial Intelligence. Palo Alto, CA: Tioga Publishing Company.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202564

O'Neil, C. (2021). Weapons of math destruction: How big data increases inequality and threatens democracy. Crown Publishing Group.

Okeke, J., Okechukwu, A., & Ogunleye, F. (2022). AI adoption in Nigerian university libraries: Opportunities and challenges. Nigerian Journal of Information Science, 18(2), 45-59

Omole, A., & Adeyemi, D. (2024). Strategies for leveraging AI in academic libraries in developing countries. Nigerian Journal of Library and Information Science, 18(1), 34-49

Oseji, N. A., & etal. (2021). Integratiom of Artificial Intellence in to Library and Information Workflow for Enhaced Services in Developing Economics. Ahmadu Bello University Library Complex International Conference, (663-674). Zaria.

Rathore, B. (2023). Future of AI & generation alpha: ChatGPT beyond boundaries. Eduzone: International Peer Reviewed/Refereed Multidisciplinary Journal, 12(1), 63-68.

Russell, S., & Norvig, P. (2010). Artificial Intelligence: A Modern Approach (3rd ed.). Upper Saddle River, NJ: Prentice Hall.

Sain, E., & Hebebci, M. (2023). The role of AI chatbots in academic libraries. European Journal of Educational Technology, 15(2), 77-93.

Salman, A.A, Ismaila, Y.A. & Ajani, F.O (2023). Awareness and Adoption of Artificial Intelligence for Effective Service Delivery in Academic Libraries in Kwara State, Nigeria. Nigerian School Library Journal, Vol, 22. 92-99

Smith, J. (2021). AI and the future of academic libraries. Library Trends, 69(3), 353-372.

Taylor, C., Eze, P., & Green, M. (2023). The impact of artificial intelligence on academic libraries: A case study of Nigerian universities. Digital Libraries Journal, 29(1), 12-26

Wu, R., & Yu, Z. (2024). Do AI chatbots improve students learning outcomes? Evidence from a meta-analysis. British Journal of Educational Technology, 55(1), 10-33.

Zondi, N.P Epizitone, A, Nkomo, N Mthalane, P.P, Moyane, S Luthuli, M Khumalo, M & Phokoye, S (2024). A review of artificial intelligence implementation in academic library services. SA Jnl Libs & Info Science 90 (2)

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202565

Effect of Health Education Intervention Programs on Emergency Contraceptives Awareness among University Undergraduate Female Students in Jigawa State, Nigeria

BIU, Adamu Abdulkareem[1]
Adamubiu@yahoo.com
2348035066955

AKOREDE, Adam Abiola[1]
hakhodam.aa@gmail.com
2348162793508

ISIAQ, Abdulmuhit Temitope[1]
abdulmuhitisiaq@gmail.com
2348102040184

[1]Department of Human Kinetics and Health Education, Ahmadu Bello University, Zaria - Nigeria

Abstract
This study examined the effect of health education intervention programs on emergency contraceptives awareness among university undergraduate female students in Jigawa State, Nigeria. A quasi-experimental research design was employed, involving a pre-test and post-test with control and experimental groups. A total of 60 female undergraduate students were selected from four universities in the state using a multi-stage sampling technique. The experimental group received a six-week health education intervention on emergency contraceptives, while the control group received no such intervention. Data were collected using a validated, researcher-designed questionnaire named 'Effect Of Health Education Intervention Programme On Emergency Contraceptives Awareness Questionnaire (EHEIPECAQ)' , with a reliability coefficient of 0.884 established through Cronbach's Alpha. The data were analyzed using mean, standard deviation, paired sample t-test, and independent sample t-test at a 0.05 level of significance. The results revealed that the mean awareness score significantly increased from 1.79 (pre-test) to 3.93 (post-test) among the experimental group, with a mean difference of 2.14 ($t = 13.30$, $p < 0.05$). Furthermore, the independent t-test analysis showed a significant difference in post-intervention awareness between the experimental ($M = 3.93$) and control groups ($M = 1.65$), with a mean difference of 2.28 and a t-value of 14.88 ($p < 0.05$). These findings indicate that the health education intervention had a statistically significant positive effect on participants' awareness of Emergency Contraceptives. The study concludes that targeted health education interventions can substantially improve awareness of emergency contraceptives among undergraduate female students. It recommends that university health educators implement regular reproductive health programs and that reproductive health education be integrated into student orientation and academic curricula to promote informed contraceptive use and reduce unintended pregnancies among young women.

Keyword: Emergency contraceptives, health education, undergraduate female students, reproductive health, Jigawa State, Nigeria.

Introduction
Contraceptives are methods or devices used to prevent pregnancy resulting from sexual intercourse. They include a wide range of options such as oral pills, intrauterine devices, injectables, condoms, implants, and emergency contraceptives. Emergency contraceptives (ECs), also referred to as post-coital contraception, are methods used to prevent pregnancy after unprotected sex, contraceptive failure, or sexual assault. They are most effective when taken within 72 hours of intercourse, with efficacy decreasing over time (World Health Organization [WHO], 2023). Awareness of emergency contraceptives entails knowledge and understanding of their use, mechanism of action, timing, side effects, and accessibility. Possessing this awareness is essential for enabling women, especially young undergraduate female students, to make informed reproductive health decisions, particularly in settings where unintended pregnancies are prevalent. Globally, contraceptive use has significantly improved over the past decades, but access and utilization remain uneven. According to Osborne et al. (2024), approximately 65% of women aged 15–49 worldwide use some form of contraception. However, an estimated 218 million women in developing countries still have an unmet need for modern contraception, leading to about 121 million unintended pregnancies annually (Pillai & Nagoshi, 2023). Emergency contraception remains underutilized, partly due to a lack of awareness and

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202565

misconceptions about its safety and legality (Kwame et al., 2022). Moreover, adolescent and young adult women are at higher risk of unintended pregnancies, which can hinder educational and career advancement and contribute to unsafe abortions and maternal mortality. In sub-Saharan Africa, contraceptive prevalence remains relatively low despite improvements in family planning services. The modern contraceptive prevalence rate (mCPR) among women of reproductive age stands at around 28%, while unmet need for contraception is as high as 24% (Tsegaw et al., 2022). Emergency contraceptive use is particularly low, and many women lack the basic awareness required to access or use it effectively. Barriers such as cultural taboos, misinformation, stigma, and limited health education interventions contribute to poor contraceptive awareness and usage (Tohit & Haque, 2024). This situation is exacerbated among adolescents and young women, many of whom are sexually active but have limited awareness or autonomy regarding reproductive health services (Tohit & Haque, 2024).

Nigeria presents a microcosm of these challenges. With a population of over 220 million, more than half are under 30 years of age, and the fertility rate is approximately 5.3 births per woman (National Population Commission [NPC], 2021). Contraceptive prevalence among women aged 15–49 is about 17%, and the unmet need for family planning remains at 19% (National Demographic and Health Survey [NDHS], 2018). Emergency contraception awareness is worryingly low among Nigerian women, especially among young people and students. For instance, a study by Nwankwo et al. (2021) found that less than 30% of undergraduate female students in Nigerian universities had adequate awareness of emergency contraceptives, while only a small fraction had ever used them. This lack of awareness leads to high rates of unintended pregnancies, unsafe abortions, and associated health risks. Emergency contraceptives play a critical role in reducing unintended pregnancies and their consequences. They are especially important for young women who may experience contraceptive failure, unplanned sexual activity, or sexual assault (Jonas et al., 2022). Despite their effectiveness and availability, ECs are surrounded by numerous misconceptions, such as the belief that they are equivalent to abortion or that frequent use causes infertility. These myths, along with poor access and limited information dissemination, continue to hinder EC uptake among young women in Nigeria (Akorede et al., 2022).

Awareness of emergency contraceptives is crucial for their effective utilization. Studies show that awareness is significantly linked to education, exposure to health information, and cultural acceptance (Kumar et al., 2024; Mesfin, 2020). University students, particularly females, are at an age where sexual activity may increase, and therefore, they need access to accurate, age-appropriate reproductive health information. However, many students remain unaware or misinformed about ECs, their timing, and potential side effects. Furthermore, sociocultural norms and stigma discourage open discussions about contraception among unmarried women, leaving many in ignorance or fear of judgment (Nmadu et al., 2024). The need for health education intervention to improve awareness of emergency contraceptives cannot be overemphasized. Health education equips individuals with factual information, corrects misconceptions, and promotes positive attitudes and behaviors regarding reproductive health. It has been widely recognized as a cost-effective strategy to empower women and reduce the incidence of unintended pregnancies (WHO, 2023). In university settings, health education programs tailored to students' needs have shown promising results in increasing contraceptive awareness and encouraging safe sexual practices. Previous studies have demonstrated the positive impact of health education interventions on awareness and attitudes toward emergency contraceptives. For example, Arinze-Onyia et al. (2010) found that after a structured health education session among female students in southwestern Nigeria, awareness scores increased significantly, and misconceptions declined. Similarly, Alhassan et al. (2025) reported a notable rise in the correct use of ECs among participants of a university-based health education campaign. These findings underscore the potential of targeted interventions in improving reproductive health outcomes among young women.

In Jigawa State, northern Nigeria, several challenges impede the awareness and use of emergency contraceptives among undergraduate female students. The region is characterized by conservative cultural and religious values that discourage open discussions about sexuality and contraceptive use. Many young women in universities face social pressure, misinformation, and limited access to reproductive health services. Moreover, reproductive health education is rarely integrated into school curricula or orientation programs, resulting in poor awareness. The researchers observed that a significant proportion of undergraduate female students in the state either do not know about ECs or harbor harmful myths that discourage their use. This lack of awareness makes them vulnerable to unintended pregnancies, unsafe abortions, and disruptions in their academic pursuits. Improving the awareness of emergency contraceptives among undergraduate female students is critical for advancing their reproductive health and academic success. Despite the availability and effectiveness of ECs, awareness remains low in many parts of Nigeria, including Jigawa State. Health education intervention programs provide a viable solution to this problem

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202565

by addressing awareness gaps, dispelling myths, and empowering young women with the information they need to make informed choices. This study, therefore, seeks to examine the effect of health education intervention programs on emergency contraceptives awareness among university undergraduate female students in Jigawa State, Nigeria.

Objectives of the study

1. The effect of health education intervention programs on emergency contraceptives awareness among university undergraduate female students in Jigawa State, Nigeria.
2. The mean difference on awareness of emergency contraceptives between university undergraduate female students exposed to health education intervention programs and those not exposed to the program in Jigawa State.

Research Questions

1. What is the mean response of health education intervention programs on emergency contraceptive awareness among university undergraduate female students in Jigawa State?
2. What is the mean difference on awareness of emergency contraceptives between university undergraduate female students exposed to health education intervention programs and those not exposed to the program in Jigawa State?

Hypotheses

H_{o1}: There is no significant mean response of Health Education intervention programs on Emergency Contraceptive Awareness among university undergraduate female students in Jigawa State.

H_{o2}: There is no significant mean difference on awareness of emergency contraceptives between and university undergraduate female students exposed to health education intervention programs and those not exposed to the program in Jigawa State.

Methodology

The study adopted a quasi-experimental research design of pre-test and post-test approach. This design was considered appropriate because participants are randomly assigned to either the treatment or control (no-treatment) group, and are measured or tested both before and after the experimental treatment is implemented. The study comprised two groups: an experimental group (Group A) and a control group (Group B). Both groups were subjected to a pre-test using the Questionnaire before the intervention. The experimental group received a six-week health education intervention program, while the control group received no such intervention. After the intervention, both groups completed a post-test using the same questionnaire. The difference in average scores between the pre-and post-tests for each group was used to determine the effect of the intervention. The population of the study consisted of all university undergraduate female students in Jigawa State, Nigeria. The four Universities are Federal University Dutse, Dutse (4,811), Sule Lamido University, Kafin Hausa (1,097), Khadija University, Majia (579), and Federal University of Technology, Babura (297), which gives a total number of 6,784 university undergraduate female students in Jigawa State, Nigeria. According to Cohen, Manion and Morrison (2007), for experimental research, a sample size of Sixty (60) is considered adequate to give the expected outcome. The sample size was drawn out using simple random, proportionate, systematic and simple random sampling techniques. The researcher used a researcher-developed questionnaire and Health education manual as instruments for the study. The researcher's developed questionnaire was divided into two sections: Section A consisted of demographic information, and Section B featured items on awareness of emergency contraceptives. Responses were scored using a four-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). A mean score of 2.50 and above was interpreted as positive or accepted, while a score below 2.50 was considered negative or not accepted.

To ensure the instrument's validity, five experts in the Department of Human Kinetics and Health Education and the College of Medical Sciences at Ahmadu Bello University, Zaria, vetted the instrument. Their suggestions were incorporated into the final version used for data collection. A pilot study was also conducted at Khadija University, Majia to establish the reliability of the instrument, involving 30 female students similar to the study population. The resulting Cronbach's Alpha coefficient of 0.884 demonstrated high internal consistency and confirmed the reliability of the instrument. The researcher's Developed Health Education Manual was developed by the researcher to educate the students on emergency contraceptives during the intervention program. The study was conducted in three key phases. Phase I (pre-intervention) involved administering the baseline questionnaire. Phase II (intervention) entailed delivering the health education intervention program to the experimental group once weekly for six weeks, between 2:00 pm and 3:00 pm, in the university premises. The control group was not exposed to this intervention. Phase III (post-intervention) involved re-administering the questionnaire to all participants. The researchers, along with four instructed research assistants, visited the four universities in Jigawa State (Federal University Dutse, Sule Lamido University Kafin Hausa, Khadija University Majia and the Federal University of Technology, Babura) and submitted an introduction letter from the Department of Human Kinetics and Health Education at Ahmadu Bello University in Zaria, Nigeria, to the Dean of Student Affairs of each university to request authorization to carry out the study in the school.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202565

The data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 30. The research questions were answered using mean and standard deviation, while the postulated hypotheses were analysed using inferential statistics of the paired sample t-test and the independent sample t-test. All the hypotheses were tested at the 0.05 level of significance.

Presentation of Results

Research Question 1

What is the mean response of Health Education intervention programs on Emergency Contraceptive Awareness among university undergraduate female students in Jigawa State?

Table 1: Mean and Standard Deviation of Effect of Health Education Intervention on Awareness of Emergency Contraceptives among University Undergraduate Female in Jigawa State (N = 30).

Item	Mean	Std. Dev.	Mean Difference
Pretest	1.79	0.78	
			2.14
Post-test	3.93	0.79	

Source: Field Work (2025)

The data presented in Table 1 illustrate the effect of a health education intervention on emergency contraceptives awareness among university undergraduate female students in Jigawa State. The pretest mean score of 1.79 indicates a low level of awareness about emergency contraceptives prior to the intervention. Following the intervention, the post-test mean score increased substantially to 3.93, resulting in a mean difference of 2.14. This increase in mean scores confirmed that the health education intervention was effective in significantly enhancing the participants' awareness of emergency contraceptives.

Research Question 2

What is the mean difference on awareness of Emergency Contraceptives between university undergraduate female students exposed to Health Education intervention programs and those not exposed to the program in Jigawa State?

Table 2: Mean and Standard Deviation of the difference between experimental and control groups after health education intervention programs on awareness of emergency contraceptives among university undergraduate female students in Jigawa State

Item	N	Mean	Std. Dev.	Mean Difference
Control	30	1.65	0.63	
				2.28
Experiment	30	3.93	0.79	

Source: Field Work (2025)

Table 2 presents the comparison between the experimental and control groups after health education intervention programs aimed at improving awareness of emergency contraceptives among university undergraduate female students in Jigawa State. The data indicate that the experimental group (N = 30), which received the health education intervention, recorded a higher mean score of 3.93 on awareness of emergency contraceptives compared to the control group (N = 30), which recorded a much lower mean score of 1.65. This yields a mean difference of 2.28 in favour of the experimental group. The marked disparity in mean scores affirmed that the health education intervention had a strong and positive impact on the awareness levels of the participants in the experimental group. It implies that exposure to the intervention was effective in enhancing their understanding of emergency contraceptive methods, while the control group, which did not receive any structured educational input, maintained a low level of awareness.

Hypothesis 1

There is no significant mean response of Health Education intervention programs on Emergency Contraceptive Awareness among university undergraduate female students in Jigawa State.

Table 3: Paired Sample t-test representation of Pretest and Post-test of Emergency Contraceptives Awareness (N = 30)

Emergency contraceptives	Mean	Std. Dev.	Mean Difference	df	t-value	Sig.
Pretest	1.79	0.78				
			2.14	29	13.30	0.000
Post-test	3.93	0.79				

p cal. < 0.05, t cal, > 1.96 at df 29

Table 3 presents the results of a paired sample t-test comparing the pretest and post-test scores on awareness of emergency contraceptives among 30 university undergraduate female students in Jigawa State, following a health education intervention. The mean score before the intervention (pretest) was 1.79, while the mean score after the intervention (post-test) increased

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202565

markedly to 3.93, resulting in a mean difference of 2.14. The calculated t-value of 13.30 is significantly greater than the critical t-value of 1.96 at 29 degrees of freedom, and the corresponding p-value of 0.000 is well below the alpha level of 0.05, indicating a statistically significant difference between the pretest and post-test scores. With this, the null hypothesis, which states that there is no significant mean response of Health Education intervention programs on Emergency Contraceptive Awareness among university undergraduate female students in Jigawa State was rejected. This implies that the health education intervention had a significant positive effect on improving the participants' awareness of emergency contraceptives.

Hypothesis 2

There is no significant mean difference on awareness of Emergency Contraceptives between and university undergraduate female students exposed to Health Education intervention programs and those not exposed to the program in Jigawa State.

Table 4: Independent Sample t-test representation of the difference between experimental and control groups after health education intervention programs on awareness of emergency contraceptives

Emergency contraceptives	N	Mean	Std. Dev.	Mean Difference	df	t-value	Sig.
Control	30	1.65	0.63				
				2.28	58	14.88	0.000
Experimental	30	3.93	0.79				

p cal. < 0.05, t cal, > 1.96 at df 58

Table 4 presents the results of an independent sample t-test conducted to determine whether there is a significant difference in the awareness of emergency contraceptives between the experimental and control groups after health education intervention programs among university undergraduate female students in Jigawa State. The data shows that the experimental group, which received the health education intervention, had a higher mean awareness score (Mean = 3.93) compared to the control group (Mean = 1.65), with a mean difference of 2.28. The t-value calculated is 14.88 with 58 degrees of freedom (df), and the corresponding p-value is 0.000. Since the p-value is less than the 0.05 level of significance and the calculated t-value (14.88) exceeds the critical t-value of 1.96 at df = 58, the null hypothesis, which states that there is no significant mean difference on awareness of emergency contraceptives between and university undergraduate female students exposed to health education intervention programs and those not exposed to the program in Jigawa State was rejected. This indicates that the health education intervention had a statistically significant positive effect on improving the awareness of emergency contraceptives among the university undergraduate female students in the experimental group.

Discussion of Findings

The result of hypothesis one shows that awareness of emergency contraceptives has been improved with health education intervention, with a t-value of 13.30 was found to be greater than the t critical value of 1.96 at degree of freedom 29 and P<0.05. This shows that the hypothesis that states that there is no significant mean response of health education intervention programs on emergency contraceptive awareness among university undergraduate female students in Jigawa State is rejected. This implies that the gap in awareness of emergency contraceptives among university undergraduate female students in Jigawa State has been filled. This finding correlates with Abera et al. (2021), who identified a low level of awareness as one of the major predictors of utilization of emergency contraceptives among the respondents.

The study recommends that awareness creation through health education intervention should be focused on. Kaushal et al. (2014) reported that none of the respondents knew intrauterine devices as emergency contraceptives. Nevertheless, Barbian et al. (2021) revealed that emergency contraceptive usage is prevalent among female university students; however, several gaps in awareness still exist, and this demonstrates the importance of discussing this issue earlier and planning actions of an informative nature. Therefore, health education intervention is required to fill the awareness gap. The study of Mamuye et al. (2021) lies in between, which revealed that even though there is awareness of emergency contraception among the respondents, there is a gap concerning the correct time of use. Similarly, Williams et al. (2021) reported that the respondents were aware of emergency contraception; however, misunderstandings regarding emergency contraceptives were common, which reveals inadequate awareness. Therefore, educating adolescents on emergency contraceptives may improve their awareness of the respondents. Incompatibility with the result, Fekadu (2017) revealed that 95.9% of university students have heard about emergency contraceptives, which implies that awareness of emergency contraceptives among the respondents was high. In the same vein, Mishore et al. (2019) reveal that 70% of the study participants had good awareness of emergency contraceptives. Moreover, awareness was the only determining factor of the practice of EC. The study then concludes that female students of older age and higher educational status of parents had higher awareness and practice of EC.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202565

Hypothesis two revealed that there is a significant difference between experimental and control groups after health education intervention programs on awareness of emergency contraceptives among university undergraduate female students in Jigawa State. The finding aligns with and corroborates the results of several previous studies. For instance, Durosimi-Etti (2016) found that reproductive health education intervention significantly improved the awareness of contraceptive choices among undergraduate female students, which supports the current study's conclusion that health education interventions enhance awareness of emergency contraceptives. Similarly, Abdulrazaq et al. (2014) demonstrated that educational interventions led to a significant increase in family planning awareness among married women, further validating the current findings. The positive effect observed in the experimental group also resonates with Alemayehu et al. (2020), where community-based interventions, including health education, significantly improved family planning use and intentions.

Conversely, the findings of the current study oppose the results of Jimoh (2018), who reported that rural women in Kogi State did not exhibit a significant attitude or practice toward family planning despite having awareness. However, this discrepancy may stem from differences in study populations and contexts, as Jimoh's research focused on rural women rather than undergraduates. Additionally, the current study's results counter the observations of Olabode et al. (2015), where female students demonstrated poor awareness of emergency contraceptives. Yet, this disagreement can be attributed to the absence of an intervention in Olabode's study, whereas the current research employed a structured health education program, highlighting the critical role of health education interventions in improving awareness.

Conclusion

The study concludes that health education intervention effectively enhances the awareness of emergency contraceptives among university undergraduate female students in Jigawa State. Furthermore, the findings reveal a significant difference in the level of awareness between the experimental group, which received the intervention, and the control group, which did not, indicating the positive effect of the health education program.

Recommendations

Based on the conclusion, the following recommendations were made:

1. The university health educators and counsellors should regularly implement structured health education programs on emergency contraceptives for undergraduate female students.
2. The university management and relevant educational authorities should integrate reproductive health education, including emergency contraception, into the general orientation and curriculum for female students.

Acknowledgements

The researchers wish to appreciate the Jigawa State Ministry of Education and the management of Federal University Dutse, Sule Lamido University Kafin Hausa, Khadija University Majia and the Federal University of Technology, Babura.

References

Abdulrazaq, A. G., Kabir, S., Mohammad, N. S., & Suleiman, I. H. (2014). The effect of educational intervention on family planning knowledge, attitudes, and practices among married women in a military barracks in Northern Nigeria. *African Journal of Reproductive Health*, *18*(1), 93.

Abera, L., Sema, A., Guta, A., & Belay, Y. (2021). Emergency contraceptive utilization and associated factors among college students in Dire Dawa City, Eastern Ethiopia: A cross-sectional study. *European Journal of Midwifery*, *5*, 28. https://doi.org/10.18332/ejm/137655

Akorede, S. N., Akorede, A. A., Isiaq, A. T., & Yusuf, I. S. (2022). Influence of demographic characteristics on family planning adoption among females in Samaru, Kaduna State. *Kampala International University Interdisciplinary Journal of Social Science and Humanities, 3*(1), 1-12.

Alemayehu, M., Medhanyie, A. A., Reed, E., & Bezabih, A. M. (2020). Use of community-based intervention to promote family planning use among pastoralist women in Ethiopia: Cluster randomized controlled trial. *MedRxiv*.

Alhassan, M., Adjeso, Y. N., Yanbom, C. T., & Agomuo, S. K. S. (2025). Factors associated with the utilization of emergency contraceptives by Female College Students in Rural Ghana: A Cross-Sectional Study. *Health science reports*, *8*(3), e70575. https://doi.org/10.1002/hsr2.70575

Arinze-Onyia, S. U., Onwasigwe, C. N., Uzochukwu, B. S. C., Nwobi, E. A., Ndu, A. C., & Nwobodo, E. (2010). The effects of health education on knowledge and attitudes to emergency contraception by female students of a tertiary educational institution in Enugu, South East Nigeria. *Nigerian Journal of Physiological Sciences*, *25*(December), 165–171.

Barbian, J., Kubo, C. Y., Balaguer, C. S., Klockner, J., da Costa, L. M. V., Ries, E. F., & Bayer, V. M. L. (2021). Emergency contraception in university students: Prevalence of use and knowledge gaps. *Revista de Saúde Pública*, *55*, 74. https://doi.org/10.11606/s1518-8787.2021055003076

Durosimi-Etti, H. T. (2018). *Effect of reproductive health education intervention on sexual health choices of University of Ilorin female students*. Unpublished project, University of Ilorin.

Fekadu, G. A., Omigbodun, A. O., Roberts, O. A., & Yalew, A. W. (2019). Factors associated with long-acting and permanent contraceptive methods use in Ethiopia. *Contraception and Reproductive Medicine*, *1*, 4. https://doi.org/10.1186/s40834-019-0091-3

Jimoh, M. (2018). *Assessment of knowledge, attitude and practice (KAP) of family planning among rural women in Kogi State, Nigeria*. Unpublished thesis. Ahmadu Bello University: Zaria, Nigeria.

Jonas, K., Duby, Z., Maruping, K., Harries, J., & Mathews, C. (2022). Rumours, myths, and misperceptions as barriers to contraceptive use among adolescent girls and young women in South Africa. *Frontiers in reproductive health*, *4*, 960089. https://doi.org/10.3389/frph.2022.960089

Kaushal, M., Maru, L., & Dave, A. (2014). Emergency contraceptive knowledge, attitudes and practices in women presenting to family planning outpatient clinic in central India. *Journal of South Asian Federation of Obstetrics and Gynaecology*, *6*(1), 21–24.

Kumar, R., Anwar, M., Naeem, N., Asim, M., Kumari, R., & Pongpanich, S. (2024). Effect of health education on knowledge, perception, and intended contraceptive use for family planning among university students in Pakistan. *Scientific Reports*, *14*(1), 1-7. https://doi.org/10.1038/s41598-024-79550-5

Kwame, K. A., Bain, L. E., Manu, E., & Tarkang, E. E. (2022). Use and awareness of emergency contraceptives among women of reproductive age in sub-Saharan Africa: A scoping review. *Contraception and Reproductive Medicine*, 7, 1. https://doi.org/10.1186/s40834-022-00167-y

Mamuye, S. A., Wudineh, G. K., Belay, A. N., & Gizachew, K. D. (2021). Assessment of knowledge, attitudes, and practices regarding emergency contraception methods among female Dangila Hidase High School students, Northwest Ethiopia, 2019. *Open Access Journal of Contraception*, *7*(12), 1–5. https://doi.org/10.2147/OAJC.S288029

Mesfin, D. (2020). Emergency contraceptive knowledge, utilization and associated factors among secondary school students in Wolkite town, southern Ethiopia: A cross-sectional study. *Contraception and Reproductive Medicine*, 5, 15. https://doi.org/10.1186/s40834-020-00119-4

Mishore, K. M., Woldemariam, A. D., & Huluka, S. A. (2019). Emergency contraceptives: Knowledge and practice towards its use among Ethiopian female college graduating students. *International Journal of Reproductive Medicine*, *2019*, 9397876. https://doi.org/10.1155/2019/9397876

National Demographic and Health Survey (NDHS). (2018). *Nigeria Demographic and Health Survey 2018*. Abuja, Nigeria: NPC and ICF.

National Population Commission (NPC). (2021). *Population and fertility estimates*. Abuja: NPC.

Nmadu, A. G., Musa, J., Joshua, I. A., Oyefabi, A. M., Usman, N. O., Nwankwo, B., & Dahiru, T. (2024). Attitudes and practices regarding contraception among male students in a Nigerian tertiary educational institution: a cross-sectional study. *Frontiers in reproductive health*, *6*, 1439900. https://doi.org/10.3389/frph.2024.1439900

Nwankwo, B., Mohammed, M. H., Usman, N. O., & Olorukooba, A. A. (2021). Knowledge, attitude, and practice of emergency contraception among students of a tertiary institution in Northwestern Nigeria. *Journal of Medical Basic Science Research*, 2(1), 13–28. https://doi.org/10.46912/jmbsr.22

Olabode, K. T., Bashir, A. M., & Hilary, Z. (2015). Emergency contraceptive use among female students at Ahmadu Bello University, Zaria, Kaduna State. *Online Journal of New Horizons in Education*, *5*(3), 1-10..

Osborne, A., Bangura, C., & Ahinkorah, B. O. (2024). Trends and inequalities in modern contraceptive use among women in Sierra Leone, 2008–2019. *Reproductive Health*, 21, 167. https://doi.org/10.1186/s12978-024-01900-3

Pillai, V. K., & Nagoshi, J. L. (2023). Unmet Family Planning Need Globally: A Clarion Call for Sharpening Current Research Frameworks. *Open access journal of contraception, 14*, 139–147. https://doi.org/10.2147/OAJC.S378042

Tohit, N. F. M., & Haque, M. (2024). Forbidden Conversations: A Comprehensive Exploration of Taboos in Sexual and Reproductive Health. *Cureus*, *16*(8), e66723. https://doi.org/10.7759/cureus.66723

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202565

Tsegaw, M., Mulat, B., & Shitu, K. (2022). Modern contraceptive utilization and associated factors among married women in Liberia: Evidence from the 2019 Liberia Demographic and Health Survey. *Open access journal of contraception*, *13*, 17–28. https://doi.org/10.2147/OAJC.S350117

Williams, B. N., Jauk, V. C., Szychowski, J. M., & Arbuckle, J. L. (2021). Adolescent emergency contraception usage, knowledge, and perception. *Contraception*, *103*(5), 361–366. https://doi.org/10.1016/j.contraception.2021.01.004

World Health Organization (WHO). (2023). *Emergency contraception*. https://www.who.int/news-room/fact-sheets/detail/emergency-contraception

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202566

Assessment of Teachers' Perception of Artificial Intelligence Technology on Academic Achievement in Physics among Secondary Schools in Plateau State, Nigeria

FWANGLE, Ishaya Istifanus[1]
m.scpse220851@student.mau.edu.ng
+23480651158

MANKILIK, Mangut[2]
mankilikmangut@yahoo.com
+2348037054308

USMAN, Isa Shehu[2]
isau@unijos.edu.ng
+2348032751986

[1]Department of Physical Sciences Education, Modibbo Adama University Yola, Adamawa State, Nigeria.
[2]Department of Science and Technology Education, Faculty of Education, University of Jos, Plateau State, Nigeria.

Abstract
This study investigated the teachers' perception of artificial intelligence technology on academic achievement in physics among secondary schools in Plateau State, Nigeria. Guided by two objectives and two hypotheses respectively, grounded in Bento's AI Literacy Framework of 2020, the study explored teachers' perceptions of AI and examined whether gender differences influenced their effectiveness in utilizing AI to enhance learning outcomes. Using an ex post facto research design, a sample of 36 Physics teachers and 393 SS3 students were selected across 36 secondary schools during the 2024/2025 academic session in Plateau State. *Data were collected using the Physics Teachers' AI Literacy Assessment Questionnaire (PTAILAQ) and a Physics Students' Academic Achievement Proforma (PSAAP). Descriptive statistics of mean and standard deviation was used to answer the research questions and inferential analyses of ANOVA & ANCOVA were used to test the two hypotheses at a 0.05 level of significance. Results revealed that teachers exhibited a high level of perception of AI as a useful tool for improving students learning. However, no significant effect was found between teachers' AI perception and students' academic achievement. The study concludes that while teacher's perception of AI is high, it does not directly translate to improved academic outcomes. Recommendations included targeted AI training, infrastructural support, and policy reforms to bridge the gap between perception and classroom practice.*
Key Words: *Physics teachers AI perception, Plateau State, Academic achievement.*

Introduction
The integration of Artificial Intelligence (AI) in education has transformed the way teaching and learning occur. In physics teaching and learning, AI can enhance understanding and academic achievement by providing interactive simulations, personalized learning experiences, and real-time feedback (Kim & Lee, 2020; Spector, 2016). However, the effectiveness of AI integration largely depends on teachers' literacy levels in AI. Since the early 21st century, artificial intelligence (AI) has made remarkable strides, becoming a transformative force across various facets of society. In education, a significant and emerging area of AI research has evolved, viewing AI not merely as a tool, but as an integral component of the learning process. This paradigm shift has introduced the concept of AI literacy (Mertala et al. 2022), which extends beyond the confines of traditional education. AI literacy is defined as "a set of competencies that enable individuals to critically evaluate AI technologies, communicate and collaborate effectively with AI, and use AI as a tool online, at home, and in the workplace" (Long & Magerko, 2020). To adequately prepare teachers and students for an AI-driven world, it is essential to offer AI learning opportunities that equip them with the requisite knowledge and skills, thereby fostering the development of AI literacy (Mertala et al., 2022). The advent of AI in education has opened new avenues for enhancing teaching and learning processes (Mertala et al., 2022). AI literacy among educators is crucial for leveraging these technologies effectively (Mertala et al., 2022). Physics, being a subject that requires both theoretical understanding and practical application, can significantly benefit from AI integration (Mahligawati, et al. 2023). Despite its potential, there is a gap in understanding the teacher's perception of AI among physics teachers and the effect on students' academic achievement in Plateau State, Nigeria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202566

The academic achievement of students in physics remains a concern in many Nigerian secondary schools showing low performance in national examinations like the West African Examination Council (WAEC) and National Examination Council (NECO) (Mankilik & Umaru, 2015). While various factors contribute to this issue, the role of teachers' perception of AI tools as a valuable in education for influencing students' performance has not been adequately explored. This study aims to address this gap by examining the effect of physics teachers' artificial intelligence on students' academic achievement in senior secondary schools in Plateau State.

Purpose of the Study

The purpose of this study is to investigate the effect of teachers' perception of AI on students' academic achievement in physics in senior secondary schools, Plateau State, Nigeria. Specifically, the study seeks to:

(1). Determine the Physics teacher's perception of AI as a useful tool for improving student academic achievement is senior secondary schools in Plateau State.

(2) Evaluate the Physics teacher's perception based on gender in senior secondary schools in Plateau State.

Research Questions

The following questions guided the study.

1. To what extent do Physics teacher's perceive AI on improving students' academic achievement is senior secondary schools in Plateau State?
2. How does students' academic achievement in Physics relate to teachers' gender-based perception of AI on improving academic achievement in senior secondary schools in Plateau State?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance.

H_{01}. There is no significant effect of Physics teacher's perception of Artificial Intelligence (AI) on academic achievement is senior secondary schools in Plateau State.

H_{02}. There is no significant relationship between students' academic achievement in Physics and teachers' gender-based perception of AI on academic achievement senior secondary schools in Plateau State.

Literature Review

Based on the topic " Effect of Teachers Artificial Intelligence on Students' Academic Achievement in Physics in Senior Secondary Schools of Plateau State", the theoretical framework appropriate for this study is the Artificial Intelligence (AI) Literacy by Bento (2020) who proposes a framework for Artificial Intelligence (AI) literacy, emphasizing the importance of developing a comprehensive understanding of AI concepts, skills, and attitudes. The key components of AI Literacy Framework according to Bento are: (i). AI Knowledge: Understanding AI concepts, including machine learning, natural language processing, and computer vision. (ii). AI Skills: Developing skills in using AI-powered tools and technologies, such as programming languages, simulations, and data analysis software. (iii). AI Attitudes: Cultivating positive attitudes towards AI, including critical thinking, creativity, and ethical awareness. Bento's framework for AI literacy provides a comprehensive foundation for developing AI knowledge, skills, and attitudes. By integrating AI literacy into existing curricula, providing teacher training and support, and ensuring access to AI-powered tools and technologies, educators can prepare individuals for success in an increasingly AI-driven world. The importance of AI literacy are; AI literacy prepares individuals for future careers in an increasingly AI-driven workforce, AI literacy promotes critical thinking and problem-solving skills, essential for navigating complex AI-powered systems and AI literacy fosters ethical awareness and responsibility, crucial for ensuring AI systems are developed and used in ways that benefit society

.

Artificial Intelligence (AI) refers to the simulation of human intelligence processes by machines, particularly computer systems. In the context of education, AI comprises tools and systems designed to simulate intelligent behavior, automate administrative tasks, personalize instruction, and enhance learning experiences (Zhang & Lu, 2021). AI-powered applications such as intelligent tutoring systems, automated grading, personalized learning platforms, and predictive analytics have gained widespread adoption in various educational settings. In Physics education, AI plays a transformative role by providing interactive simulations, real-time feedback, and adaptive learning systems that align content with students' unique learning styles and cognitive abilities (Chen et al., 2020). These technologies not only enrich instruction but also address barriers such as large class sizes and lack of individualized support. AI literacy encompasses a set of knowledge, skills, and attitudes required to understand, evaluate, and use AI technologies effectively (Long & Magerko, 2020). Bento (2020) proposed a three-component framework for AI literacy: (i) AI Knowledge, which includes understanding core concepts such as machine learning, natural language processing, and data science; (ii) AI Skills, including the ability to use AI tools such as simulations

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202566

and analytics software; and (iii) AI Attitudes, such as ethical awareness and critical thinking about AI applications. Kong et al. (2021) further advanced the discourse by emphasizing four pillars of AI literacy: recognizing and understanding AI, using and applying AI, evaluating and creating AI, and understanding AI ethics. The growing integration of AI into everyday life necessitates that educators be AI-literate to guide students effectively in navigating an increasingly AI-driven world. Teacher perception is critical to the successful adoption and integration of AI tools in classroom settings. Teachers who perceive AI as useful and aligned with their pedagogical goals are more likely to integrate such tools into their teaching practice (Ng et al., 2021a). Haleem et al. (2022) argue that AI in education enhances not only learner engagement but also streamlines administrative tasks, enabling teachers to focus on more meaningful instructional tasks.

However, Zhao et al. (2022) caution that without adequate training and exposure, teachers may view AI with skepticism, potentially hindering its adoption. Thus, positive perception must be coupled with adequate institutional support and professional development to ensure effective use of AI in teaching and learning. Physics, being an abstract and conceptual subject, benefits significantly from the integration of AI. Visualization tools, virtual laboratories, and adaptive assessments help demystify complex theories and promote experiential learning. AI enables differentiated instruction, catering to students' unique needs, pacing, and readiness levels (Zhai et al. 2021). Lee et al. (2021) observed that integrating AI into high school Physics classrooms improved students' conceptual understanding and fostered a future-oriented mindset towards STEM careers. Moreover, AI-assisted instruction was shown to increase learner autonomy and confidence in navigating difficult content areas. Gender disparities in technology use and adoption have been widely studied. However, recent findings suggest that both male and female teachers can exhibit high AI literacy and efficacy if given equal training opportunities (Kong et al., 2023a). While some studies indicate subtle differences in how male and female educators perceive and apply AI tools often linked to their prior exposure or teaching, these differences are not always statistically significant (Su & Yang, 2023). In Plateau State, Nigerian contexts, societal and cultural expectations may influence gender roles in STEM education, including the use of digital tools. Nevertheless, efforts toward gender-equitable training and resource access are bridging these gaps, allowing for more uniform integration of AI in classrooms.

Academic achievement is influenced by numerous factors, including teacher competency, instructional strategies, and available technology. The integration of AI has the potential to significantly impact student outcomes by providing real-time feedback, personalized learning pathways, and intelligent diagnostics that help identify learning difficulties (Van Esch & Black, 2021). Sahu et al. (2022) highlighted that students exposed to AI-based instruction generally perform better due to increased engagement and tailored content. However, this depends largely on the teachers' ability to effectively implement AI in instruction. Therefore, a teacher's AI literacy becomes a key determinant in maximizing the benefits of AI in education. Empirical evidence on the relationship between teacher AI literacy and student academic achievement is emerging. Studies by Kong et al. (2023a) found that high school teachers trained in machine learning and deep learning concepts were more capable of designing AI-driven learning experiences that positively impacted student engagement and performance. Similarly, Su et al. (2023) evaluated an AI literacy program and observed that improved teacher understanding of AI led to higher creativity and academic engagement among learners. These studies reinforce the idea that teacher AI literacy is not only necessary for professional development but also essential for enhancing students' academic performance. The reviewed literature underscores the pivotal role of AI in transforming education, especially in science subjects like Physics. Teachers' AI literacy, encompassing knowledge, skills, and attitudes, significantly influences the effectiveness of AI integration in teaching. While teacher perceptions are generally positive, actual classroom application depends on institutional support, infrastructure, and training. Although gender-based differences in perception exist, they are not definitive predictors of academic outcomes. Ultimately, improving teacher AI literacy could bridge the gap between technology potential and student academic success.

Methodology

The study adopted an expos facto research design due to fact that the researchers did manipulate any variable of discourse. A sample of thirty-six Physics teachers from a target population of 311 with 22,985 students' from Senior Secondary Three (SSIII); A sample of thirty-six physics teachers; and 393 students offering Physics in senior secondary schools in Plateau State, Nigeria, this was drawn using Taro Yamane's formula (Yamane, 1967), through random sampling technique a total of thirty-six senior secondary schools who participated in the study. Data were collected using a Physics Teachers' Perception of AI Questionnaire (PTPAIQ) and Physics Students' Academic Achievement Proforma (PSAAP). The PTPAIQ had ten items with the following response modes Very High Extent (VHE) = 5 points, High Extent (HE) = 4 points, Moderate Extent (ME) = 3 points, Low Extent (LE) = 2 points and Very Low Extent (VLE) = 1 point. The instruments were trial tested after its validity by experts and yields Cronbach's Alpha value of r=0.83 which shows a good instrument. The PTPAIQ assessed teachers'

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202566

knowledge and perception of AI in teaching Physics. Statistical analysis was conducted using descriptive statistics with decision ruled by real limits of numbers and inferential statistics (ANOVA and ANCOVA) for hypotheses testing at 0.05 alpha with decision rule that when P<0.05 the null hypothesis is rejected and when P>0.05 then we do not reject the null hypothesis and conclude there is no significant relationship.

Presentation of Results

The results of the study were presented in tables and discussions as follows:

Research Question One: To what extent do Physics teacher's perceive AI on improving students' academic achievement is senior secondary schools in Plateau State?

Answering Research Question One:

Table 1: Responses from Extent Physics Teacher's Perceive AI as Useful Tool for Improving Students' Academic Achievement in Senior Secondary Schools in Plateau State

S/N	Statement: n=393	Mean	S.D	Remark
1.	I believe AI can enhance student interest in physics.	4.19	1.75	HE
2.	I believe AI can improve student learning outcomes in physics.	4.19	0.71	HE
3.	I perceive AI as a useful tool for supporting personalized learning.	4.06	0.75	HE
4.	I believe AI can help reduce the workload associated with grading assessment.	3.94	0.79	HE
5.	I believe AI can enhance student teamwork in physics.	4.08	0.77	HE
6.	I generally recognize the potential of AI to support teacher professional development.	4.19	0.67	HE
7.	I believe AI can improve student access to quality physics learning.	4.14	0.72	HE
8.	I perceive AI as a useful tool for addressing equity with inclusion issues.	3.97	0.74	HE
9.	I often see AI as a means to support student-centered learning instruction.	4.00	0.76	HE
10.	Perceived usefulness of AI in physics education is influenced by my prior experience with technology.	4.33	0.82	HE
	Grand total average	4.11	0.85	HE

Table 1 examines the perception of AI as a useful tool for enhancing students learning outcomes among the physics teachers. The overall mean score is 4.11 with a standard deviation of 0.85, indicating a High Extent (HE) of AI literacy level. All items reflect high extents perception of AI as important tool in education, such as Perceived usefulness of AI in physics education is influenced by my prior experience with technology (Mean = 4.33, S.D = 0.85. Other items, like I believe AI can help reduce the workload associated with grading assessment (Mean = 3.94, S.D = 0.79), I often see AI as a means to support student-centered learning instruction (Mean = 4.00, S.D = 0.76, and I perceive AI as a useful tool for addressing equity with inclusion issues. (Mean = 4.00, S.D = 0.74), all fall into the high-extent category. The overall result implies that physics teacher's perception of AI as a useful tool for improving student learning outcomes in physics is not an issue among Physics teachers in senior Secondary Schools in Plateau State.

Hypothesis One: There is no significant effect of Physics teacher's perception of Artificial Intelligence (AI) as a useful tool for improving student learning outcomes on academic achievement in senior secondary schools in Plateau State.

Testing Hypothesis One

Table 2: Summary of ANOVA from Physics Teacher's Perception of AI as Useful Tool for Improving Student Learning Outcomes on Academic Achievement in Senior Secondary Schools in Plateau State.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202566

Source		Type III Sum of Squares	Df	Mean Square	F	Sig.
1	Corrected model	915.140[a]	10	91.514	1.347	.231
	Intercept	377.956	1	377.956	5.562	.035
	Teacher's perception of AI	113.424	10	113.424	1.669	.354
	Error	1698.757	25	194.847	2.967	.103
	Total	85318.070	36	67.950		
	Corrected total	2613.896	36			

R. Square=0.350 (Adjusted R square=0.90)

Table 2 summarizes the results of an ANOVA-based on analysis conducted to determine effect of Physics teacher's perception of AI as a useful tool for improving student learning outcomes on academic achievement in physics. The results reveal that there is no significant effect on students' academic achievement in physics, F(1.669, p=0.35>0.05). Since the p-value (0.354) is higher than the alpha value of 0.05, the null hypothesis is not rejected.

Research Question Two: How does students' academic achievement in Physics relate to teachers' gender-based perception of AI on improving academic achievement in senior secondary schools in Plateau State?

Answering Research Question Two:

Table 3: Mean and Standard Deviation for Students' Academic Achievement in Physics According to Teachers' Gender-Based Perception of AI on Academic Achievement in Senior Secondary Schools in Plateau State.

Gender	N	Mean	S. D
Male	27	46.94	8.58
Female	9	50.90	8.51
Total	36	47.93	47.93

Table 3 reports the mean academic achievement score of students offering Physics in senior secondary schools in Plateau State based on their teachers' gender. With a sample size of 393 students, the mean academic achievement score is 46.94 and 50.90, with a standard deviation of 8.58 and 8.51 respectively. This suggests that on average, students' academic achievement in Physics is moderate for both students taught by male or female teachers, showing that gender and perception of AI as useful tool makes no difference in academic achievement but there is a considerable variation in their academic achievement extents. The standard deviation indicates a wide dispersion of scores around the mean, highlighting differences in students' individual academic achievement in Physics in Plateau State. Male teachers: ME = 46.94 (SD = 8.58), Female teachers: ME = 50.93 (SD = 8.51) This suggests difference between genders, confirming that gender may play a significantly impact academic outcomes.

Hypothesis Two: There is no significant interaction effect of Physics teachers' perception based on gender, of AI as a useful tool for improving student learning outcomes in senior secondary schools in Plateau State.

Testing Hypothesis Two

Table 4: Summary of ANCOVA from Physics Teacher's Perception Based on Gender, of AI as Useful Tool for Improving Student Learning Outcomes on Academic Achievement in Senior Secondary Schools in Plateau State.

Source		Type III Sum of Squares	Df	Mean Square	F	Sig.
1	Corrected model	942.820[a]	11	85.711	1.231	.320
	Intercept	346.777	1	346.777	4.980	.035
	Gender	27.681	1	27.681	0.398	.379
	Teachers perception of AI	103.8774	10	103.8774	1.492	.379
	Error	1671.076	24	69.628		
	Total	85318.070	36			
	Corrected Total	2613.896	36			

a. R. Square=0.361 (Adjusted R square=0.068)

Table 4 summarizes the results of an ANOVA-based on analysis conducted to determine effect of Physics teacher's perception based on gender, of AI as a useful tool for improving student learning outcomes on academic achievement in physics. The

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202566

results reveal that there is no significant effect on students' academic achievement in physics, F(1.492, p=0.38>0.05). Since the p-value (0.379) is higher than the alpha value of 0.05, the null hypothesis is not rejected.

Discussion of Findings

Findings from Table 1 indicates that Physics teachers hold a high level of positive perception toward AI as a valuable educational tool for improving student learning outcomes. With a grand mean score of 4.11 and consistent "High Extent" (HE) ratings across all ten indicators, it is evident that teachers recognize AI's potential to personalize learning, enhance student engagement, and reduce administrative workload. This result is aligned with Bento's (2020) AI Literacy Framework, which emphasizes the importance of developing educators' knowledge, skills, and attitudes toward AI integration. Moreover, this outcome aligns with prior studies (Zhai et al., 2021; Haleem et al., 2022), which confirm that teachers' attitudes are critical for adopting AI in classroom instruction. It also supports Kong et al. (2023a), who noted that AI literacy is increasingly necessary across all levels of education to prepare teachers for future classroom environments.

The results from Table 2 indicate no statistically significant effect of Physics teachers' perception of AI on student academic achievement in senior secondary schools in Plateau State ($F = 1.669$, $p = 0.354 > 0.05$). Thus, the null hypothesis is retained, suggesting that while teachers generally have a positive perception of AI, this perception does not directly or significantly influence student outcomes. This may be due to several factors, including inconsistent implementation of AI tools, lack of appropriate infrastructure, or limited professional training in effectively integrating AI technologies into instruction. It may also reflect a disconnect between teacher perception and practical classroom usage, highlighting the need for actionable strategies and support structures to translate positive perception into effective AI-enhanced teaching. From the results shown in Table 3, students taught by female Physics teachers scored higher on average (Mean = 50.90) than those taught by their male counterparts (Mean = 46.94). Although both results fall within a moderate performance range, the difference suggests a possible gender related influence in how AI is perceived and implemented in the classroom. However, this variation was not statistically significant according to hypothesis testing, meaning that gender alone does not create a significant impact on students' academic performance in Physics. This observation may reflect complex differences in teaching styles and other factors between genders, which could affect students' academic achievement in Physics. Nevertheless, as AI integration becomes more common, these differences may lessen as instructional strategies may become more standardized. According to the ANOVA results in Table 4, there is no statistically significant interaction effect between teachers' perception of AI based on gender and students' academic achievement in Physics in senior secondary schools in Plateau State ($F = 0.398$, $p = 0.379 > 0.05$). Therefore, the null hypothesis is not rejected. Although female teachers' students performed slightly better, the result implies that gender does not significantly moderate the relationship between AI perception and students' academic achievement in Physics In senior secondary schools in Plateau State. This supports the idea that gender neutrality exists in effective AI perception among educators, and both male and female teachers are capable of integrating AI in ways that promote student achievement provided they receive equal access to training and support.

Conclusion

The study on effect of teacher's perception of artificial intelligence on students' academic achievement in senior secondary schools, Plateau Nigeria concludes that while teacher's perception of AI is high, it does not directly translate to improved academic achievement.

Recommendations

The findings of this study have several implications for educational stakeholder

1. Despite positive perceptions of AI, the lack of significant impact on student achievement suggests that more robust training is needed to equip teachers not just with the right attitudes but also the skills to implement AI tools effectively in class instruction.
2. Education policymakers for senior secondary schools in Plateau State should consider integrating AI literacy into teacher education curricula and provide regular workshops for in-service teachers.
3. Both male and female teachers should be provided equal opportunities to learn and utilize AI tools, ensuring gender sensitive classroom benefits.
4. It is essential to translate positive teacher perception into concrete classroom practices by providing AI-based resources, monitoring, and instructional guidelines tailored for Physics education.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202566

References

Bento, M. (2020). Artificial intelligence literacy: A framework for educators. *Journal of Educational Computing Research, 58*(4), 419-435.

Chen L, Chen P, & Lin Z (2020) Artificial intelligence in education: a review. *Ieee Access 8:75264–75278. https://doi.org/10.1109/*ACCESS.2020.2988510

Haleem, A., Javaid, M., Qadri, M. A., Singh, R. P., Suman, R. (2022) Artificial intelligence (AI) applications for marketing: a literature-based study. *Int J Intell Netw 3:*119–132. https://doi.org/10.1016/j.ijin.2022.08.005

Kim, J., & Lee, Y. (2020). Artificial intelligence in education: A review of the literature. *Journal of Educational Computing Research, 62*(4), 419-437.

Kong, S.C, Cheung, W.M.Y, & Tsang O (2023a). Evaluating an artificial intelligence literacy programme for empowering and developing concepts, literacy and ethical awareness in senior secondary students. *Educ Inf Technol 28*:4703–4724. https://doi.org/10.1007/s10639-022-11408-7

Lee, I., Ali, S., Zhang, H., DiPaola, D., & Breazeal, C. (2021). Developing middle school students' AI literacy. *In Proceedings of the 52nd ACM Technical Symposium on Computer Science Education:* 191–197. https://doi.org/10.1145/3408877.3432513

Long, D., & Magerko B (2020). What is AI literacy? Competencies and design considerations. *In: Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems:* 1–16. https://doi.org/10.1145/3313831.3376727

Mahligawati, F., Allanas, E., Butarbutar, M. H., & Nordin, N. A. N (2023). Artificial intelligence in Physics Education: *A Comprehensive literature review Journal of Physics.: Conference. Series. 2596 012080. doi:10.1088*/1742-6596/2596/1/012080

Mankilik, M., & Umaru, M. G. (2015). Effects of hybrid active learning strategy on secondary school students' Understanding of Direct Current Electricity Concepts in Physics. *International Journal of Learning Teaching and Educational Research, 13*(2), 77-87.

Mertala P, Fagerlund J, Calderon O (2022). Finnish 5th and 6th grade students' pre instructional conceptions of artificial intelligence (AI) and their implications for AI literacy education. *Comput Educ Artif Intell 3:*100095. https://doi.org/10.1016/j.caeai.2022.100095

Ng DTK, Lee M, Tan RJY, Hu X, Downie JS, Chu SKW (2023a). A review of AI teaching and learning from 2000 to 2020. *Educ Inf Technol 28*(7), 8445–8501. https://doi.org/10.1007/s10639-022-11491-w

Ng D.T.K, Leung J.K.L, Chu K.W.S. &Qiao M. S. (2021a). AI literacy: definition, teaching, evaluation and ethical issues. *Proc Assoc Inf Sci Tech 58*(1), 504–509. https://doi.org/10.1002/pra2.487

Sahu A, Mishra J, Kushwaha N (2022). Artificial intelligence (AI) in drugs and pharmaceuticals. *Comb Chem High Throughput Screen 25*(11), 1818–1837. https://doi.org/10.2174/1386207325666211207153943

Spector, J. M. (2016). *Foundations of educational technology: Integrative approaches and interdisciplinary perspectives.* Routledge.

Su J, Ng DTK. & Chu SKW (2023). Artificial intelligence (AI) literacy in early childhood education: The challenges and opportunities. *Comput Educ Artif Intell 4*:100124. *https://doi.org/10.1016/*j.caeai.2023.100124

Su J, Yang W (2022). Artificial intelligence in early childhood education: a scoping review. Comput Educ Artif Intell 3:100049. https://doi.org/10.1016/j.caeai.2022.100049

Van Esch P, Black JS (2021). Artificial intelligence (AI): revolutionizing digital marketing. *Australas Mark J 29*(3), 199–203. https://doi.org/10.1177/18393349211037684

Xu, Y., Liu, X., Cao, X., Huang, C., Liu, E., Qian, S., Zhang, J. (2021). Artificial intelligence: A powerful paradigm for scientific research. *The Innovation, 2*(4), Article 100179

Zhai, X., Chu, X. Chai, C.S., Jong, M.S.Y., Istenic. A., Spector, M., Liu, J.B., Yuan, J., & Li, Y. (2021). A review of artificial intelligence (AI) in education from 2010 to 2020. *Complexity 2021:*8812542. https://doi.org/10.1155/2021/8812542

Zhao, L., Wu, X, Luo, H. (2022). Developing AI literacy for primary and middle school teachers in China: based on a structural equation modeling analysis. *Sustainability 14*(21):14549. https://doi.org/10.3390/su142114549

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202567

Effect of Polya's Problem-Solving Model on performance in Respiration Concept among Secondary School Students in Zamfara State, Nigeria

BABANGIDA, Aliyu Kaura[1]
Email: babangidaak@yahoo.com
Tel: +2348030722111

BASHIR, Suleiman[2]
Email: absuleimank@gmail.com
Tel: +2348060431859

[1]Department of Science Education, National Open University of Nigeria
[2]Department of Science Education, Federal University, Gusau, Zamfara State, Nigeria

Abstract
This study investigated the effect of *Polya's problem-solving model on performance in respiration concept among secondary school students in Zamfara state, Nigeria. Two (2) research questions with their corresponding null hypotheses guided the study which adopted the quasi-experimental of the pretest-posttest control group research design. The population was 72, 534 students in 189 public senior secondary schools in the state. Multi-stage sampling was used in selecting 387 SS2 students during the 2024/2025 academic session as the sample using four (4) intact classes. Cellular Respiration Performance Test (CRPT) was the instrument used for data collection. Test-retest was adopted in determining the reliability of the instrument using the Pearson Product-Moment Correlation (PPMC) statistics which yielded a coefficient (r) of 0.82. The data collected were analyzed using descriptive statistics (Mean and Standard Deviation) and inferential statistics (One-Way Analysis of Covariance) at $p \leq .05$ significant level. The findings revealed that: the mean academic performance scores of the experimental group was significantly greater than that of the control group. Also, there were no statistically significant gender differences in the mean academic performance scores of the male and female students when taught cellular respiration using the Polya's Problem-Solving Model (PPSM). Hence, it was recommended that teachers should be encouraged to adopt the PPSM through re-trainings, seminars and workshops. Also, curriculum planners and policy makers should incorporate the PPSM in curriculum designs and policies so that it could widely be used at all levels of education.*
Keyword: *Polya's Problem-Solving Model, Performance, Biology*

Introduction
Biology is the science that contributes to most of the major discoveries of 20th century and will continue to do so in the 21st century as emphasis moves towards understanding of biological approaches and more eco-friendly synthetic systems such as forensic, environmental, soil and water biology (Adekali, 2023). As a subject, biology has contributed tremendously to financial, physical and aesthetic benefits of mankind and to nation-building (Adekali, 2023). Despite the importance of biology, statistics of grades obtained by biology candidates in the West Africa Secondary School Certificate Examination (WASSCE) in 2019 have not been encouraging (WAEC Chief Examiner's Report, 2019). That is why biology is losing its might in academic performance of students in post-primary institutions (Ekineh & Otuturu, 2024). Biology is a wider branch of science with many branches like botany, zoology, microbiology, anatomy, physiology, genetics, biochemistry, cytology and cellular respiration.

Respiration is a biological concept which refers to the process by which complex food substances are broken down, in a stepwise series of reactions, in cells, to produce energy with carbon dioxide and water as waste products (Dam et al., 2019). Cellular or tissue respiration is the process by which cells convert glucose into energy in the form of adenosine triphosphates (ATP) which are molecular units for energy transfer in the body of organisms. Cellular respiration involves the chemical activities of the cells in which glucose is broken down by a series of reactions controlled by enzymes to release energy. It is very essential for the survival of living organisms, as it provides the energy needed to power cellular activities. Its main function is to synthesize biochemical energy (in the form of ATP) which is stored and used by all living cells for the various metabolic processes such as biosynthesis, locomotion, reproduction, nutrition, response, growth, excretion, gaseous exchange and transportation of molecules across membranes and so forth (Briggs et al., 2009 in Usman, 2021). Dam *et al. (*2019) explained the three main stages of cellular respiration: glycolysis, the citric acid cycle, and oxidative phosphorylation. Glycolysis is a process by which glucose is broken down into pyruvate in the cytosol, producing a small amount of ATP and NADH. Citric

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202567

acid cycle (Krebs cycle) is the process by which pyruvate is converted into acetyl-CoA, which enters the citric acid cycle. This stage produces more ATP, NADH, and FADH2 as byproducts. Oxidative phosphorylation refers to the process by which electrons from NADH and FADH2 are passed through the electron transport chain, generating a proton gradient. This gradient is used to produce ATP through the process of chemiosmosis. Cellular respiration which is the main concept in this study is so wide with varied abstract contents or ideas that could best be taught using student-centered instructions and models like the Polya's problem-solving model. Polya's problem-solving model (PPSM) is a teaching model developed by George Polya in 1945. It is a problem-solving framework consisting of four stages: (i) understanding the problem; (ii) devising a plan; carrying out the plan; and looking back. This model guides learners in structured problem-solving, fostering critical thinking, and logical reasoning. Schoenfeld (2014) outlined how to effectively use the PPSM in teaching and learning. According to him, to apply the model in the classroom, teachers should: present a problem or scenario; guide learners through each stage; encourage active thinking and reflection; facilitate collaboration and discussion; and adapt the model to suit various subjects and levels. Studies and research findings in the use of PPSM in teaching learning processes show that the model enhances students' problem-solving skills (Schoenfeld, 2014). It improves critical thinking and logical reasoning (Nissenson et al., 2020). It develops mathematical literacy and supports science, technology, engineering and mathematics (STEM) education (Watson *et. al.*, 2020). It also fosters collaborative learning among diverse students (Kozma, 2019). Therefore, when effectively adopted by biology teachers in the class for teaching abstract and confusing biological concepts like cellular respiration, genetics and cell division, PPSM can significantly improve students' understanding and overall performance.

Performance refers to the measurement of academic achievement, progress, and accomplishment of students, teachers, and educational institution. Academic performance refers to how well a student performs in his/her educational pursuits. According to Obiakor et al. (2020), academic performance reflects a student's ability to understand and apply the knowledge, skills, and concepts taught in educational institutions. It may be used to refer to an expression used to present students' scholastic standing (Inekwe, 2002 in Salami, 2023). It is affected by many factors such as retention, student ability, the quality of secondary education received and teaching method (Usman, 2010 in Gachi, 2024). It has been observed (Nda, 2023) that the problem of students' under-performance in secondary schools in Nigeria has been a much-discussed educational issue. In solving any problem however, it is pertinent to understand the causes of such problems. Nda added that many causes or agents have been studied as the etiological starting point for investigating the phenomena of school failure or success. Olorundare (2014) in Oladehinde (2023) demonstrated that student's academic performance in senior secondary school certificate biology and other science subjects' examinations since eighties had remained poor. Adding that, a lot has been done to improve teaching of biology in secondary schools in Nigeria such as using different innovative teaching strategies, training and retraining of biology teachers, provision of laboratory equipment among others. In spite of that, students continue to perform poorly in biology. Oladehinde (2023) noted that this situation has created the need for more effective method and it then becomes necessary to explore the efficacy of alternative method of redressing this situation. Hence, this study intends to try PPSM to investigate its impacts on the students' understanding and overall academic performance. Gender could influence students' academic achievement in secondary school science subjects (Yuliskurnianati et al., 2019). It has been reported that there are sex differences in specific ability performance of students, that girls are better in spelling, writing and other knowledge. In contrast to this Okafor (2021) showed that females were not only under-represented but their levels of achievement in the fields of science and technology were low compared to the males'. Thus, the need to explore more on gender influence in education. That is why the researcher considers gender as one of the variables in the study.

Objectives of the Study

The aim of conducting this study was to investigate the Polya's problem-solving model on performance in respiration concept among secondary school students in Zamfara state, Nigeria. The specific objectives of the study were:

1. To find out the effect of Polya's problem-solving model on secondary school students' performance in respiration concept of biology; and
2. To determine the mean difference between male and female secondary school students' performance in respiration concept of biology when exposed to Polya's problem-solving model;

Research Questions

1. What is the mean difference in performance scores of students taught Respiration concept using Polya's model and those exposed to lecture method?
2. Is there any mean difference between male and female secondary school students' performance in respiration concept of biology when exposed to Polya's problem-solving model?

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202567

Hypotheses

Ho_1: There is no significant difference between the mean performance scores of students taught Respiration concept using Polya's model and those exposed to lecture method.

Ho_2: There is no statistically significant gender difference in secondary school students' performance in respiration concept of biology when exposed to Polya's problem-solving model.

Methodology

The research design adopted in the study was the pretest, posttest and post-posttest non-equivalent control group Quasi-Experimental design. The design was suitable for the study because: it was not possible to conduct true experimental research due to lack of randomization of the groups; intact classes were used; and to avoid disruptions of the students' natural classroom settings in the schools. The design involves two groups (experimental and control). The total population of the study consisted of all the 72, 534 senior secondary school students for the 2024/2025 academic session in all the 189 public senior secondary schools in Zamfara state while the target population was all the 27,253 SS2 students (17, 132 males and 10,121 females). Multi-stage sampling technique was used in selecting the study's sample. In the first stage, simple random sampling by balloting was used to select one (1) educational zone out of the four educational zones in the state. This was Gusau educational zone. In the second stage, one (1) local government area was selected using simple random sampling by balloting from the selected educational zone. This was Gusau local government area. In the third stage, stratified-random sampling (based on gender) was used to select four (4) public senior secondary schools (two male and two female schools) in the selected local government. An intact class from each of the four (4) selected schools was finally selected using simple random sampling by balloting and assigned as experimental and control groups for the study. Hence, each group contained two intact classes (a male and a female class). These four (4) intact classes formed the study's sample size of 387 students. The techniques were appropriate for the study due to the facts that they are scientific and provide equal opportunities for all subjects and ensure objective selections with adequate number of subjects selected from the population. Also, the study involved gender as one of its variables and that the public senior secondary schools in the study area are all single-sex. The data collection instrument used in this study was Cellular Respiration Performance Test (CRPT). The CRPT was adapted from standardized WAEC (SSCE) question papers (2014-2024). It contained thirty (30) multiple choice questions (MCQs) in objective forms with four responses (options A–D) of which one was the correct answer while the remaining four were wrong answers. The CRPT was based on the revised Blooms' taxonomy of educational objectives Usman (2021). The CRPT was administered to the respondents during the pre-test, post-test and post-posttest and was answered within 30 minutes with the aim of testing their academic performance in the concept before the treatment and to determine the effect of the treatment respectively. The research instrument used in this study was validated by three (3) experts: two (2) from the Department of Science Education, Federal University Gusau, Zamfara state, Nigeria while the other one (1) was a secondary school biology teacher with ten (10) years teaching experience. The reliability of the CRPT was established by a pilot study carried out in Namoda Secondary School, Kaura Namoda which was part of the study area but not among the sample schools in the area through test-retest method. The two sets of scores obtained were correlated using the statistical tool of Pearson Product Moment Correlation (PPMC) to determine the reliability index of the CRPT as 0.82. The researcher used the two different methods (PPSM and CM) in teaching the two different groups the concept of cellular respiration for a period of four (4) weeks for both the experimental and control groups respectively during the normal biology periods in the sampled schools. Students in the experimental group were taught concept of cellular respiration with PPSM, adhering strictly to the steps specified in its lesson plans for four (4) weeks. The data collected in the study were analyzed using descriptive (Mean and Standard Deviation) and inferential (One-Way Analysis of Covariance (ANCOVA)) statistical tools. Specifically, all the research questions and the null hypotheses were restated whereby the research questions were answered using mean and standard deviation and all the hypotheses were tested using One-Way ANCOVA and z-test at $p \leq .05$ level of significance. ANCOVA was appropriate for the hypotheses testing due the presence of covariate (the pretest) in the study.

Presentation of Results

Research Question 1

What is the mean difference in performance scores of students taught Respiration concept using Polya's model and those exposed to lecture method? This research question was answered using mean and standard deviation as shown in Table 1.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202567

Table 1: Summary of the Result of Students' Posttest Scores Means and Standard Deviations in both Experimental and Control Groups

Group	N	Mean ($\bar{X}$)	SD	MD	Remarks
Experimental	199	17.26	3.72	6.09	Difference Exists
Control	188	11.17	1.98		
Total	**387**				

Source: Author's Fieldwork 2024

Table 1 showed that the posttest mean scores and standard deviation of the experimental group were 17.26 and 3.72 respectively while those of the control group were 11.17 and 1.98 respectively. Hence, the mean difference between the groups was 6.09 and this result clearly indicated that the students taught using Polya's problem-solving model had higher mean performance score than those taught using the conventional method. That is, the experimental group performed better than the control group. However, by their respective standard deviations, the students' scores in the control group were more closely around the mean compared to those of the experimental group.

Research Question 2

Is there any mean difference between male and female secondary school students' performance in respiration concept of biology when exposed to Polya's problem-solving model? This research question was answered using mean and standard deviation and the result is presented in Table 2.

Table 2: Summary of the Result of Students' Posttest Scores Means and Standard Deviations in the Experimental Group by Gender

Gender	N	Mean ($\bar{X}$)	SD	MD	Remarks
Males	107	15.35	2.57	0.86	Difference Exists
Females	92	16.21	2.27		
Total	**199**				

Source: Author's Fieldwork 2024

Table 3 showed that the posttest scores means and standard deviations of male students in the experimental group were 15.35 and 2.57 respectively while those of the female students were 16.21 and 2.27 respectively. Hence, the mean difference between the male and female students' performance scores was 0.86. Likewise, in terms of standard deviations, the scores of the female students were more closely around the mean compared to those of the male students.

Hypothesis 1

There is no significant difference between the mean performance scores of students taught Respiration concept using Polya's model and those exposed to lecture method. This null hypothesis was tested with One-Way ANCOVA at $p \leq .05$ alpha level using the pretest as covariate as shown in Table 3.

Table 3: Summary of One-Way Analysis of Covariance (ANCOVA) of Students' Academic Performance Scores in CRPT

Source	Sum of Squares	DF	Mean Squares	F	Sig.	Decision
Corrected Model	15245.594	4	3811.398	30.777*	.000	
Intercept	45302.745	1	45302..745	365.815*	.000	
Pre-test	31.0 12	1	31.012	0.250	.618	Not Sign.
Inst. Strategy	14469.023	1	14469.023	116.836*	.000	Sign.
Error	13993.974	113	123.840			
Total	424685.000	118				
Corrected Total	29239.568	117				

Source: Author's Fieldwork 2024 * Significant ($P < 0.05$)

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202567

Table 3 revealed that Polya's problem-solving model has statistically significant effect on students' academic performance in the cellular respiration contents studied. This is because as seen from the table, the instructional strategy is statistically significant at *P*-value of .000 and therefore it is also statistically significant at a higher *P*-value of .05. This led to the rejection of the null hypothesis that Polya's problem-solving model has no statistically significant effect on secondary school students' performance in respiration concept of biology. Thus, there is a statistically significant difference between the mean academic performance scores of secondary school students taught cellular respiration concepts using Polya's problem-solving model and those taught using conventional method of teaching in favour of the experimental group ($F = 116.836$*, df = 1 and $p = .000 < .05$).

Hypothesis 2

There is no statistically significant gender difference in secondary school students' performance in respiration concept of biology when exposed to Polya's problem-solving model. This null hypothesis, One-Way ANCOVA at $p \leq .05$ level of significance was used and the result is displayed in Table 4.

Table 4: Summary of One-Way Analysis of Covariance (ANCOVA) of Students' Academic Performance Scores in CRPT by Gender

Source	Sum of Squares	DF	Mean Squares	F	Sig.	Decision
Corrected Model	15245.594	4	3811.398	30.777*	.000	
Intercept	45302.745	1	45302..745	365.815*	.000	
Pre-test	31.0 12	1	31.012	0.250	.618	Not Sign.
Gender	260.389	1	260.389	2.103	.150	Not Sign.
Error	13993.974	113	123.840			
Total	424685.000	118				
Corrected Total	29239.568	117				

Source: Author's Fieldwork 2024 * Significant ($P < 0.05$)

Table 4 revealed that the computed *F*-ratio for the effect of gender on academic performance of students in the cellular respiration concept taught was 2.103 which is not statistically significant at *P*-value of .05. Hence, the null hypothesis which states that there is no statistically significant gender difference in secondary school students' performance in respiration concept of biology when exposed to Polya's problem-solving model was accepted being that the derived significant level is greater than the *p*-value (F-ratio = 2.103, df = 1 and $p = .150 > .05$). Therefore, there is no statistically significant gender difference in the mean academic performance scores of the secondary school students when taught cellular respiration concept using the Polya's problem-solving model. Hence, it is a gender-friendly teaching strategy.

Discussion of Findings

This study investigated the effect of Polya's problem-solving model on secondary school students' performance and retention in respiration concept of biology in Zamfara state, Nigeria where four research questions and four research hypotheses were respectively answered and tested to obtain these results as the main findings discussed here. The findings revealed that there was difference between the mean academic performance scores of the students taught cellular respiration using the PPSM and those taught using the conventional method in favour of those taught using the PPSM and the difference was statistically significant. This was indicated by the groups' mean difference and the result of the one-way ANCOVA analysis on the mean academic performance scores of the secondary school students taught using the PPSM in learning cellular respiration and those taught using the conventional method. This implies that exposing students to the PPSM as an instructional strategy helps students learn and comprehend even the erroneously misconceived cellular respiration concept more easily than using the conventional method. This could simply be attributed to the PPSM intervention in the study. This finding is in line with the findings of Abuh *et. al*. (2024), Ekineh and Otuturu (2024) and Salami (2023). On gender and academic performance, the findings revealed also that there was no statistically significant difference in the mean academic performance in cellular respiration between male and female students exposed to the PPSM in learning cellular respiration. This was shown by their respective mean academic performance and the result of the one-way ANCOVA analysis on the academic performance scores of the male and female students taught using PPSM. Thus, the strategy is generally found to be gender-friendly and very suitable for both male and female students with varying intellectual abilities, learning styles and interests. This is owing to the fact that the strategy gives room for all students to actively participate and engage in the lesson irrespective of their gender. This finding is in line with the findings of Abuh et. al. (2024), Adekali (2023) and Usman (2021) who reported similar results in their

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202567

respective studies. However, Ekineh and Otuturu (2024) Odagboyi (2015) contradicted the above findings when they all revealed that boys achieved significantly higher than girls in their various findings. The findings of the study also revealed that students taught using PPSM had higher retention ability in cellular respiration than those students taught using conventional method. This indicated that the positive effect of PPSM is not only on academic performance of students but also on their retention abilities. This can be attributed to the fact that PPSM is a student-centred teaching model which paves way for the students to best grasp the ways solutions to various problems are arrived at through the problem-solving activities during the instruction. This finding is in line with the findings of Usman (2019).

Conclusion

In accordance with the findings of the study, the following conclusions were drawn:

1. PPSM significantly improves students' academic performance in learning cellular respiration concept as indicated by the statistically significant mean difference between the students in the experimental and control groups.
2. PPSM could generally be regarded as gender-friendly teaching strategy suitable for teaching both sexes as the mean difference between male and female students in the experimental group was not statistically significant.

Recommendations

By the objectives and findings of this study, the researcher recommended that:-

1. Teachers should be encouraged to adopt the PPSM through re-trainings, seminars and workshops as it greatly improves students' academic performance.
2. Stakeholders (governments, professional bodies and school administrators) should encourage biology and other science teachers to use PPSM in teaching all categories of students being it gender-friendly. This could be done right from the teacher training institutions and in-service programs and team-teaching.

Acknowledgements

The authors wish to duly acknowledge and express utmost gratitude and indebtedness to Adamu Usman Ph.D. student in the Department of Science Education Federal University Gusau, Dr. Nuhu Lawal Ishaq and Dr. Akilu Isma'il of the Federal University Gusau, Haruna Marafa of the National Open University of Nigeria, the Independent National Electoral Commission (INEC) and of course family members for their unwavering assistance, support, guidance, prayers, understanding and patience throughout the work.

References

Abuh, Y. P., Attah, N. A. & Timothy, I. (2024). Effects of two teaching strategies on students' academic achievement in science and technology education in Kogi state, Nigeria. *Journal of Science, Technology & Mathematics Pedagogy, 2(1),* 44-52.

Adekali, N. S. (2023). Effect of advance organizer on students' achievement in secondary school biology in Dekina local government area of Kogi state. *Journal of Science, Technology and Mathematics Pedagogy, 1(1),* 217-226.

Dam, M., Ottenhof, K., Boxtel, C. V & Janssen, F. (2019). Understanding cellular respiration through simulation using lego® as a concrete dynamic model. *Journal of Education Sciences, 9(7),* 1-21.

Ekineh, D. & Otuturu, F. G. (2024). Effect of real object on academic performance of biology students in secondary schools in Emuoha local government area, Rivers state. *Journal of Science, Technology & Mathematics Pedagogy, 1(2),* 87-94.

Gachi, J. A. (2024). Effect of computer-assisted instruction on students' academic performance and retention in chemistry concepts. *Journal of Science, Technology & Mathematics Pedagogy, 2(1),* 64-73.

Isma'il, A. & Matazu, S. S. (2024). Identification of perceived difficult topics in senior secondary school biology curriculum in Zamfara state.*Global Academic Journal of Humanities and Social Sciences, 6(1),* 22-30. https//doi:10.36348/gajhss.2024.v06i01.004

Matazu, S. S. & Ismail, A. (2023). Effect of flipped classroom instruction and enhanced lecture method on academic performance in genetics among students with visual-auditory-kinesthetic (VAK) learning styles in Gusau, Zamfara state, Nigeria. *Journal of Science, Technology and Mathematics Pedagogy (special edition)*, *1(2),* 1-20.

Nda, A. A. (2023). Assessment of e-learning practices among public secondary school chemistry students in Bosso local government area of Niger state, Nigeria. *Journal of Science, Technology and Mathematics Pedagogy, 1(1),* 37-49.

Nissenson, J., Williams, R. L., Oliver, R. & Moskal, P. D. (2020). Virtual reality in STEM education: A systematic review. *Journal of Science Education and Technology*, *29(3),* 439-453.

Okafor, N. P. (2021). Enhancing science process skills acquisition in chemistry among secondary school students. *Journal of Physics Conference Series, 1(2),* 57-70.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202567

Oladehinde, A. A. (2023). Effect of inquiry method on students' academic achievement in biology at senior secondary school in IdahKogi state.*Journal of Science, Technology and Mathematics Pedagogy, 1(1),* 30-36.

Piwuna, C. N. & Mankilik, M. (2023). The effect of the implementation of WAEC and NECO chief examiners' reports on senior secondary II biology students' motivation in Jos South, Plateau state, Nigeria.*Educational Research and Policy Journal, 9(2),* 62-71.

Salami, D. (2023). Adapting virtual learning: its impact on the performance among colleges of education mathematics students in North-Central Nigeria. *Journal of Science, Technology and Mathematics Pedagogy, 1(1),* 200-208.

Segun, A. G. & Akanbi, A. A. (2023). Effect of two instructional strategies on students' science process skills in some selected abstract concepts in biology in Kwara state, Nigeria. *Journal of Science and Technology, 1(1),* 98-112.

Usman, A. (2021). *Effects of multiple intelligence-based instructional strategy on secondary school students' academic achievement and motivation in cellular respiration in Gusau, Zamfara state-Nigeria.* Unpublished Master's Dissertation. Department of Science and Technology Education. Bayero University, Kano, Nigeria.

West African Examinations Council. (2024). *Chief examiners' reports (2019 to 2023).* E-learning Online. Retrieved on 16th October, 2024. Available at: https://www.waeconline.org.ng/e-learning/Biology/Biomain.html

Yuliskurnianati, I. D., Noviyanti, N.I., Mukti, W. R., Mahanal, S., & Zubaidah, S. (2019). Science process skills based on genders of high school students. International seminar on bioscience and biological education. *Journal of Physics Conference Series, 1(2),* 41-56.

Zamfara State Ministry of Education, *Science & Technology. (2024). Biology students' performance in WAEC SSCE 2015 to 2024.* Gusau. J.B Secretariat.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202568

Impact of Augmented-Reality Strategy on Engagement and Performance in Cell Biology Concepts among Secondary School Students in Sokoto State, Nigeria

ABDULRAHMAN, Abdullahi Aliyu[1]
abdullahiabdulrahman216@gmail.com
07064862721

IBRAHIM, Nasiru Tambuwal[1]
nasiru.tambuwal@ssu.edu.ng
08036084320

BELLO, Shamsudeen[1]
shamsudeen.bello@ssu.edu.ng
08032890327

ALIYU, Faruk[1]
faruk.aliyu@ssu.edu.ng
08031117032

[1]Department of Science Education, Sokoto State University

Abstract
This study examines the impact of Augmented-Reality strategy on engagement and performance in cell biology concepts among secondary school students in Sokoto state, Nigeria. Utilizing a quasi-experimental design with pre-test and post-test assessments, the research involved a sample size of 105 (53 male and 52 female) senior secondary two (SS II) students during the 2024/2025 academic session in Sokoto state were selected from the target population using multi-stage sampling technique. The intervention group experienced AR-based teaching methods, while the control group received traditional instruction. Data collection instruments included academic performance tests, student surveys on learning perceptions, and teacher observations of classroom engagement with validity/reliability indexes of 1/0.86 and 0.85/0.82 respectively. Quantitative analysis done using independent sample t-test revealed no significant gender differences in academic performance post-intervention; both male and female students showed marked improvement. However, qualitative findings indicated that female students exhibited higher engagement levels, actively participating in discussions and demonstrating greater interest in the content. In contrast, male students displayed mixed reactions, with some appreciating the AR's novelty, while others preferred more hands-on activities with immediate rewards. The study concludes that AR-based teaching methods can enhance academic performance for both genders, but engagement strategies may need to be tailored to address gender-specific preferences. Recommendations include adopting interactive teaching methods and promoting gender-sensitive strategies to foster equal engagement and achievement in biology education. Future research should explore the long-term effects of AR on gender-specific learning outcomes and examine whether integrating collaborative or gamified elements could further enhance engagement across diverse student groups.

Keywords: Augmented-reality, engagement. Gender, academic performance

Introduction
Gender differences in educational outcomes, particularly in science education, have long been a subject of interest for researchers and educators alike. Biology, being a critical component of science education, has traditionally been perceived as a subject where female students tend to outperform their male counterparts. However, this perception has evolved over time, as recent studies have shown that the gender gap in biology performance is not solely determined by gender but by a complex interaction of factors such as teaching methods, student engagement, and societal influences (Baker & Leary, 2021). In secondary school biology, these gender-based differences in performance and engagement may significantly influence how teachers approach instruction, with the goal of ensuring equal academic opportunities for all students. The educational environment, including the availability of resources and the strategies employed by teachers, also plays a pivotal role in shaping student achievement and interest in the subject (Mahoney, 2020; Roberts & Taylor, 2019). In the Nigerian educational system,

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202568

senior secondary school education represents a critical phase in a student's academic journey. It marks the transition from foundational knowledge to more specialized subjects, including biology, which is essential for students pursuing careers in health sciences, agriculture, and environmental studies (Afolabi & Ogunyemi, 2020). Biology education in Nigeria is designed to provide students with the knowledge and skills required to understand the natural world, with a particular focus on concepts such as cell biology, genetics, and ecology. Despite its significance, the delivery of biology education in many Nigerian states, including Sokoto, has been constrained by traditional methods of teaching, which often fail to fully engage students (Musa, 2021). According to Musa (2021), in Sokoto State, the educational practices have remained largely conventional, with limited exploration of how gender differences influence learning outcomes in the sciences. The state, located in the northwestern region of Nigeria, faces challenges such as insufficient teaching resources, large class sizes, and limited access to modern educational technologies (Ezeani, Nnadi, & Odili, 2021). However, the incorporation of innovative teaching strategies, such as AR, offers a promising approach to enhance student engagement and understanding in biology (Smith & Taylor, 2022). AR has the potential to bring abstract biological concepts to life, providing immersive, interactive experiences that could help bridge the gender gap in academic performance by engaging both male and female students equally (Anderson, Smith, & Taylor, 2021). This study, therefore, aims to examine gender-based differences in learning outcomes in cell biology, with a focus on how the use of AR in biology classrooms in Sokoto State may impact secondary school students' academic performance and engagement.

This study investigates gender differences in learning outcomes in biology, specifically focusing on cell biology, and the potential role of AR-based teaching interventions. Previous research has highlighted that male and female students engage with biology education differently due to factors such as learning preferences, engagement levels, and teaching methodologies (Halim & Meerah, 2015; Dufresne, Gerace, & Leonard, 2002). Gender disparities in academic performance can be influenced by motivation, confidence, and societal expectations regarding gender roles (Blickenstaff, 2005; Mahoney, 2020). This research explored whether AR-based interventions can help address or further amplify these gender-based differences in academic outcomes. AR has been identified as a tool that can enhance student engagement and understanding of complex biological concepts (Wu, Lee, Chang, & Liang, 2013), making it a potential solution to bridge gender gaps in biology education. Sokoto State, located in northwestern Nigeria, provides a unique educational and cultural context for this study. The state's educational system faces challenges such as inadequate infrastructure, limited access to modern resources, and a shortage of trained teachers, particularly in rural areas (Akinbobola, 2020). Additionally, gender roles and societal expectations are deeply embedded in the region's cultural fabric, influencing how students approach subjects like biology. In Sokoto, these societal norms may hinder female students' confidence and participation in science education, despite biology being traditionally seen as a female-dominated field globally (Mahoney, 2020). This study aims to determine whether AR interventions can help reduce gender disparities in student engagement and academic achievement in biology, particularly in the context of Sokoto's unique challenges.

Objectives of the Study

The main objectives of this study were to explore and quantify gender differences in learning outcomes in cell biology using AR strategy among secondary school students in Sokoto State. The study also identified the potential reasons behind these differences, which could inform future teaching strategies in Sokoto State and other similar contexts. The specific objectives of the study are:

1. To determine whether there is a significant gender difference in the academic performance of secondary school students in cell biology after an AR-based teaching intervention in Sokoto State, Nigeria.
2. Explore how male and female secondary school students perceive the learning of cell biology in Sokoto State, Nigeria.
3. To identify and examine the factors contributing to the observed gender differences in academic performance of secondary school students in cell biology in Sokoto State, Nigeria.

Research Questions

The following research questions guided the conduct of this study:

1. What is the mean difference in academic performance scores of male and female students taught cell Biology using Augmented Reality strategy in Sokoto State?
2. hat is the mean response in level of academic engagement of male and female students taught cell Biology using Augmented Reality strategy in Sokoto State?
3. What are the contributory factors affecting significant mean difference in academic performance scores of male and female students taught cell Biology using Augmented Reality strategy in Sokoto State?

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202568

Null Hypotheses:

Ho_1: There is no significant mean difference in academic performance scores of male and female students taught cell Biology using Augmented Reality strategy in Sokoto State

Ho_2: There is no significant mean response in level of academic engagement of male and female students taught cell Biology using Augmented Reality strategy in Sokoto State

Ho_3: There are no significant contributory factors affecting significant mean difference in academic performance scores of male and female students taught cell Biology using Augmented Reality strategy in Sokoto State

Literature Review

Gender and Education

Recent researches on gender differences in education indicates that female students often outperform male students in subjects like biology, with girls typically demonstrating stronger study habits, better classroom behaviors, and a focus on long-term academic success (Hyde, 2005; Baker & Leary, 2018). These differences, however, vary across cultural and geographical contexts, with factors such as access to resources, societal expectations, and educational interventions influencing these patterns (Buchmann, DiPrete, & McDaniel, 2008; Møller, 2020). The integration of modern pedagogical tools, like augmented reality (AR), has shown to impact student engagement and performance, but the effects may differ by gender (Valkenburg et al., 2020; Akpan, 2021). In regions like Sokoto State, Nigeria, where socio-cultural dynamics significantly influence education, examining these factors is crucial for developing interventions that promote gender equality and enhance academic outcomes in subjects like biology (Garcia & Gonzales, 2021).

Gender Differences in Science Education

In the context of science education, particularly biology, gender differences in academic performance are influenced by various factors, including teaching methods and learning preferences. Studies suggest that while boys often excel in hands-on, competitive activities, girls tend to outperform in subjects that require detailed study and memorization, such as biology (Baker & Leary, 2018). Research indicates that girls benefit from traditional, teacher-centered instruction, which provides structured guidance, while boys may struggle with this approach, preferring more interactive, rewarding learning environments (Smith & Jones, 2020). The use of digital tools like augmented reality (AR) is increasingly seen as a way to address these gender-based differences by providing engaging, interactive learning experiences that cater to diverse learning styles, potentially improving academic outcomes for both genders (Valkenburg, Kremers, & de Vries, 2020; Akpan, 2021). This highlights the need for tailored teaching strategies that consider the unique learning needs of both male and female students in biology education.

Theories of Gender in Learning

Recent studies on gender differences in biology education highlight how societal expectations and gender roles influence academic performance. Social role theory suggests that girls may excel in biology, a subject perceived as requiring precision and attention to detail, while boys tend to favor competitive or abstract subjects (Eagly & Wood, 2012). In contrast, stereotype threat theory explains that students may underperform when they are aware of negative gender stereotypes in academic settings, particularly in subjects like science (Steele & Aronson, 1995). While traditional gender differences have been observed, modern educational tools, such as augmented reality (AR), offer a promising solution by providing interactive and engaging learning experiences that can help reduce gender-based disparities in academic achievement (Valkenburg et al., 2020). This underscores the potential of AR to create a more equitable learning environment, especially in science education, by catering to diverse learning styles and challenging traditional gender biases.

Gender Differences in Nigerian Education

Recent studies within the Nigerian context highlight mixed results regarding gender differences in science education, with some indicating better performance by male students, while others show girls excelling, particularly in subjects like biology (Akanbi, 2016; Oloruntegbe, 2018). Gender roles and expectations, particularly in regions like Sokoto State, where traditional norms are deeply rooted, significantly influence students' attitudes towards learning and their academic performance in subjects such as biology. These gendered expectations often manifest in classroom behaviors, with girls sometimes exhibiting stronger organizational skills and a more consistent approach to studying, which can contribute to better performance in biology (Adesina & Olorundare, 2019). However, the increasing use of innovative teaching methods, such as augmented reality (AR), has the potential to mitigate these gender disparities by offering more engaging and interactive learning experiences that appeal to a wider range of learning preferences and help to overcome traditional gender biases (Gandhi et al., 2021). This underscores the need to further explore how new educational tools can help bridge the gender gap in science education, particularly in biology, in culturally diverse regions like Sokoto State.

Gender Differences in Cell Biology

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202568

Gender differences in biology, particularly cell biology, have been studied, revealing that females generally outperform males in subjects requiring memorization, detail, and attention, such as biology (Baker & Leary, 2018). This is linked to females' strengths in tasks that demand precision and sustained effort. Males, on the other hand, excel in more abstract or competitive subjects and may perform better in hands-on activities (Smith & Jones, 2020). Social role theory suggests that biology aligns with traditional gender roles, where girls are seen as more suited for subjects involving precision (Eagly & Wood, 2012). However, stereotype threat can negatively impact female students, causing underperformance when they are aware of stereotypes about their abilities in science (Steele & Aronson, 1995). Emerging technologies like augmented reality (AR) have the potential to bridge these gender gaps by making biology more engaging for both male and female students (Gandhi, Yusuf & Lawal, 2021).

Augmented Reality Teaching Strategy

Augmented Reality (AR) has become an innovative teaching tool, particularly in science education, where it enhances the learning of complex subjects like biology. By offering interactive, 3D visualizations of abstract concepts, such as cell structures and biological processes, AR improves students' understanding of topics that are difficult to grasp through traditional methods (Lee, Park & Choi, 2014). AR caters to diverse learning styles, fostering engagement and motivation, which ultimately leads to improved retention and academic performance (Bower, Howe, McCredie, Robinson & Grover, 2014; Dunleavy et al., 2009). Specifically, in cell biology, AR helps students visualize microscopic phenomena, making them more accessible and tangible (Cheng & Tsai, 2013). Despite challenges like the need for teacher training and technological access, AR's potential to revolutionize biology education by offering immersive and interactive experiences is significant (Radianti, Majchrzak, Fromm & Wohlgenannt, 2020).

Methodology

Research Design

This study employed a quasi-experimental design, with a pre-test/post-test methodology to assess the academic performance of male and female students in cell biology before and after an AR-based teaching intervention. A mixed-methods approach was used, combining quantitative data from performance tests with qualitative data from student surveys to capture perceptions of learning.

Population and Sample

The study was conducted in two secondary schools in Sokoto State, Nigeria, where biology is part of the core curriculum. the research involved a sample size of 105 (53 male and 52 female) senior secondary two (SS II) students during the 2024/2025 academic session in Sokoto state were selected from the target population using multi-stage sampling technique from classes offering biology in the selected schools.

Data Collection Instruments

The following instruments were developed by the researcher to collect data:

1. **Pre-test/Post-test**: Academic performance was assessed using a standardized biology test named Cell Biology Academic Performance Test (CBAPT) focused on cell biology, administered before and after the intervention. The instrument had reliability index of 1 and validity index of 0.86.
2. **Student Surveys**: A Cell Biology Students' Perception Survey (CBSPS) was used to capture students' perceptions of biology as a subject, their engagement in the learning process and their preferences for learning methods. The instrument had reliability index of 0.85 and validity index of 0.82.

Data Analysis

Data were analyzed using independent sample t-tests to compare post-test scores for male and female students. Additionally, qualitative data from surveys and observations were analyzed thematically to explore students' perceptions and engagement with the learning material.

Presentation of Results

The result of the study is presented in order of the research hypotheses

Ho_1: There is no significant mean difference in academic performance scores of male and female students taught cell Biology using Augmented Reality strategy in Sokoto State

Table 2: Difference in the academic performance of male and female students taught using AR

Variables	N	Mean	Mean Difference	Std. Deviation	*t*-Cal	*p*-Value	Decision
Male	53	25.66	-0.44	3.186	-.741	.460	H_0 Accepted

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202568

Female	52	26.10	2.325

Source: Field work, 2025

The academic performance scores of male and female students taught cell biology using AR were subjected to an independent samples t-test analysis. The results, as shown in Table 2, the mean difference of -0.44 indicate no significant difference in academic performance between male and female students thus H01 which stated there is no significant gender difference in the academic performance of secondary school students in cell biology after an AR-based teaching intervention in Sokoto State, Nigeria was accepted. Both male and female students showed significant improvement in their post-test scores.

H_{O2}: There is no significant mean response in level of academic engagement of male and female students taught cell Biology using Augmented Reality strategy in Sokoto State

Table 3: Academic engagement of students taught cell biology using AR strategy

Gender	N	Average response
Male	53	52%
Female	52	86%
Total	105	

Source: Field work, 2025

Observations and survey data in table 3 revealed that female students exhibited higher levels of engagement, actively participating in discussions and demonstrating a strong interest with 86% in the content. In contrast, male students with 52%were more prone to distraction and expressed a preference for short-term rewards over long-term academic goals. The perceptions of the AR-based teaching intervention varied by gender. Female students generally reported positive experiences, finding the interactive elements engaging and helpful in understanding complex cell biology concepts. They felt more confident and motivated to participate in class. In contrast, male students were more mixed in their reactions, with some appreciating the novelty of AR but others expressing frustration with the pace and preferring more hands-on activities with immediate rewards. While the AR intervention captured their attention at times, male students seemed to prefer learning methods that provided quicker, tangible outcomes.

H_{O3}: There are no significant contributory factors affecting significant mean difference in academic performance scores of male and female students taught cell Biology using Augmented Reality strategy in Sokoto State

Table 4: Factors contributing to gender difference

Factor	Effect on male	Effect on female
Culture	Moderate	High
Interest	Moderate	High
Motivation	Moderate	High
Learning style	Moderate	High
Teaching method	Moderate	High
Technology	High	Moderate
Peer influence	High	Moderate
Confidence and self-efficacy	High	Moderate

Source: Field work, 2025

Observations recorded by the researcher revealed that cultural expectations, societal pressures, interest, motivation, peer influence and confidence among others were identified as factors influencing students' academic behaviors. Female students tended to value academic achievement more highly and were less likely to be distracted, while male students focused more on immediate rewards, which may have impacted their focus during lessons.

Discussion of Findings

The findings of this study indicate that while the AR-based teaching intervention did not result in significant gender differences in academic performance, female students were more engaged and focused, which aligns with prior research on gender differences in engagement and learning behaviors. Female students often demonstrate greater involvement in classroom activities and exhibit more consistent study habits, factors linked to better performance in biology (Baker & Leary, 2018). This is consistent with Hyde (2005) assertion that girls tend to excel in subjects that require memorization and detailed study. However, the lack of significant performance differences suggests that the AR intervention may have had an equalizing effect, offering both genders a more interactive and engaging way to learn. In contrast, other studies suggest that boys, despite lower

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202568

engagement, may excel in more hands-on, competitive tasks (Smith & Jones, 2020). Therefore, the AR strategy might not address all gender-specific preferences for learning, which could be crucial in improving academic outcomes across genders.

Factors Influencing Gender Differences

Cultural norms in Sokoto State likely contribute to the observed gender differences in engagement. Traditional gender roles may shape students' academic behaviors, with females more likely to prioritize academic achievement and boys more influenced by extrinsic motivations like immediate rewards.

Conclusion

This study highlights the importance of gender-sensitive teaching strategies in enhancing learning outcomes for both male and female students. While AR-based instruction did not result in significant gender differences in academic performance, it is clear that engagement and societal factors play crucial roles in shaping students' academic behaviors. To promote gender equality in education, both teachers and policymakers must consider these factors when designing and implementing educational strategies.

Recommendations

1. **For Educators**

To enhance engagement for both male and female students, teachers should adopt interactive teaching methods like multimedia, practical activities, and collaborative learning. For female students, strategies such as project-based learning, critical thinking tasks, and peer collaboration can further foster academic involvement. It's essential to ensure both genders are equally included in competitive tasks, promoting an inclusive environment that supports active participation from all students. Gender-sensitive teaching strategies should empower both male and female students to contribute meaningfully to the learning process.

2. **For Policymakers**

Policymakers should focus on improving teacher training, particularly in the use of interactive and student-centered teaching methods like AR. They should also promote gender equality in education through policies that challenge traditional gender roles and encourage both male and female students to pursue academic success in all subjects.

Suggestions For Further Studies

Future studies should explore the long-term effects of AR-based interventions on gender differences in learning outcomes and expand the sample size to include other regions of Nigeria. Additionally, qualitative studies that focus on student narratives about their gendered experiences in science education could provide valuable insights. This study highlight the need for further research into how AR can cater to both male and female learning preferences more effectively, potentially through adapting the intervention to include more diverse, hands-on, and competitive elements that appeal to different genders.

References

Adesina, A. A., & Olorundare, A. S. (2019). Influence of gender and study habits on students academic achievement in biology in senior secondary schools in Nigeria. *Nigerian Journal of Curriculum and Instruction, 26(1), 30–40.*

Afolabi, M., & Ogunyemi, O. (2020). Re-examining the role of senior secondary education in Nigeria: A case study of biology education. *Journal of Educational Studies, 5(2), 45–57.*

Akanbi, S. (2016). Gender differences in academic achievement in science subjects among secondary school students in Nigeria. *International Journal of Education, 8(3), 45–56.*

Akinbobola, A. (2020). Challenges in rural education: The case of Sokoto State, Nigeria. *Journal ofAfrican Education, 18(3), 99–110.*

Akpan, I. J. (2021). Exploring gender-based engagement with augmented reality in science classrooms: A Nigerian perspective. *Journal of Emerging Educational Technologies, 9(2),112–125.*

Anderson, T., Smith, J., & Taylor, R. (2021). Enhancing biology education with augmented reality: A review of the literature. *Journal of Educational Technology, 15(3), 243–260.*

Baker, T., & Leary, M. (2018). Gender differences in science education: The role of classroom behaviors and engagement. *Journal of Educational Psychology, 110(2), 170–180.*https://doi.org/10.1037/edu0000239

Blickenstaff, J. C. (2005). Women and science careers: Leaky pipeline or gender filter? *Gender and Education, 17(4), 369–386.* https://doi.org/10.1080/09540250500145072

Bower, M., Howe, C., McCredie, N.,Robinson, A., & Grover,D.(2014). Augmented reality in education – Cases, places and potentials. *Educational Media International, 51(1), 1–15.*

Buchmann, C., DiPrete, T. A., & McDaniel, A. (2008). *Gender inequalities in education. Annual Review of Sociology, 34, 19–337.*

Cheng, K. H., & Tsai, C. C. (2013). Affordances of augmented reality in science learning: Suggestions for future research.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202568

Journal of Science Education and Technology, 22, 449–462.

Dufresne, R. J., Gerace, W. J., & Leonard, W. J. (2002). The use of augmented reality for science education. *Journal of Science Education and Technology, 11(1), 21–29.*

Dunleavy, M., Dede, C., & Mitchell, R. (2009). Affordances and limitations of emerging technologies for learning in science. *Journal of Science Education and Technology, 18(4),244–251.*

Eagly, A. H., & Wood, W. (2012). Social role theory. In P. J. Burke & A. M. K. T. Jackson (Eds.), *Handbook of social psychology (pp. 58–69).* Springer.

Ezeani, L., Nnadi, D., & Odili, C. (2021). Challenges in teaching biology in Nigeria: A case study from Sokoto State. *African Journal of Education, 28(1), 98–110.*

Gandhi, S., Yusuf, M. A., & Lawal, A. A. (2021). The role of augmented reality in bridging gender gaps in science classrooms: A case study of Nigerian secondary schools. *Journal of Educational Technology and Innovation, 14(3), 65–78.*

Garcia, D., & Gonzales, R. (2021). Socio-cultural influences on gender differences in academic performance: The case of biology education. *Gender and Education, 33(1), 1–18.*

Halim, L., & Meerah, S. M. (2015). Gender differences in science achievement: A study on student engagement and motivation. *International Journal of Science Education, 37(9), 1419–1435.*

Hyde, J. S. (2005). The gender similarities hypothesis. *American Psychologist, 60(6), 581–592*. https://doi.org/10.1037/0003-066X.60.6.581

Lee, J. J., Park, S., & Choi, H. (2014). The effect of augmented reality on the learning of anatomy. *Computers in Biology and Medicine, 45, 63–72*.

Mahoney, K. (2020a). The role of teaching strategies in gender-based academic outcomes. *Journal of Education Psychology, 30(2), 123–135.*

Mahoney, K. (2020b). Gender and educational outcomes in science: A global perspective. *International Journal of Educational Psychology, 32(1), 22–35.*

Møller, J. (2020). Gender differences in science education: A global perspective. *International Journal of Science Education, 42(7), 1089–1106.*

Musa, B. (2021). Challenges in secondary education in Nigeria: Focus on Sokoto State. *Nigerian Educational Review, 27(1), 111–123.*

Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I.(2020). A systematic review of augmented reality applications in education – Advantages and challenges. *Computers & Education, 146, 103778.*

Roberts, D., & Taylor, S. (2022). Engagement and gender differences in science education: A comparative study. *Journal of Educational Psychology, 41(3), 214–230.*

Smith, J. T., & Jones, M. P. (2020). Exploring gender differences in science education: Teacher-centered vs. student-centered approaches. *Educational Research Journal, 15(4), 123135.* https://doi.org/10.1016/j.edures.2020.03.004

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology, 69(5), 797–811.* https://doi.org/10.1037/0022-3514.69.5.797

Valkenburg, P. M., Kremers, S. P., & de Vries, P. J. (2020). Exploring gender differences in augmented reality learning environments. Journal of Educational Technology, 57(3), 273–289.

Wu, H. K., Lee, S. W. Y., Chang, H. Y., & Liang, J. C. (2013). Current status, opportunities, and challenges of augmented reality in education. *Computers & Education, 62, 41–49.* https://doi.org/10.1016/j.compedu.2012.10.024

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202569

Impact of Blockchain-Integrated Instruction on Awareness and Attitude in Science and Mathematics Education among Secondary School Students in Zaria, Kaduna State

SANI, Mustapha Bichi[1]
msbichi@abu.edu.ng
+2348069615779

ALIYU, Zaharaddeen[1]
zaliyu@abu.edu.ng
+2348062087468

FAGGE, Adamu Muhammad[2]
adamfagae@gmail.com
+2348068126734

BAKO, Hauwa[1]
bakohauwa82@gmail.com
+2348085454572

[1]Department of Science Education, Ahmadu Bello University, Zaria, Kaduna State, Nigeria
[2]Department of Science Education, Sa'adatu Rimi College of Education Kumbotso, Kano state, Nigeria

Abstract
Impact of blockchain-integrated instruction on awareness and attitude in Science and Mathematics Education among secondary school students in Zaria, Kaduna State. The study adopted a quasi-experimental research design with a non-equivalent pre-test and post-test control group. The study was guided by two objectives with their corresponding research questions and null hypotheses. The population of the study comprised all SSII (Senior Secondary II) students enrolled in public secondary schools in the zone, totaling approximately 8,750 students across 20 co-educational institutions. From this population, a sample of 240 students was drawn using a multi-stage sampling technique. The population of the study comprised all SSII (Senior Secondary II) students enrolled in public secondary schools in the zone, totaling approximately 8,750 students across 20 co-educational institutions. From this population, a sample of 240 students was drawn using a multi-stage sampling technique. Two instruments were used to collect data; BSAT and EDUAS. A pilot study involving 40 SSII students from a similar school (not included in the main study) was conducted to determine the instruments' reliability. The results yielded a Cronbach's Alpha coefficient of 0.84 for BSAT and 0.81 for EDUAS. Descriptive statistic of mean and standard deviation was used to answer the research questions raised while at inferential level, Analysis of Covariance (ANCOVA) was used to test the null hypotheses formulated at $p < 0.05$. Findings revealed that Students exposed to blockchain-supported science and mathematics instruction demonstrated significantly higher levels of awareness of sustainability concepts than their peers taught using conventional methods. It is therefore concluded that the statistically blockchain- integrated instruction enhanced learning environments as it bridges the gap between abstract curriculum content and real-world relevance, thus promoting critical thinking, responsible digital citizenship, and sustainable habits. It is recommended among others that Government and donor agencies should allocate resources toward pilot projects and research initiatives that explore the scalability of blockchain in education

Keyword: blockchain-integrated instruction, science and mathematics education, digital transformation, SDG 4, educational innovation

Introduction
The global push toward sustainable development and digital transformation has reshaped the paradigms of teaching and learning, particularly in the domains of science and mathematics education. Among the emerging technologies, blockchain stands out as a revolutionary digital infrastructure that promises transparency, traceability, and security in data management. Traditionally associated with financial technologies, blockchain is now finding relevance in educational systems, where ethical data handling and sustainable practices are becoming increasingly critical (Pallavi & Choudhary, 2022). As educators and policymakers seek to integrate sustainability into curriculum frameworks, the use of blockchain technology in science and

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202569

mathematics classrooms provides new opportunities for modeling transparency, validating academic processes, and enabling ethical collaboration through decentralized systems (Tan et al., 2023). Blockchain's potential in education lies in its decentralized ledger system, which ensures immutable records, secure credentialing, and real-time verification of academic performance and research data (Agarwal & Pathak, 2021). In mathematics education, blockchain can be harnessed to create secure environments for problem-solving platforms, peer evaluations, and transparent assessment records, promoting academic integrity. Similarly, science education can benefit from blockchain applications in citizen science projects, where sustainability and reproducibility of data are essential. The use of blockchain-based digital portfolios and badges can also promote a sustainable model of credentialing that reduces paper-based certification and increases trust in academic achievements (Uddin et al., 2023). Moreover, the alignment of blockchain with the principles of Sustainable Development Goal 4 (SDG 4) ensuring inclusive and equitable quality education and promoting lifelong learning is increasingly gaining attention. As students engage in scientific investigations and mathematical modeling, blockchain tools can offer a platform for ethical data tracking, reproducible research, and decentralized sharing of findings. This aligns with the growing emphasis on teaching data literacy, environmental ethics, and systems thinking in 21st-century STEM education (Subramanian & Mahmoud, 2021). By combining sustainability education with blockchain's transparency mechanisms, educators can foster a culture of accountability and ethical reasoning in students, particularly in the management of scientific and mathematical data. Furthermore, integrating blockchain in educational ecosystems supports a broader pedagogical shift toward interdisciplinary, student-centered, and digitally literate classrooms. This emerging approach not only enhances learners' engagement but also prepares them to navigate complex global issues such as climate change, misinformation, and ethical use of technology. However, despite its potential, the application of blockchain in science and mathematics education remains under-researched, especially in the context of developing countries. Thus, this study explores the emerging role of blockchain in promoting sustainable, ethical, and transparent practices in science and mathematics instruction, with a focus on empowering educators and learners to leverage decentralized technologies for educational and societal transformation.

This study is underpinned by two complementary theoretical perspectives: Connectivism Learning Theory and Ethical Constructivism, both of which provide a strong lens for understanding the integration of blockchain in science and mathematics education, especially in the context of sustainability and ethical data use. Connectivism, proposed by Siemens (2005), argues that learning in the digital age is no longer solely an internal, individualistic activity, but is instead driven by the ability to form connections across a network of digital tools, people, and information. As blockchain systems function as decentralized networks that store, verify, and share knowledge securely, they serve as real-world applications of connectivists principles. In science and mathematics classrooms, blockchain can enable students to engage in collaborative, transparent, and technology-mediated learning experiences, enhancing their engagement with data, evidence, and peer accountability. Ethical Constructivism, on the other hand, posits that students develop moral and ethical reasoning through active participation in authentic tasks involving decision-making, responsibility, and consequences (Nucci, 2001). The integration of blockchain-based assessments, digital credentials, and traceable project logs cultivates ethical habits of mind—students learn not just what to think but how to think ethically about the data and decisions they make in STEM learning contexts. In terms of existing literature, the potential of blockchain in education has gained traction globally, although its application in secondary education is still emerging. According to Turkanović et al. (2018), blockchain allows for immutable and verifiable educational records, helping to eliminate fraud, enhance data privacy, and streamline credentialing. In science education, Wang et al. (2021) noted that integrating blockchain into project-based environmental science modules facilitated transparent data sharing, encouraged reproducibility, and fostered digital citizenship among students. Likewise, Uddin et al. (2023) explored how blockchain enhanced accountability in STEM group work through timestamped submissions and peer verifications, thus aligning learning with ethical and sustainability principles.

The use of blockchain in mathematics education also supports data-driven instructional methods. Zhang and Xie (2022) demonstrated that blockchain-based learning management systems (LMS) could track student performance across algebraic problem-solving tasks, identifying learning patterns while protecting students' privacy. This analytical capacity enables personalized feedback and equitable access to intervention strategies, a vital contribution toward achieving SDG 4. Alam and Masud (2023) further argued that blockchain improves inclusivity by offering portable digital identities to learners in underserved communities, facilitating cross-border recognition of competencies in math and science subjects. From a sustainability perspective, blockchain enhances transparency and traceability in educational projects related to environmental science and statistical modeling. Li and Feng (2023) found that high school students who used blockchain-based digital science portfolios were more reflective and accurate in their data logging and peer reviews. These practices not only minimized

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202569

academic dishonesty but also reinforced the scientific value of openness and reproducibility. De la Rosa and García (2022) assert that integrating blockchain into STEM teaching frameworks helps bridge the gap between digital transformation and sustainability education, equipping learners with skills to ethically navigate and contribute to global systems. Despite these potentials, several scholars highlight challenges in blockchain adoption, including infrastructure demands, teacher readiness, and privacy regulation concerns (Mishra & Rani, 2021; Huang et al., 2023). However, recent developments in blockchain-as-a-service (BaaS) and lightweight decentralized applications (DApps) have started mitigating these issues, making blockchain more accessible for educational use (Rahman et al., 2022).

In summary, the literature supports the role of blockchain as a transformative tool in science and mathematics education. It facilitates ethical data practices, enhances transparency in assessments, and promotes sustainability by modeling traceable, responsible digital citizenship. These contributions are particularly vital in the context of developing nations where educational systems are grappling with credibility, equity, and technological readiness. The reviewed studies provide the foundation upon which the present study seeks to investigate the concrete impacts of blockchain on learners' understanding of ethical data use and sustainability consciousness within Nigerian secondary schools.

Despite growing interest in sustainability and digital transformation in education, science and mathematics classrooms remain largely underexposed to cutting-edge technologies such as blockchain. While many educational systems have begun integrating digital tools to enhance data tracking and academic transparency, the ethical use of educational data, especially in relation to environmental sustainability and data security, remains a major challenge. In many developing countries, including Nigeria, assessments and academic records are often manually processed, raising issues of inaccuracy, data loss, manipulation, and lack of transparency. Moreover, students rarely engage with authentic practices that model ethical data use, which is a critical competency in the digital age. Science and mathematics education, which provide fertile grounds for data modeling, evidence-based reasoning, and systems thinking, lack frameworks that demonstrate how data integrity and sustainability are maintained in real-world applications. While blockchain technology has been recognized globally for its capacity to enhance data traceability, reduce waste, and ensure transparency, its integration into school curricula, particularly in STEM-related disciplines, remains underexplored. This study addresses the gap by investigating how blockchain applications can be purposefully integrated into science and mathematics education to enhance students' understanding of ethical data practices, promote transparent assessment systems, and support sustainability education in line with global development goals.

Objectives of the study

The study has the following objective. To:

1. Examine the impact of blockchain-based tools on students' understanding of ethical data handling in science and mathematics classrooms.
2. Investigate how blockchain integration influences students' perception of sustainability and transparency in academic assessments and project-based learning.

Research Questions

The study is guided by the following research questions:

1. How does the use of blockchain tools in science and mathematics education influence students' understanding of ethical data use and sustainability?
2. What is the effect of blockchain-enhanced instruction on students' perceptions of transparency and trust in academic assessment systems?

Null Hypotheses

The following null hypotheses were formulated and tested at the 0.05 level of significance:

H_{01}: There is no significant difference in students' understanding of ethical data use between those taught using blockchain-enhanced instruction and those taught using conventional methods.

H_{02}: Blockchain-based instructional methods do not significantly affect students' perceptions of transparency and sustainability in science and mathematics education.

Methodology

This study adopted a quasi-experimental research design with a non-equivalent pre-test and post-test control group format to investigate the impact of blockchain-integrated instruction on students' understanding of ethical data use and sustainability awareness in science and mathematics education. The study was conducted in selected senior secondary schools within the Zaria Education Zone, Kaduna State, Nigeria, an area characterized by a mix of urban and semi-rural educational settings with

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202569

growing interest in digital transformation initiatives. The population of the study comprised all SSII (Senior Secondary II) students enrolled in public secondary schools in the zone, totaling approximately 8,750 students across 20 co-educational institutions. From this population, a sample of 240 students was drawn using a multi-stage sampling technique. First, four schools with basic ICT infrastructure were purposively selected. Then, using simple random sampling (balloting method), two intact classes were assigned as the experimental group (120 students) and two as the control group (120 students). The experimental group received instruction in mathematics and science topics through a blockchain-supported digital learning platform that allowed students to log their data entries, access timestamped feedback, verify group work participation, and transparently submit assignments and experiments with tamper-proof records. The control group received the same content through conventional teacher-centered methods without any blockchain integration. The instruments used for data collection were two researcher-designed tools: the Blockchain Sustainability Awareness Test (BSAT) and the Ethical Data Use Attitude Scale (EDUAS). The BSAT comprised 30 multiple-choice items aligned with Bloom's revised taxonomy, assessing conceptual understanding of sustainability issues (such as traceability, transparency, and digital integrity) within science and mathematics contexts. The EDUAS consisted of 20 Likert-scale items measuring students' ethical reasoning and attitudes towards data privacy, ownership, and responsible use of digital tools. Both instruments were subjected to rigorous validation by three experts in Science and Mathematics Education and one ICT/blockchain specialist at Ahmadu Bello University, Zaria. A pilot study involving 40 SSII students from a similar school (not included in the main study) was conducted to determine the instruments' reliability. The results yielded a Cronbach's Alpha coefficient of 0.84 for BSAT and 0.81 for EDUAS, indicating strong internal consistency. Pre-test scores were collected from both groups to establish baseline equivalence and control for initial differences in prior knowledge and ethical orientation. After a six-week intervention period, post-tests were administered. Quantitative data analysis was performed using Analysis of Covariance (ANCOVA) to examine the adjusted mean differences between the experimental and control groups on post-test scores, controlling for the pre-test. The ANCOVA model was chosen to isolate the effect of the blockchain-enhanced instruction and to determine the significance of observed differences in performance and attitudes. Additionally, effect sizes (using partial eta squared) were computed to assess the practical significance of the findings. The threshold for statistical significance was set at $p < 0.05$. Furthermore, descriptive statistics such as means, standard deviations, and bar charts were used to provide insights into trends in students' ethical reasoning and sustainability perspectives. The methodology ensured robust internal validity through instrument validation, random sampling, and pre-test matching, while external validity was supported by a representative sample and alignment with real-world educational conditions in Nigerian secondary schools.

Presentation of Results

To address the research objectives and test the formulated hypotheses, data obtained from the Blockchain Sustainability Awareness Test (BSAT) and the Ethical Data Use Attitude Scale (EDUAS) were analyzed using Analysis of Covariance (ANCOVA). This was done to adjust for the effect of pre-test scores and to compare post-test performances between the experimental and control groups. The results are presented in two parts corresponding to the two dependent variables: (1) Sustainability awareness and (2) Ethical data use attitudes.

Research Question 1

How does the use of blockchain tools in science and mathematics education influence students' understanding of ethical data

Table 1: Descriptive Statistics of Pre-test and Post-test Scores of Students' Sustainability Awareness

Group	N	Mean (Pre-test)	SD (Pre-test)	Mean (Post-test)	SD (Post-test)
Experimental	120	23.42	4.31	31.88	3.56
Control	120	23.06	4.48	25.44	4.61

From Table 1, students in both groups had nearly equal mean scores at pre-test, indicating equivalence in prior knowledge. However, the post-test mean for the experimental group (M = 31.88) was significantly higher than the control group (M = 25.44), suggesting a potential effect of the blockchain-enhanced instruction.

Null Hypothesis 1

H_{01}: There is no significant difference in students' understanding of ethical data use between those taught using blockchain-enhanced instruction and those taught using conventional methods.

Table 2: ANCOVA Summary for Students' Sustainability Awareness

Source	SS	df	MS	F	p-value	Partial η^2
Pre-test (Covariate)	419.63	1	419.63	20.45	.000	.081
Group (Treatment)	978.77	1	978.77	47.73	.000	.167
Error	4262.32	236	18.06			
Total	5660.72	238				

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202569

Interpretation: After adjusting for pre-test scores, there was a statistically significant difference in the post-test scores of students' sustainability awareness between the experimental and control groups, $F(1, 236) = 47.73$, $p < .001$. The partial eta squared ($\eta^2 = 0.167$) indicates a large effect size, meaning that 16.7% of the variance in post-test scores can be attributed to the intervention. This suggests that the integration of blockchain significantly enhanced students' understanding of sustainability concepts.

Research Question 2

What is the effect of blockchain-enhanced instruction on students' perceptions of transparency and trust in academic assessment systems?

Table 3: Descriptive Statistics of Students' Ethical Data Use Attitudes

Group	N	Mean (Pre-test)	SD (Pre-test)	Mean (Post-test)	SD (Post-test)
Experimental	120	54.12	7.34	68.47	6.02
Control	120	53.81	7.58	59.33	7.96

Table 3 shows an increase in students' attitudes toward ethical data use in both groups. However, the gain in the experimental group was noticeably higher.

Null Hypothesis 2

H_{02}: Blockchain-based instructional methods do not significantly affect students' perceptions of transparency and sustainability in science and mathematics education.

Table 4: ANCOVA Summary for Students' Ethical Data Use Attitudes

Source	SS	df	MS	F	p-value	Partial η^2
Pre-test (Covariate)	888.35	1	888.35	22.56	.000	.087
Group (Treatment)	1627.94	1	1627.94	41.32	.000	.149
Error	9297.03	236	39.39			
Total	**11813.32**	**238**				

Interpretation: After controlling for pre-test differences, there was a significant effect of the blockchain-based intervention on students' attitudes towards ethical data use, $F(1, 236) = 41.32$, $p < .001$, with a large effect size of $\eta^2 = 0.149$. This result confirms that the blockchain-enabled learning environment had a meaningful and practical influence on students' ethical reasoning and appreciation of responsible data practices.

Discussion of Findings

The findings of this study provide compelling evidence that integrating blockchain technology into science and mathematics education significantly enhances students' sustainability awareness and their ethical attitudes toward data use two pillars of digital citizenship and sustainable development in the 21st century. The statistically significant differences observed in both variables between the experimental and control groups affirm the pedagogical value of blockchain as a transformative instructional tool in STEM education. This discussion interprets the results in light of extant literature and theoretical underpinnings. The substantial improvement in students' sustainability awareness following the blockchain-based instruction aligns with earlier studies that emphasize the power of interactive and transparent systems in promoting responsible thinking. For instance, Aina et al. (2022) reported that distributed ledger technologies, when adapted for educational purposes, create real-world simulations that strengthen learners' understanding of global issues such as climate action, clean energy use, and resource tracking. This result is consistent with that of Yin, Duan, and Zhao (2021), who highlighted that blockchain, by offering traceability and immutable documentation, helps students engage with sustainable thinking by observing transparent data flow and impact visualization. The significant increase in the experimental group's performance supports the constructivist theory, which posits that learning is most effective when learners are actively involved in constructing knowledge based on experience (Piaget, 1972; Vygotsky, 1978).

In a similar vein, the marked improvement in students' ethical data use attitudes corroborates findings by Nemer et al. (2023), who argued that when students are exposed to technologies that simulate real-world accountability, they begin to internalize values of transparency, fairness, and digital integrity. The blockchain's architecture of decentralized and non-editable records instills a cognitive model of trust and accountability, which helps in shaping students' understanding of ethical data behavior. Berman and Korsten (2020) further noted that blockchain applications in education foster a data culture in which learners take ownership of their records, track learning milestones, and better understand the implications of ethical breaches in digital systems. The experimental group's superior outcome resonates with Bandura's Social Cognitive Theory (1997), particularly in terms of observational learning, which suggests that students imitate systems and behaviors that are rewarded and reinforced.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202569

Furthermore, the findings support the argument that emerging technologies like blockchain, when embedded in science and mathematics education, act as catalysts for achieving Sustainable Development Goal 4 (SDG 4) —inclusive and equitable quality education. According to UNESCO (2023), technology-enabled education that builds skills in digital literacy, ethics, and sustainability is pivotal for empowering students with lifelong competencies. This aligns with Sayed et al. (2022), who emphasized that technologies promoting accountability, traceability, and transparency are essential tools for addressing the quality dimension of SDG 4 in low- and middle-income countries, including Nigeria. The observed large effect sizes for both constructs indicate the practical significance of blockchain as a learning intervention. This is especially critical in resource-constrained educational environments where there is a growing need for tools that can not only deliver content but also foster ethical reasoning and critical thinking. The integration of blockchain aligns with the Technological Pedagogical Content Knowledge (TPACK) framework (Mishra & Koehler, 2006), which underscores the importance of blending technology with pedagogical strategies and content knowledge for maximum learning impact. In summary, the results suggest that blockchain is not merely a financial or industrial tool it is a powerful educational innovation capable of fostering critical global competencies such as sustainability consciousness and ethical decision-making. The intervention, by simulating real-life accountability and transparency within the classroom, offers students not only knowledge but also the value systems essential for navigating a data-driven, sustainability-conscious world.

Conclusion

The findings of this study underscore the transformative potential of blockchain technology in science and mathematics education, particularly as a catalyst for fostering sustainability awareness and ethical data practices among secondary school students. By integrating blockchain-based instructional strategies, learners not only demonstrated higher conceptual understanding of sustainable practices but also developed a greater appreciation for ethical data management both of which are critical competencies in today's digital and sustainability-focused era. The statistically significant differences observed between the experimental and control groups confirm that blockchain-enhanced learning environments can bridge the gap between abstract curriculum content and real-world relevance, thus promoting critical thinking, responsible digital citizenship, and sustainable habits. The implications extend beyond academic achievement; they encompass the broader goal of preparing learners to function as ethically aware, environmentally conscious, and data-literate global citizens. These outcomes align with the United Nations Sustainable Development Goal 4 (SDG 4), which calls for inclusive and equitable quality education that promotes lifelong learning opportunities. Blockchain's decentralization, transparency, and immutability features provide a unique educational framework through which students can engage in meaningful problem-solving, self-monitoring, and evidence-based reasoning. Additionally, the findings support the constructivist learning theory and TPACK framework, showing that thoughtfully integrated digital tools can deepen engagement and extend knowledge acquisition in STEM classrooms.

Recommendations

1. Curriculum Integration of Blockchain in STEM Education: Education policymakers and curriculum developers should consider incorporating blockchain principles into science and mathematics syllabi, especially at the senior secondary level. This will enable learners to interact with concepts of sustainability, transparency, and digital accountability in a real-world context.
2. Teacher Professional Development: Teachers need structured training programs on blockchain technology and its pedagogical applications. Workshops and certification programs should be developed to equip science and mathematics educators with the skills to design blockchain-integrated lessons that are practical, inquiry-based, and aligned with sustainable development themes.
3. Development of Blockchain-Enabled Learning Platforms: Educational technology developers should create localized, student-friendly blockchain learning platforms tailored to the Nigerian context. These platforms should promote collaborative learning, traceable progress, and gamified ethical decision-making environments to enhance engagement.
4. Policy and Funding Support for Emerging Technologies: Government and donor agencies should allocate resources toward pilot projects and research initiatives that explore the scalability of blockchain in education. Targeted investments should prioritize under-resourced schools to minimize the digital divide.
5. Cross-Disciplinary STEM Projects: Schools should promote interdisciplinary projects where students use blockchain applications to simulate environmental monitoring, data ethics case studies, or track renewable energy consumption thus blending science, mathematics, and social responsibility in a cohesive learning model.
6. Further Research: Future studies should explore the long-term impacts of blockchain-integrated pedagogy across different subjects, regions, and educational levels. Longitudinal research can help establish the sustainability and broader applicability of such

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202569

References

Agarwal, R., & Pathak, P. (2021). Blockchain for secure academic records: A decentralized approach to integrity in education. *International Journal of Educational Technology in Higher Education, 18*(2), 45–60. https://doi.org/10.1186/s41239-021-00249-8

Aina, T., Bello, T., & Okonkwo, C. (2022). Blockchain applications in environmental science education: A novel approach to data transparency and peer learning. *Journal of Environmental Education Technology, 31*(4), 221–236. https://doi.org/10.1080/17530350.2022.2022213

Berman, S., & Korsten, L. (2020). Student ownership and transparency: Blockchain-enabled portfolios in STEM classrooms. *Educational Technology Research and Development, 68*(5), 2391–2407.https://doi.org/10.1007/s11423-020-09812-1

Huang, X., Zhao, L., & Li, J. (2023). Barriers to blockchain adoption in developing country education sectors. *International Journal of Educational Management, 37*(1), 89–104. https://doi.org/10.1108/IJEM-02-2022-0061

Mishra, P., & Rani, S. (2021). Blockchain in education: Pedagogical implications and challenges. *British Journal of Educational Technology, 52*(3), 1451–1468. https://doi.org/10.1111/bjet.13034

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record, 108*(6), 1017–1054.

Nemer, D., Foster, M., & Ruiz, A. (2023). Accountability in classroom data practices: Lessons from blockchain pilot projects. *Journal of Learning Analytics, 10*(1), 1–18. https://doi.org/10.18608/jla.2023.2105

Nucci, L. (2001). Education in the moral domain. *Cambridge University Press*.

Pallavi, P., & Choudhary, S. (2022). Ethical credentialing: Blockchain for sustainable certification in schools. *International Journal of Educational Innovation, 9*(3), 98–114. https://doi.org/10.5173/ijei.2022.4018

Piaget, J. (1972). *The epistemology of interdisciplinary relations*. New York: International Universities Press.

Rahman, M. A., Asaduzzaman, M., & Siddiqui, S. (2022). Blockchain-as-a-service: Enabling accessible educational innovation. *Journal of Educational Computing Research, 57*(7), 2056–2074. https://doi.org/10.1177/0735633120911133

Subramanian, L., & Mahmoud, R. (2021). Teaching data sustainability in STEM: Digital literacy and ethical practice. *Computers & Education, 168*, 104197. https://doi.org/10.1016/j.compedu.2021.104197

Tan, E., Li, H., & Wang, J. (2023). Transparent learning ecosystems: Blockchain in mathematics assessment. *Education and Information Technologies, 28*(1), 571–588. https://doi.org/10.1007/s10639-022-11140-w

Turkanović, M., Hadžialic, M., & Selimi, D. (2018). EduCTX: A blockchain-based higher education credit platform. *IEEE Access, 6*, 5112–5127. https://doi.org/10.1109/ACCESS.2018.2797959

Uddin, R., Islam, M. M., & Rahman, Z. (2023). Blockchain-based collaboration: Enhancing integrity in STEM group projects. *International Journal of STEM Education, 10*(1), 27. https://doi.org/10.1186/s40594-023-00412-5

UNESCO. (2023). *Education for sustainable development: Learning environments that nurture transparency and ethical awareness*. United Nations Educational, Scientific and Cultural Organization.

Wang, C., Zhang, P., & Huang, R. (2021). Blockchain in citizen science: Promoting transparency in environmental data collection. *Environmental Monitoring and Assessment, 193*(3), 125. https://doi.org/10.1007/s10661-021-08897-3

Zhang, L., & Xie, Y. (2022). Decentralized student data management: Blockchain in mathematics education. *Journal of Mathematics Teacher Education, 25*(4), 533–552. https://doi.org/10.1007/s10857-021-09482-7

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202570

Effects of Gagne's Instructional Strategy on Retention in Mathematics among Senior Secondary School Students in Kogi State, Nigeria

IDRIS, Ibrahim Omeiza[1]
ibromeiza@gmail.com
+2348072424481

RABIU, Ahmed Tijjani[2]
atrabiu64@gmail.com
+2348023731035

[1]Institute of Education, Ahmadu Bello University, Zaria
[2]Department of Mathematics, Federal University of Education, Zaria

Abstract
The study investigated effects of Gagne's instructional strategy (GIS) on retention in Mathematics among senior secondary school students in Kogi state, Nigeria. The research adopted quasi-experimental-control design involving pre-test, post-test and post post-test. The population consists of all SS II students totaling 20,835 students from three (3) senatorial districts in Kogi State. 300 SS II students (140 males and 160 females) were sampled from six intact arm of classes from six (6) schools (two each) in 3 senatorial districts in Kogi State using multi-stage cluster sampling technique. Mathematics Performance Test (MPT) was used as instrument for data collection with a reliability coefficient of 0.68 obtained using Pearson Product Moment Correlation Coefficient (PPMC). Two research questions were raised and two hypotheses were formulated and tested at 0.05 level of significance. The research questions were answered using mean and standard deviation while the hypotheses were tested using related sample t-test, and paired sample t-test respectively. The findings reveal that: there was significant difference between the post-test and post post-test mean retention scores of students taught mathematics concepts using GIS and there was also significant difference between the post-test, post post-test mean retention scores of male and female students taught mathematics concept using GIS. The study concluded that Gagne's instructional strategy has significant effect in improving student's retention ability as well as capable of improving male and female students' retention ability in mathematics. It was recommended among others that the three tiers of government federal, state and local governments through ministry of education should organize seminars and workshop to equip secondary school mathematics teachers on the use of Gagne's instructional strategy.
Keywords: Gagne's Instructional Strategy, Retention and Mathematics.

Introduction
The importance of Mathematics to modern culture of science and technology has been well recognized and accepted worldwide (Eguavon, 2012). According to Ukeje (1997) cited in Bashir, Abubakar and Garba (2016), the increasing importance and attention given to mathematics stem from the fact that without science there is no modern technology and without modern technology, there is no modern society. In other words, Mathematics is the precursor and queen of science and technology and indispensable single element in modern societal development. It is an acknowledge fact that mathematics knowledge is needed to make for effective learning and development of science concepts. Different Mathematical topics such as vectors, calculus, logarithms, arithmetic, rate, summation are applied to solve scientific problems. In physics, area as thermal physics, thermodynamics, quantum physics, electric field, wave, motion and sound require a sound mathematics knowledge for proper comprehension (Onwuka & Iweka, 2017). Chemist, Biologist, Medical doctor, Pharmacist, Engineer, Physicist and many more need the application of mathematical technique (Onwuka, 1985) cited in Ojo and Egbon (2017). The importance of mathematics to nation building has led the Federal Government of Nigeria to make mathematics a core subject to be offered by secondary school students in Nigeria as stipulated in the National Policy on Education (FRN, 2013). In addition, it is studied as a compulsory subject at both lower and upper basic education in Nigeria so that every school child will acquire appropriate basic mathematics knowledge. To crown it all, graduates of secondary school in Nigeria are required to pass mathematics at credit level in WAEC, NECO and their equivalence to gain admission into tertiary institution. It is worthwhile to develop retention ability of secondary school students in such important subject.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202570

Retention plays a major role in the understanding, comprehensibility and application of mathematical concepts. Akinsola and Popoola (2014) observed that students' performance in mathematics becomes poorer as the test items moved from those requiring ability to recall to those involving some understanding and problem solving. Retention has been described by Bichi (2017) as the ability to maintain and later recall information or knowledge gained after learning. Retention of concepts learnt assist in reflective thinking and the retained concepts could be used (Ochonnoger,1997) as quoted by (Alice, 2017). Eze and Bot (2018) observes that learning outcome is influenced by the instructional strategy employed by teacher; it is the only factor that can easily be maneuver by teacher to achieve learning objectives. It is an acknowledged fact that the mathematics classroom in senior secondary schools in Nigeria has been associated with conventional teaching method, a teachers-centered approach which does not involve students in an active learning and does not promote insightful learning and long-term retention of some abstract concepts. It has been characterized as lecture-based method because it emphasizes passive acquisition of knowledge in such a way that students become passive learners of knowledge which promotes rote learning (Okoli, 2008). However, the National Policy on Education stipulated that education activities shall be learner centered for maximum self-development and self-fulfillment. The need to devise alternative effective instructional strategy that work in line with the desire of this policy is the purpose of this study. The researcher therefore, seeks to examined if Gagne Instructional Strategy could be an alternative effective instructional strategy that can improve the retention ability of secondary school students in mathematics.

Gagne's Instructional Strategy (GIS) is a student's-centered approach developed for planning the teaching process in computer and internet-based program. It is a technology intensive process and the model is a synthesis behaviuor and cognitive psychology. It is based on the information processing model of the mental events that occur when learners are presented with various stimuli and focuses on the learning outcomes and how to arrange specific instructional events to achieve those outcomes. Instructions may be conceived as a deliberately arranged set of external events designed to support internal learning process and retention. Gagne's theory of instruction is perhaps a clearer demonstration of a comprehensive instructional theory. The events of instruction according to Gagne et al (2005) cited in Effiom (2024) refers to methods or procedures designed to facilitate the specific processes (such as encoding, retention, retrieval and so on) thought to occur during learning. Gagne's Instructional Strategy involve nine activities namely Gaining attention, informing the learner of the objective, stimulating recall of prior learning, presenting the stimulus, providing learning guidance, eliciting performance, providing feedback, assessing performance and enhancing retention and transfer (Effiom, 2024). Khadjooi, Rostami and Ishaq (2011) posited that the Strategy provides framework for designing effective instruction by outlining a sequence of events that enhance learning and promote retention of knowledge and skills which generally improve students' performance and retention. The most significant outcome of using GIS is that, students retain their learnt concepts and are better problem solvers when working alone after being part of a group. This could be a clear inference that GIS is a valuable tool in a teacher's arsenal that can enhance students' problem-solving ability and their retention (Tang et al., 2020). The study conducted by Adanyi (2019); Alhaji and Abdullahi (2023) revealed that there was significant difference between the Posttest and Post-posttest mean retention scores of students in experimental group treated with Gagne's Instructional Strategy and similarly, students on gender basis. But contrary results was obtained by Agboghoroma, Job and Akpakiniovo (2022) whose study pointed out that there was no significant difference between the Posttest and Post-posttest mean retention score of students exposed to Gagne's Instructional Strategy and also students on gender basis. The researcher therefore, determined the impact of Gagne's Instructional Strategy on Retention Ability in Mathematics among Senior Secondary School Students in Kogi State Nigeria.

Performance in Mathematics at the Nigerian secondary school level in WASSCE has improved for the past few years as per the WAEC Chief Examiner's Report (2022, 2023, and 2024) based on the statistics of students with A's, B's, and C's. With this development in terms of performance, more is needed to be done to maintain the tempo. Again, this does not mean that success has been attained in teaching mathematics as there are lots of factors that still militate against the teaching and learning of mathematics at the secondary school level that must be addressed, among which is instructional strategy used by mathematics teachers. Eze and Bot (2018) observes that learning outcome is influenced by the instructional strategy employed by teacher; it is the only factor that can easily be maneuver by teacher to achieve learning objectives. It is an acknowledged fact that the mathematics classroom in senior secondary schools in Nigeria has been associated with conventional teaching method, a teachers-centered approach which does not involve students in an active learning and does not promote insightful learning and long-term retention of some abstract concepts. It has been characterized as lecture-based method because it emphasizes passive acquisition of knowledge in such a way that students become passive learners of knowledge which promotes rote learning. However, the National Policy on Education (2013) stipulated that education activities shall be learner centered for maximum self-development and self-fulfillment. The need to devise alternative effective instructional strategy that work in line with the

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202570

desire of this policy is the purpose of this study. It is on this note; the researchers, seeks to examined if Gagne Instructional Strategy could be an alternative effective instructional strategy that can improve the retention ability of secondary school students in mathematics.

Objectives of the Study

The objectives of this study are to:

1. Investigate the effects of Gagne's Instructional Strategy on retention ability of senior secondary school students' in Mathematics.
2. Find out the effect of Gagne's Instructional Strategy on the retention ability of male and female senior secondary school students in Mathematics.

Research Questions

The following questions were raised to guide the study:

1. What is the difference between the post-test and post post-test retention mean score of students taught Mathematics concepts using Gagne's Instructional Strategy?
2. What is the difference between the post-test and post post-test retention mean score of male and female students taught Mathematics concepts using Gagne's Instructional Strategy?

Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance:

Ho_1: There is no significant difference between the post-test and post post-test retention mean score of students taught Mathematics concepts using Gagne's Instructional Strategy.

Ho_2: There is no significant difference between the post-test and post post-test retention mean score of male and female students taught Mathematics concepts using Gagne's Instructional Strategy.

Methodology

The study employed a quasi-experimental research design involving pre-test, posttest and post post-test. The design was adopted because it is not possible to have a complete randomization of the subjects as this would disrupt school organization. Samples of 300 (SS11) Students were selected from a population of 20,835 (SS11) Students within Kogi State. The sample consists of 160 students (76 males and 84 females) in the Control Group (CG) and 140 students (62 males and 78 females) in the Experimental Group (EG). Multistage Cluster Sampling Technique was used to select sample for the study. This involved six intact arms of classes from six schools (two from each senatorial district) randomly selected from the three senatorial districts in Kogi State. Mathematics Performance Test (MPT) was developed for Pretest, Posttest and Post-Posttest. It contained 20 items and multi-choice Format with option a-d. The instrument was validated and the reliability coefficient using Pearson Product Moment Correlation Coefficient (PPMCC) was computed to be 0.69. The students in both CG and EG were given MPT to test the equity of their ability levels followed by a treatment for five (5) weeks with CG students taught with conventional method and EG students taught using Gagne's Instructional Strategy. At the end of the treatment, Post-test was administered to the two groups and a reshuffle MPT was administered after two weeks to the EG students only, to determine retention ability. Descriptive statistics (mean and standard deviation) were used to analyze collected data to answer the research questions and inferential statistics Related Sample t-test and Paired Sample t-test were used to analyze data to test the formulated null hypothesis Ho_1 and Ho_2 respectively at 0.05 level of significance. This is because the data collected in respect of them were interval data.

Presentation of Results

The data obtained from the study were analyzed using version 23.0 of the Statistical Packages for Social Sciences (SPSS) as follow:

1. What is the difference between the post-test and post-posttest retention ability mean score of students taught mathematics concepts using Gagne's Instructional Strategy?

Table 1: Summary of Retention Mean Scores and Standard Deviation of Students in Post-test and Post-posttest

Variable	Test	N	Mean	SD	Mean Difference
Retention	Post-test	140	48.96	6.98	7.39
	Post-posttest	140	56.35	5.25	

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202570

Analysis in Table 1 revealed that the Post-test and Post-posttest mean score of students are 48.96 and 56.35 with standard deviation 6.98 and 5.25 respectively and a difference of 7.39 in favour of post-Posttest. In order to establish if the difference between the Post-test and Post-posttest mean score is statistically significant, inferential statistics was used to test the formulated null hypothesis as presented in Table 3.

2. What is the difference between Post-test and Post-posttest Retention mean score of Male and Female Students taught Mathematics Concepts using Gagne's Instructional Strategy?

Table 2: Summary of Retention Mean Scores and Standard Deviation of Male and Female Students in Post-test and Post-posttest

Variable	Gender	Test	N	Mean	SD	Mean Difference
Retention	Male	Post-test	62	49.19	6.54	7.82
		Post-posttest	62	57.01	5.13	
	Female	Post-test	78	49.09	6.28	8.03
		Post-posttest	78	57.12	5.01	

Analysis in Table 2 revealed that the Post-test and Post-posttest mean score of male students are 49.19 and 57.01 with standard deviation 6.54 and 5.13 respectively and a difference of 7.82 in favour of post-Posttest. Result occurred in the same manner for Post-test and Post-posttest mean score of female students which are 49.09 and 57.12 with standard deviation 6.28 and 5.01 respectively and a difference of 8.03 in favour of post-Posttest. In order to establish if the difference between the Post-test and Post-posttest mean score are statistically significant, inferential statistics was used to test the formulated null hypothesis.

Testing the Hypotheses

Ho_1: There is no significant difference between post-test and post post-test retention mean score of students taught mathematics concepts using Gagne's Instructional Strategy.

To test the formulated null hypothesis, related sample t-test was used to analyze the collected data as presented in Tables 3.

Table 3: Summary of Related Sample t-test on the Significant Differences between the Post-test and Post-posttest Mean Retention Score in Experimental Group.

Variable	Test	N	Mean ($\bar{x}$)	SD	df	t-value	P-value	Remark
Retention	Post-test	140	48.96	6.98	139	4.86	.002	*
	Post-posttest	140	56.35	5.25				

* Significant at $P \leq 0.05$ level of significance

The result in Table 3 showed significant difference $P = 0.002 < 0.05$. level of significance. The null hypothesis was therefore rejected. This implies that there is significant difference between the Post-test and Post-posttest retention mean scores of students taught mathematics concepts using Gagne's Instructional Strategy.

Ho_2: There is no significant difference between post-test and post post-test retention mean score of male and female students taught mathematics concepts using Gagne's Instructional Strategy.

To test the formulated null hypothesis, Paired sample t-test was used to analyze the collected data as presented in Tables 4.

Table 4: Summary of Paired Sample t-test Statistics on the difference between Post-test and Post-Posttest Mean Retention Scores of Male Students in the Experimental Group.

Gender	Test	N	Mean ($\bar{x}$)	SD	df	t-value	P-value	Remark
Male	Post-test	62	49.19	6.54	61	4.17	.003	*
	Post-posttest	62	57.01	5.13				
Female	Post-test	78	49.09	6.28	77	3.98	.015	*
	Post-posttest	78	57.12	5.01				

* Significant at $P \leq 0.05$ level of significance

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202570

The result in Table 4 showed significant differences: P = 0.003 < 0.05 and P = 0.015 < 0.05 respectively. The null hypothesis was therefore rejected. This implies that there is significant difference between the Post-test and Post-posttest retention mean scores of males and students taught mathematics concepts using Gagne's Instructional Strategy.

Discussion of Findings

The related sample t-test analysis in Table 2 showed significant differences between the Post-test and Post-posttest mean score of students in experimental group exposed to Gagne's Instructional Strategy as treatment in favour of post-posttest. This implies that the P value was less than 0.05 alpha level. This result provide support for the capability of the strategy in bringing about improved students' retention ability in mathematics. This result supports the findings of Adanyi (2019) who lamented that Gagne's Instructional Strategy (GIS) enhances students' retention ability in mathematics but it contradicted that of Agboghoroma, Job and Akpakiniovo (2022) which showed that Gagne's Instructional Strategy was not effective in increasing students' retention ability. The paired Sample t-test analysis in Table 4 showed significant differences between the Post-test and Post-posttest mean score of male and female students in experimental group exposed to GIS treatment in favour of post-posttest, meaning that in each sex, the P value was less than 0.05 alpha level. This result provide support for the capability of the GIS in bringing about improved male and female students' retention ability in mathematics. The result, though not in conformity with the finding of Agboghoroma, Job and Akpakiniovo (2022) but agreed with the result of the study of Alhaji and Abdullahi (2023) who discovered that both male and female students taught with Gagne's Instructional Strategy significantly increased their mean retention scores in Post-posttest over the Post-test.

Conclusion

Based on the findings of this study, it was concluded that Gagne's instructional strategy has significant effect in improving student's retention ability as well as capable of improving male and female students' retention ability in mathematics.

Recommendations

The following recommendations were made base on the findings from the study:

1. Gagne's instructional Strategy is capable of improving retention ability in mathematics base on the result of the study. Hence, the three tiers of government: federal, state and local governments through ministry of education should organize seminars and workshop training to equip secondary school mathematics teachers on the use of Gagne's instructional strategy.
2. Teacher training institutions such as Universities and Colleges of education that train secondary school mathematics teachers should incorporate the use of Gagne's instructional strategy part of their mathematics teacher education curriculum to promote the teaching of mathematics as it enhances students' retention as well as students on gender bases.

Acknowledgements

We sincerely appreciate the Zonal Inspectors of Education, Secondary School Principals and Mathematics teachers in Kogi State for their invaluable contributions to the success of this study. Their unwavering support, cooperation and dedication played a vital role in facilitating the research process. We are deeply grateful for their commitment and assistance throughout the course of this study.

References

Adanyi, A. (2019). Impact of Gagne's instructional strategy on acquisition of science skills, performance and retention among basic science students in Zaria Educational Zone, *Nigeria* (Unpublished Master's Thesis) Ahmadu Bello University, Zaria, Nigeria.

Agboghoroma, T.E., Job, B.M. & Akpakiniovo (2022). Effects of Gagne's learning hierarchy on students' achievement, retention and attitude in secondary school physics in Delta State, Nigeria. *Innovation journal, 70*(1), 348 – 357.

Akinsola, M. K, & Popoola, A.A, (2014). A comparative study of the effectiveness of two strategies of solving mathematics problems on the academic achievement of secondary school students. *The journal of the mathematical association of Nigeria, 29* (1), 41 – 48.

Alhaji, M. B. & Abdullahi, M. (2023). *Effects of Gagne's learning hierarchy on students' academic achievement and retention in mathematics, among senior secondary schools in Kano Metropolis, Kano State, Nigeria.* (Unpublished Master's Thesis). Bayero University, Kano, Nigeria.

Alice, D. J. (2017). The use of analogy to enhance performance and retention of concepts in evolution among NCE III biology students in Niger State. An Unpublished M.Sc (ED) thesis, Ahmadu Bello University, Zaria, Nigeria.

Bashir, S., Abubakar, G. & Garba, H.A. (2026). Effect of Using Concept Mapping Strategy on Senior Secondary School Students' Achievement and Retention in Geometry. *International Journal of Education and Evaluation, 2*(2), 38 – 43.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202570

Bichi, S.S. (2017). Effect of problem-solving strategy and enriched curriculum in secondary school. *ABACUS, Mathematics Education Series 42*(1).

Effiom, W.A. (2024) Effect of Gagne's Instructional Strategy on Interest, Performance and Retention in Algebra among Senior Secondary School Students in Katsina State. Unpublished thesis, Ahmadu Bello University, Zaria.

Eguavon, O.J. (2012). Mathematics: The heartbeat of information Technology Implication for Secondary Education. *Journal of mathematical Association of Nigeria (MAN),* 27(1), 10-12.

Eze, J. E., & Bot, T. D. (2018). Effect of concept mapping on secondary school students' achievement in Mathematics in Bichi Education Zone, Kano State. *African Journal of Arts, Science and Educational Issues, 2*(2), 45 – 56.

Federal Ministry of Education (2013). *National policy on education*. Lagos: NERDC press.

Khadjooi, K., Rostami, K. & Ishaq, S. (2011). How to use Gagne's model of instructional design in teaching psychomotor skills. *Gastroenterol Hepatol Bed Bench,4*(3): 116–119.

Ojo,_O.A. & Egbon, F.O. (2017). Effect of Concept Mapping Strategy on Students' Achievements and Retention in Senior Secondary School Mathematics in Ekiti State. *IJRAR International Research and Analogical Review, 4*(2), 1 – 7.

Okoli, J. U. (2008). *Restoring Quality in Secondary Schools in Teaching of Mathematics*. Owerri: Totan Publishers Ltd.

Onwuka, F.O., Onwuka, P.I. & Iweke, S. (2017). Remediation of Mathematics in Physics as an enhancement strategy for achievement in Physics education. *Abacus: Journal of Mathematics Association of Nigeria, 35*(1), 120-126

Tang, W. L., Tsai, J. T. & Huang, C. Y. (2020). Inheritance coding with Gagne-based learning hierarchy approach to developing mathematics skill assessment system. *Applied Science, 10* (1465), 1-18.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202571

Assessment on Integrating Artificial Intelligence Technological and Pedagogical Competencies among Secondary School Chemistry Teachers in Kaduna State, Nigeria

ANASO, Joy N[1].
joyanaso@gmail.com

ANASO, Chukwuebuka P[2].
ebukaanaso09@gmail.com

[1]Department of Chemistry, Federal University of Education Zaria, Kaduna State, Nigeria
[2]Department of Water, Environment, Construction and Safety, Magdeburg Stendal University of Applied Sciences

Abstract
The study assessed the Integration of Artificial Intelligence Technological and Pedagogical Competencies among Secondary School Chemistry Teachers in Kaduna State, Nigeria. Adopting a descriptive survey design, the research was guided by two research questions and two corresponding null hypotheses. A random sampling technique was employed to select a representative group of chemistry teachers from various secondary schools within the state. The sample comprised 150 chemistry teachers (72 males and 78 females), drawn from a population of 1,500 teachers across 80 secondary schools. To collect data, the researcher developed a structured questionnaire comprising two sections: Section 1, titled Artificial Intelligence Chemistry Teachers' Technological Competence for Curriculum Implementation Questionnaire (AICTTCCIQ), and Section 2, Artificial Intelligence Chemistry Teachers' Pedagogical Competence for Curriculum Implementation Questionnaire (AICTPCCIQ), each containing seven items. The instrument was face-validated by two data analysts and two senior chemistry educators from the Department of Science Education, Ahmadu Bello University, Zaria. Reliability testing using Cronbach's alpha yielded coefficients of 0.71 and 0.73 respectively, indicating a satisfactory level of internal consistency. Data analysis involved the use of means to address the research questions, while t-test statistics were used to test the hypotheses at the 0.05 significance level. Key findings from the study include: (i) Both male and female chemistry teachers exhibited low levels of competence, technologically and pedagogically, in the application of AI tools for teaching. (ii) There was no statistically significant difference between male and female teachers regarding their technological competence in AI. (iii) Similarly, no significant difference was found in pedagogical competence related to AI usage between genders. Based on these findings, the study recommended that the Kaduna State government, in collaboration with relevant educational agencies, should prioritize the provision of essential AI tools and infrastructure. Such support would enable chemistry teachers to effectively integrate AI into lesson planning, delivery, and assessment, thereby enhancing the quality of chemistry education in secondary schools.

Keywords: Artificial Intelligence, Competence, Chemistry teachers, Secondary school.

Introduction
The world is undergoing a significant transformation driven by the rise of Artificial Intelligence (AI), which is reshaping various aspects of human endeavor, including education. In the 21st century, AI has the potential to revolutionize chemistry education by offering personalized learning experiences, interactive simulations, and data-driven instructional strategies. According to Anaso (2024a), chemistry is a vital branch of science concerned with the composition, properties, and reactions of substances, and the ways these reactions can be harnessed to form new materials. Within the secondary school curriculum, chemistry holds a prominent position due to its foundational role in scientific understanding. Science itself, as Anaso (2021) emphasized, is a dynamic discipline rooted in the empirical study of natural phenomena, underpinning much of modern life. AI's integration into science—particularly chemistry—empowers students to explore abstract concepts through dynamic visualization and individualized learning pathways. Anaso (2024b) further highlighted that such technologies enable students to gain deeper understanding through immersive simulations and modeling environments tailored to their unique learning needs. In today's interconnected world, integrating AI into chemistry instruction is not merely advantageous—it is essential for enhancing educational quality and fostering learner autonomy. Students can now learn at their own pace, concentrating on areas where they need the most support, ultimately improving their academic outcomes. This sentiment is echoed by Opesemowo & Ndlovu (2024), who described AI as a transformative force across numerous sectors, including education. Dai

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202571

& Ke (2022) further characterized AI as a revolutionary tool in education, marking a paradigm shift from passive reception of knowledge to active, student-centered learning. AI algorithms can analyze individual learning styles and performance patterns to generate personalized educational experiences. Marr (2024) noted that in the modern educational landscape, AI stands out as one of the most transformative technologies, enabling smarter decision-making, automation, and tailored learning solutions. Specifically in chemistry, AI enhances the understanding of complex chemical structures and reactions. Culican (2024) affirmed the potential of AI and machine learning to significantly improve educational accessibility and learning outcomes. Berber et al. (2025) observed that AI is most commonly applied in pharmacology and biochemistry, particularly in molecule design and predictive modeling. However, they also pointed out a critical gap: the discussion around using AI in secondary-level chemistry education remains limited despite the increasing relevance of such technologies. To effectively bridge this gap, Lameras and Amab (2022) stressed the need for educators to develop the AI-related skills necessary for integration into the science classroom. Jiang et al. (2024) supported this view, noting that knowledge of AI methodologies is not yet widespread among secondary chemistry teachers. Koehler et al. (2013) underscored the importance of developing teachers' Technological Knowledge (TK), Technological Pedagogical Knowledge (TPK), and Technological Content Knowledge (TCK) to successfully design and deliver AI-enhanced instruction. They argued that these competencies are essential if educators are to fully understand and convey the underlying concepts of their subject areas. Against this backdrop, the current study was initiated to investigate the areas of technological and pedagogical competence where AI usage is currently applied in chemistry teaching. It also aims to explore gender differences in AI competence among secondary school chemistry teachers in Kaduna State, Nigeria.

Artificial Intelligence Competence, in this context, refers to a teacher's ability to understand how AI technology functions, their societal implications, and the capacity to engage with them ethically, responsibly, and collaboratively. Technological competence encompasses the foundational knowledge, skills, and abilities required to use technology effectively, while pedagogical competence in AI involves the strategies and attitudes necessary to meaningfully integrate AI into classroom instruction. To date, there appears to be a lack of specific empirical studies exploring AI competence both technologically and pedagogically among chemistry teachers in Kaduna State secondary schools. This study, therefore, seeks to fill this important research gap. Its goal is to provide educational administrators, policymakers, and curriculum developers with insights necessary for designing targeted interventions to enhance chemistry teachers' competencies in the application of AI, thereby improving teaching quality and learning outcomes in science education.

Artificial Intelligence (AI) holds immense potential for transforming the teaching of chemistry through the integration of advanced technologies such as Machine Learning (ML), Deep Learning (DL), and Natural Language Processing (NLP). These tools can enrich the educational experience by enabling predictive modeling, interactive simulations, automated assessments, and personalized learning pathways. However, despite increasing advocacy for AI integration within Nigeria's educational landscape, many secondary school chemistry teachers still struggle to understand how to meaningfully apply AI tools within their classroom instruction. A critical limitation lies in the quality and availability of data, as such, AI models are only as effective as the datasets they are trained on, and in the context of chemistry education, relevant data may be scarce or fragmented. While previous research has largely concentrated on the adoption and general potential of AI in education, far less attention has been paid to evaluating the actual competence of chemistry teachers or the practical challenges they face in leveraging AI in real classroom settings. In Kaduna State, the level of AI adoption and the competence of secondary school chemistry teachers both technologically and pedagogically remains unclear. This knowledge gap serves as the impetus for the current study, which seeks to assess the proficiency of chemistry teachers in utilizing AI tools and to uncover the specific barriers hindering successful integration. By identifying these constraints and evaluating teachers' readiness, the study aims to provide actionable insights that can guide policy formulation, training programs, and support systems for effective AI integration in chemistry education.

Objective of the study

The study aims at:

i. Assessing the integration of AI technological competence among male and female chemistry teachers in secondary schools in Kaduna State.
ii. Examining the integration of AI pedagogical competence among male and female chemistry teachers in secondary schools in Kaduna State.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202571

Research Questions

The following research questions guided the study

1. What is the mean response on integration of AI technological competence among male and female chemistry teachers in secondary schools in Kaduna State?
2. What is the mean response on integration of AI pedagogical competence among male and female chemistry teachers in secondary schools in Kaduna State?

Null Hypotheses

The following null hypotheses were formulated and tested at 0.05 significant levels:

1. There is no significant difference in the mean response on integration of AI Technological competence among male and female chemistry teachers in secondary schools in Kaduna State.
2. There is no significant difference in the mean response on integration of AI pedagogical competence among male and female chemistry teachers in secondary schools in Kaduna State.

Significance of the study

The findings of this study would aid educational administrators, policy makers and curriculum implementers on how to design effective means of improving the competence of chemistry teachers in AI usage in chemistry classrooms. The findings would also enhance accessibility and inclusivity of AI to wider range of teachers and students.

Literature Review

Artificial Intelligence (AI) in chemistry represents a specialized intersection of computer science and chemical sciences, where complex chemical—often biochemical—reactions are simulated to gain deeper insights into processes such as molecular evolution, self-assembly, and other intricate biochemical phenomena. This fusion of AI and chemistry is revolutionizing educational practices by enabling personalized learning, adaptive instruction, real-time assessment, and individualized feedback for students. At its core, AI encompasses a suite of technologies that allow machines to perform advanced cognitive functions—ranging from visual recognition and natural language processing to data analysis and predictive modeling. In the context of modern chemistry education, AI serves as a powerful tool for enhancing efficiency and productivity in the learning process. Some of these tools include Wolfram Alpha, a computational knowledge engine that provides students with instant answers and explanations to chemistry questions; PhET Interactive Simulation is another AI tool that allows students to explore complex chemical concepts in a visual and engaging way.

AI therefore enables students to explore chemical principles more deeply, simulate reactions with greater accuracy, predict outcomes, and visualize molecular structures and processes in real time. Additionally, AI facilitates the design of new molecules and materials, analyzes large chemical datasets, detects trends in reactions, and provides instant feedback—thereby helping students pinpoint areas needing improvement and guiding their progression. According to Daves (2023), AI systems are capable of processing and analyzing vast volumes of data in real time, empowering users to make informed decisions more quickly and effectively. The increased speed and precision offered by AI translate into cost savings, improved educational outcomes, and streamlined instructional workflows. Zafrullah et al. (2023) observed that AI applications in education have gained widespread attention, becoming increasingly popular across educational institutions. Falebita (2024) further emphasized that AI is transforming classroom instruction by revolutionizing every aspect of the teaching and learning process—from lesson planning and content delivery to student evaluation. They described AI as embodying the capacity of machines to respond adaptively to new situations, solve complex problems, answer questions, strategize, and exhibit behaviors traditionally attributed to human intelligence. In mathematics education, Aliyu et al. (2024) noted that AI technologies bring a host of benefits, including personalized tutoring, adaptive assessments, real-time feedback, and collaborative learning environments. Across all disciplines, AI enhances educational experiences by customizing learning paths to suit individual needs, automating administrative tasks, and improving the functionality and effectiveness of online learning platforms.

Methodology

The study employed a descriptive survey design to collect data from chemistry teachers in secondary schools across Kaduna State, Nigeria. A random sampling technique was adopted to ensure the selection of a representative sample from the broader population of 1,500 chemistry teachers spread across 80 secondary schools in the state. From this population, a sample of 150 chemistry teachers was drawn, comprising 72 males and 78 females. To collect data, the researcher developed a structured questionnaire divided into two sections: Section 1 contained 7 items under the title Artificial Intelligence Chemistry Teachers' Technological Competence for Curriculum Implementation Questionnaire (AICTTCCIQ), while Section 2 featured another 7 items titled Artificial Intelligence Chemistry Teachers' Pedagogical Competence for Curriculum Implementation

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202571

Questionnaire (AICTPCCIQ). The instrument was rigorously face-validated by a panel of experts, including two experienced data analysts and two senior chemistry educators from the Department of Science Education, Ahmadu Bello University, Zaria. Responses were recorded using a four-point Likert scale: Strongly Agree (4 points), Agree (3 points), Disagree (2 points), and Strongly Disagree (1 point). The reliability of the instrument was established using Cronbach's alpha, yielding coefficients of 0.71 and 0.72 respectively for the two sections—indicating a high degree of internal consistency. To facilitate effective administration of the questionnaire, the researcher collaborated with six trained research assistants. The return rate for the administered questionnaires was 100%, ensuring full participation from all sampled respondents. A benchmark score of 2.50 was set as the decision point for determining competence levels. Accordingly, a mean score of 2.50 and above was interpreted as indicating moderate to high competence, while scores below 2.50 reflected low competence. Data analysis was conducted using means and standard deviations to address the research questions, while independent sample t-tests were employed to test the hypotheses at a 0.05 level of significance. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS), Version 20.

Presentation of Results

The results are presented according to the research questions and hypotheses

Research Question1: What is the mean response on integration of AI technological competence among male and female chemistry teachers in secondary schools in Kaduna State?

Table 1: Technological Competence of chemistry teachers on AI usage

S/N	Competence Area/variables	Mean Male	Mean Female	Grand Mean	Competence Level	Decision
1	Use AI soft and hard ware for chemistry teaching in the classroom	2.30	2.20	2.25	Low	Disagreed
2	Use AI powered tutoring systems to provide immediate feedback based on students' progress	2.10	2.05	2.08	Low	Disagreed
3	Use AI to create interactive simulations that allow students to explore chemical reactions.	2.20	2.30	2.25	Low	Disagreed
4	Use AI to generate visualizations of complex chemical processes.	2.30	2.20	2.25	Low	Disagreed
5	Use AI in designing new molecules and materials by predicting their properties	2.05	2.10	2.08	Low	Disagreed
6	Use AI to track students' progress and patterns and providing targeted support	2.35	2.40	2.38	Low	Disagreed
7	Use AI to explore and support deeper understanding of chemical principles.	2.45	2.30	2.38	Low	Disagreed
	Overall Mean	**2.25**	**2.22**			

The results in Table 1 show the overall mean score for male and female chemistry teachers as 2.25 and 2.22; with corresponding standard deviations of 1.02 and 1.21 respectively. Both male and female teachers had low level of technological competence in using Artificial Intelligence tools. Teachers' competence in using AI powered tutoring systems to provide immediate feedback based on students' progress was the lowest among the variables, indicating significant challenge in integrating AI into immediate feedback purposes. Another challenge observed was in the use of AI to design new molecules and materials by predicting their properties. Overall, the technological competence of chemistry teachers in using AI is low, with the male performing statistically insignificantly higher than the female teachers.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202571

Research Question 2: What is the mean response on integration of AI pedagogical competence among male and female chemistry teachers in secondary schools in Kaduna State?

Table 2: Pedagogical Competence of male and female chemistry teachers on Artificial Intelligence usage

S/N	Competence Area/variables	Mean Male	Mean Female	Grand Mean	Competence Level	Decision
1	Use subject-specific AI applications in teaching chemistry	2.30	2.10	2.20	Low	Disagreed
2	Use of open-ended AI tools to support collaboration	2.25	2.30	2.28	Low	Disagreed
3	Use of AI for project-based learning	2.35	2.40	2.38	Low	Disagreed
4	Use AI to design and implement collaborative projects	2.10	2.35	2.23	Low	Disagreed
5	Use of AI algorithms to create customized learning	2.05	2.10	2.08	Low	Disagreed
6	Use of AI in generating visualizations of complex chemical processes	2.30	2.25	2.28	Low	Disagreed
7	Use of AI to provide translation services and adaptive text formats	2.35	2.30	2.33	Low	Disagreed
	Overall Mean	**2.24**	**2.23**			

The findings presented in Table 2 show that the overall mean scores for male and female chemistry teachers were 2.24 and 2.23, with corresponding standard deviations of 0.99 and 1.01, respectively. These results indicate that both male and female chemistry teachers demonstrated a low pedagogical competence in the use of Artificial Intelligence (AI) in classroom instruction. Notably, the lowest scoring area among the evaluated variables was the teachers' ability to utilize AI algorithms for developing personalized learning experiences, highlighting a considerable difficulty in applying AI tools to assess students' performance and learning patterns. Although male teachers recorded a marginally higher mean score than their female counterparts, the difference was statistically insignificant. Overall, the pedagogical competence of secondary school chemistry teachers in AI integration remains low across gender.

Null Hypotheses

Ho_1: There is no significant difference in the mean response on integration of AI Technological competence among male and female chemistry teachers in secondary schools in Kaduna state.

Table 3: T-test analysis on AI Technological competence among male and female chemistry teachers

S/N	Variables	N	Mean	Std. Dev	Df	t-cal	t-crit	P
	Male	72	2.25	1.02				
					148	.721	1.96	0.521
	Female	78	2.22	1.21				

The statistical data in Table 3 indicates that the male teachers reported a mean score of 2.25 while the female teachers had a slightly lower mean score of 2.22. The mean difference between the two groups is 0.03. The calculated t-value of 0.721 is significantly less than the critical t-value of 1.96 at 0.05 significant levels. The p-value of 0.521 exceeds the standard threshold of 0.05. The null hypothesis which states that "there is no significant difference in the mean response on integration of AI Technological competence among male and female chemistry teachers in secondary schools in Kaduna state" is therefore retained/accepted.

Ho_2: There is no significant difference in the mean response on integration of AI pedagogical competence among male and female chemistry teachers in secondary schools in Kaduna State.

Table 4: T- test analysis on AI Pedagogical Competence among male and female chemistry teachers

S/N	Variables	N	Mean	Std. Dev	Df	t-cal	t-crit	P
	Male	72	2.24	0.99				
					148	0.652	1.96	0.841
	Female	78	2.23	1.01				

The data in Table 4 shows that the male teachers reported a mean score of 2.24 while the female teachers had a slightly lower mean score of 2.23. The mean difference between the two groups is 0.01 which is statistically insignificant. The calculated t-value of 0.652 is significantly less than the critical t-value of 1.96 at 0.05 significant levels. The p-value of 0.841 exceeds the

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202571

standard threshold of 0.05. The null hypothesis which states that "There is no significant difference in the mean response on integration of AI pedagogical competence among male and female chemistry teachers in secondary schools in Kaduna State" is therefore retained/accepted.

Summary of Findings

1. Overall, the technological competence of chemistry teachers in using AI in the classroom is low, with the male performing slightly higher than the female teachers.
2. Overall, the pedagogical competence of chemistry teachers in using AI in the classroom is low, with the male performing slightly higher than the female teachers.
3. There is no significant difference in the AI Technological competence among male and female chemistry teachers in secondary schools in Kaduna state.
4. There is no significant difference in the AI Pedagogical Competence among male and female chemistry teachers in secondary schools in Kaduna State.

Discussion of Findings

This study investigated the competence of chemistry teachers in the application of Artificial Intelligence (AI) within secondary schools in Kaduna State, Nigeria. The descriptive analysis revealed a generally low level of AI competence among both male and female teachers, encompassing both technological and pedagogical dimensions. While there was moderate consensus among the respondents regarding their abilities, the data clearly indicate that teachers possess limited proficiency in leveraging AI tools for chemistry instruction. This deficiency may have far-reaching consequences, potentially impeding students' capacity to compete effectively in an increasingly globalized, technology-driven educational landscape. The findings underscore a significant shortfall in both AI-related resources and the professional development opportunities necessary to train teachers in effectively integrating AI into their instructional practices. Consequently, there is an urgent need for targeted interventions, including comprehensive capacity-building programs and the provision of up-to-date AI tools.

Strengthening teacher competence in this area would not only empower educators to enhance their instructional delivery but also contribute meaningfully to improved academic performance among chemistry students. Furthermore, the results from the two research hypotheses demonstrated no statistically significant differences between male and female teachers in both technological and pedagogical AI competence. This suggests a leveling of gender disparities in access to and application of AI resources within the educational context. These findings are consistent with the works of Koehler et al. (2013); Lameras and Amab (2022), and Berber et al. (2025), who emphasized the necessity of promoting both technological and pedagogical knowledge among educators—regardless of gender—to ensure the successful integration of AI in science, particularly in chemistry classrooms.

Conclusion

The findings of this study reveal that the overall competence of chemistry teachers in Artificial Intelligence (AI)—both technological and pedagogical—is notably low. Specifically, teachers demonstrated limited proficiency in utilizing AI-powered tutoring systems capable of delivering real-time feedback on students' learning progress, underscoring significant barriers to effective AI integration in the classroom. These challenges point to a critical need for well-structured, targeted professional development initiatives aimed at enhancing teachers' skills and confidence in applying AI tools in instructional settings. Implementing such training programs would significantly advance the integration of AI into chemistry education, thereby improving teaching effectiveness and student outcomes—not only in secondary schools across Kaduna State, but throughout Nigeria as a whole.

Recommendation

The following recommendations are hereby put forward

1. Chemistry teachers (male and female) should be encouraged to attend AI comprehensive programs which would increase their technological and pedagogical competence on how to use AI in designing new molecules and materials and also predicting their properties
2. Chemistry teachers should be trained on how to use AI to design and implement collaborative projects.
3. The state government in collaboration with educational bodies should provide the needed AI resources that will enable teachers implement AI curriculum in lesson planning and assessments more effectively.
4. Workshops and awareness for secondary education teachers should be developed and conducted to give teachers insight into the topic 'AI in science' in chemistry classrooms.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202571

References

Aliyu, J, A, , Hamza N O, Bashirat K, Osman, S (2024), Mathematics as the Bedrock of Artificial Intelligence and Creative Thinking for National Development in Nigeria: A Systematic Review. Zamfara International Journal of Education (ZIJE) 4, (4) 164

Anaso J.N. (2024a) Comparative Study on the Effectiveness of Demonstration and Discussion Strategies on Academic Achievement and Retention of Chemistry Concepts by students in Secondary Schools in Kaduna State, Nigeria. Journal of Science Technology and Education. 12 (3) 739-748. www.atbuftejoste.com

Anaso J.N (2021) *Critical Elements of Science Education*. Ndahi Press and Publishers, Zaria. Reprinted January 2017 and Febuary 2021

Anaso J.N. (2024b) Enhancing Chemistry Students' Academic Achievement using Molecular Models in teaching Nomenclature in Secondary Schools in Kaduna State, Nigeria. VUNOKLANG Multidisciplinary Journal of Science and Technology Education, 12(3) 294-303. https://vmjste.com.ng

Berber, S., Bruckner, M,. Maurer, N. & Huwer (2025) Artificial Intelligence in Chemistry Research - Implications for teaching and Learning. Journal of Chemical Education. 102, 1445-1456

Culican, .J. (2024) The impact of AI on educational content creation: Shaping the future of learning materials. Available from https://www.linkedin.com/pulse/impactai-educationalcontent-creation

Dai, C. & Ke, F. (2022). Educational applications of artificial intelligence in simulation-based learning: A systematic mapping review. *Computer and Education: Artificial Intelligence.* Vol 3, 2022, 100087. ISSN 2666-920X, https://doi.org/10.1016/j.caeai.2022.100087.

Daves, S. (2023) How AI can deliver personalized learning and transform academic assessment. Available from https//www.tand.fonline.com/doi/full/10.1080/03323315

Falebita, O. S. (2024). Assessing the relationship between anxiety and the adoption of Artificial Intelligence tools among mathematics preservice teachers. *Interdisciplinary Journal of Education Research, 6,* 1–13. https://doi.org/10.38140/ijer-2024.vol6.20

Jiang S., McClure .J.; Mao, H.; Chen J.; Liu, y.; Zhang, Y. (2024) Integrating machine learning and Color Chemistry: Developing a High-school Curriculum toward Real-World Problem-solving. Chemical Education. 101(2) 675-681

Koehler, M.J.; Mishra P.; Cain, W. (2013) What is Technological, Pedagogical Content Knowledge (TPACK) Journal of Education. 193 (3) 13-19

Lameras, P., & Arnab, S. (2022) Power to the Teachers: An exploratory Review on Artificial Intelligence. Education Information. 13, 14

Marr, B. (2025) How is AI used in Education-real world examples of today and apeek into the future. Available from https//bernardmarr.com/how.is-ai-used-in-education-real-world example-of-today-and-a peek-into the-future

Opesemowo, O. A. G., & Ndlovu, M. (2024). Artificial intelligence in mathematics education: The good, the bad, and the ugly. *Journal of Pedagogical Research* https://doi.org/10.33902/jpr.202426428

Zafrullah, Hakim, M. L., & Angga, M. (2023). ChatGPT Open AI: Analysis of Mathematics Education Students Learning Interest. *Journal of Technology Global*, *1*(01), 1–10.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202572

Effects of Cognitive-Restructuring-Counselling Technique and Token Economy on School-Refusal Behavior among Secondary School Students in Gwale, Kano State, Nigeria

YUSUF, Nafisa Abdulrazak
nafisaabdulrazk@gmail.com
08068049856

Department of Educational Foundation, Northwest university, Kano State

Abstract
This study investigated the effects of Cognitive Restructuring Counselling Technique and Token Economy on School Refusal Behavior among Junior Secondary School Students in Gwale Local Government Area, Kano State. The objective of the study was to assess the effects of both cognitive restructuring counselling technique and token economy on economic, social and behavioral dimensions of school refusal behavior. Three research questions with corresponding null hypotheses were raised and tested at a 0.05 significance level. The study adopted quasi-experimental design in the form of pretest and posttest design. The population of the study consists of 156 Junior Secondary School Students in Gwale Local Government Area identified with higher school refusal behavior, out of which two schools were sampled to participate in the study, 15 students from each school. Two data collection instruments were used for the purpose of the study: Validated School Refusal behavior Checklist (SRBC) with a reliability index of 0.867 was used for identification, while validated School Refusal behavior Scale (SRBS) with a reliability index of 0.706, 0.839, 0.852 and 0.904 for the three dimensions of school refusal behavior and the overall questionnaire was used for pretest and posttest. Statistical analysis, specifically t-tests for related samples and t-tests for dependent samples were used to test the hypotheses of the study at a 0.05 level of significance. The study revealed that both Cognitive Restructuring Counselling Technique and Token Economy were significantly effective in reducing school refusal behavior across all three dimensions. However, no significant difference was found between the two techniques, suggesting they were equally effective. The study recommends that schools and counsellors inculcate the use of both Cognitive Restructuring Counselling Technique and Token Economy into school guidance efforts.

Keywords: Cognitive-Restructuring, Token Economy, School-Refusal-behavior, Students

Introduction
The refusal to attend school or the struggle to maintain focus and engagement in school tasks throughout the school day is a notable indication of school refusal behaviour, a common mental health concern rooted in feelings of anxiety and fear (Kearney, 2008; Kearney & Albano, 2004). While literature discusses school phobia and truancy as potential causes for attendance issues, Kearney (2007) introduced the concept of "school refusal behaviour." This term specifically denotes a child's resistance to attending school or the challenges faced by the child in enduring classroom hours. School refusal behaviour poses a significant challenge, impacting around 1–5% of school-aged children, with similar occurrence rates among genders, particularly affecting children aged between 5 and 10 years (Fremont, 2003). Another study reported a 4% of absenteeism due to school refusal behaviour among children (Havik & Ertesvåg, 2015). School refusal behaviour is characterized by persistent and severe reluctance or refusal to attend school which poses significant challenges for both students, families, and educational systems worldwide. Education constitutes the essential framework for individual and societal advancement, providing individuals with the requisite skills and knowledge necessary for enduring success throughout life. Nevertheless, the phenomenon of school refusal behaviour among junior secondary school students represents a considerable obstacle, particularly within the context of Gwale Local Government Area in Kano State. This ongoing evasion of school attendance, frequently anchored in economic, social and behavioural dimensions, disrupts the educational process and impedes the students' potential for achievement. Effectively addressing this concern necessitates a comprehensive approach, inclusive of psychological interventions such as cognitive restructuring and token economy systems, which specifically target the fundamental causes of this behaviour.

School refusal behaviour significantly impairs students' capacity to interact with their peers, educators, and the broader academic community. Interpersonal interactions within the school setting are instrumental for the cultivation of essential interpersonal skills, emotional intelligence, and a robust sense of belonging. In school students exhibiting school refusal behaviours often encounter social isolation and stigmatization, which further intensify their disengagement from educational activities. School Refusal Behaviour encompasses a complex interplay of economic, social and behavioural factors/dimensions. From economic perspective, school refusal behaviour is associated with extensive and multifaceted, for

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202572

individual learners, inadequate attendance frequently culminates in scholastic underachievement, thereby constraining prospective employment prospects and perpetuating cycles of socioeconomic disadvantage. Most School refuses parent oftentimes encounter supplementary financial pressures as they endeavor to secure alternative educational provisions or psychological assistance for their offspring. The social dimension involve significantly impairs students' capacity to interact with their peers, educators, and the broader academic community. Interpersonal interactions within the school setting are instrumental for the cultivation of essential interpersonal skills, emotional intelligence, and a robust sense of belonging. In school students exhibiting school refusal behaviours often encounter social isolation and stigmatization, which further intensify their disengagement from educational activities. Behaviourally, school refusal behaviour refers to the actions and behaviours that an individual exhibits when going to school or refusing to go to school. It may manifest as procrastination, avoidance of school-related tasks, skipping classes, exploration, frequent tardiness and truancy. Disagreements with significant others, such as family members and peer influence can also exert pressure on individuals to pursue specific behaviour that contradict their personal interests or values, thereby These behaviours can be observed by teachers and parents and often require intervention (Elliott, 1999; Kearney & Silverman, 1990). To address the challenges of School Refusal Behaviour effectively among Junior Secondary School Students in Gwale Local Government, two counselling techniques were employed: Cognitive Restructuring Counselling Technique and Token Economy. Cognitive restructuring refers to the process of replacing cognitive distortions with thoughts that are more accurate and useful. Cognitive restructuring is a technique frequently utilized by cognitive behavioral therapists to assist clients in recognizing the interrelations between their thoughts, emotions, and behaviours. This method, deemed fundamental in cognitive therapy, educates individuals on enhancing themselves through the substitution of erroneous cognitions with constructive beliefs (Corey, 2009). On the other hand, Token economy systems involve participants earning tokens as a consequence of specific behaviours, which can then be exchanged for predetermined rewards at a later time. The central element of a token economy system is the delivery of tokens contingent on a specific behaviour, which are linked to meaningful rewards (Kazdin, 1977; Wolery, Bailey, & Sugai, 1988). Token distribution should be tailored to reflect the frequency of the targeted behaviour, with initial reinforcement rates set relatively high (Ackerman et al., 2020). Token economy is a behaviour modification technique that involves the use of tokens (such as points, stickers, or coins) as rewards for desired behaviours. The tokens can be exchanged for privileges or tangible rewards, providing positive reinforcement for the targeted behaviours.

School refusal behaviour represents one of the most critical and alarming patterns regarding secondary schools worldwide. However, it should be distinguished from truancy, as it characterizes a student's continuous refusal to completely attend or stay for an entire day in school. Students who suffer from SRB may reveal lower grades, maintain many incomplete assignments, and struggle to attend school. In social and emotional, issues, school is not only the place where students can acquire knowledge but it is also the environment that molds different aspects of their social lives. Causes of SRB may include bullying, academic stress, a negative rapport with teachers; or students not being engaged by the lessons they are learning. - Mental health challenges: It is still to be noted that certain conditions such as anxiety, depression, and phobia are major determinants of SRB predisposing factors that affect a particular person. - Family dynamics: Parents who use strategies that put emphasis on conflict or neglect, as well as overprotection, can cause a child to feel insecure, and therefore shy away from school. - Social factors: If a student is experiencing negative peer pressure, lack of support from peers, or has previous adverse experiences with bullying, then this can negatively interfere with a student's School refusal behaviour have negative attitudes towards education due to violence being viewed as independent, leading them to prioritize interaction with their peers over their obligations. This behaviour, characterized by a sustained aversion or refusal to attend school absent a legitimate physical justification, jeopardizes students' academic achievements, social maturation, and prospective opportunities. Notwithstanding the initiatives undertaken by educational institutions and families to mitigate this challenge, the incidence of absenteeism persists at alarmingly elevated levels, indicating a deficiency in efficacious intervention strategies. But without proper treatment especially at early stage, a person with SRB may become resigned to a life of near total isolation, they may go on to develop a psychiatric disorder such as substance abuse or mood disorder such as depression, SRB can be treated effectively with Cognitive Restructuring Counselling Technique and Token Economy by addressing the underlying reasons behind their disorders through the psychotherapy treatment of professional guidance counsellors. This is why the concern of this study is to investigate the treatment effects of CRCT and TE counselling technique on junior secondary school students with symptoms of SRB.

Objectives of the study

The objectives of this study were to determine

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202572

1. The effect of Cognitive Restructuring Counselling Technique on economic, social and behavioural dimensions of School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State, Nigeria.
2. The effect of Token Economy on economic, social and behavioural dimensions of School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State, Nigeria.
3. The differential effect of Cognitive Restructuring Counselling Technique and Token Economy on School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State, Nigeria.

Hypotheses:

The following Hypotheses were tested at 0.05 level of significant in the study:

Ho_1: There is no significant effect of Cognitive-Restructuring-Counselling Technique on Economic, Social and Behavioural dimensions of School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State.

Ho_2: There is no significant effect of Token Economy on Economic, Social and Behavioural dimensions of School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State.

Ho_3: There is no significant difference in the effect of Cognitive Restructuring Counselling Technique and Token Economy on School Refusal Behaviour among Secondary School Students in Gwale Local Government Area, Kano State.

Methodology

The study adopted a Quasi-Experimental design in form of Pretest-Posttest design to examine the effects of Cognitive Restructuring Counselling Technique (CRCT) and Token Economy (TE) on school refusal behaviour among secondary school students in Gwale Local Government Area, Kano State. The population consists of 156 Junior Secondary School Students identified with high levels of school refusal behaviour using the adapted School Refusal Behaviour Checklist (SRBC). The School Refusal Behaviour Scale (SRBS) was used for pretest and posttest to measure economic, social and behavioural dimensions of school refusal behaviour. Both instruments were validated and found reliable through pilot testing, with correlation coefficients of 0.867 for adapted (SRBC) and 0.706 (economic dimension) 0.839 (social dimension) 0.852 (behavioural dimension) 0.904 for overall SRBS. Data collection involved administering the adapted SRBC to identify students with school refusal behaviour, followed by administering the SRBS during pretest, 10 weeks of CRCT and TE intervention, and administering the SRCS during posttest phases. The data analyses techniques employed were t-test for related samples and t-test for independent samples to test the hypotheses at 0.05 level of significance.

Presentation of Results

The seven null hypotheses formulated to guide the study were tested below in tabular form at 0.05 level of significance:

Ho_1: There is no significant effect of Cognitive Restructuring Counselling Technique on Economic dimension of School Refusal Behaviour among Secondary School Students in Gwale Local Government Area, Kano State.

Table 1 shows t-test analysis for pre-test and post-test economic dimension of school refusal behaviour mean scores (Cognitive Restructuring Counselling Technique):

Variables	N	Mean	S.D	t-cal	Df	P-value
Pre-test Crct.Eco.	15	14.733	2.6583	4.612	14	.000
Post-test Crct. Eco.	15	11.800	2.2741			

Source: Field Work, 2025

Table 1 above shows an analysis for pre-test and post-test economic mean scores of junior secondary school students exposed to Cognitive Restructuring Counselling treatment. The t-test for related samples results indicates that cognitive restructuring counselling had a significant positive effect in reducing the economic dimension of school refusal behaviour among junior secondary school students in Gwale Local Government Area, Kano State. The mean score for school refusal behaviour decreased from 14.73 before the intervention to 11.80 after the intervention, with a mean difference of 2.933. The t-test yielded a significant result ($t = 4.612$, $df = 14$, $p = .000$), leading to the rejection of the null hypothesis. Therefore, cognitive restructuring counselling technique significantly reduced economic dimension of school refusal behaviour, demonstrating its effect in addressing this issue among the students.

Ho_2: There is no significant effect of Cognitive Restructuring Counselling Technique on Social dimension of School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State.

Table 2 shows t-test analysis for pre-test and post-test social dimension of school refusal behaviour mean scores (Cognitive Restructuring Counselling treatment):

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202572

Variables	N	Mean	S.D	t-cal	Df	P Value
Pre-test Crct.Soc.	15	13.400	1.9928	6.883	14	.000
Post-test Crct. Soc.	15	7.867	2.6691			

Source: Field Work, 2025

Table 2 above shows an analysis for pre-test and post-test social mean scores of junior secondary school students exposed to Cognitive Restructuring Counselling treatment. The t-test for related samples results indicates that cognitive restructuring counselling technique had a significant positive effect in reducing the social dimension of school refusal behaviour among junior secondary school students in Gwale Local Government Area, Kano State. The mean score for school refusal behaviour decreased from 13.400 before the intervention to 7.867 after the intervention, with a mean difference of 5.533. The t-test yielded a significant result ($t = 6.883$, $df = 14$, $p = .000$), leading to the rejection of the null hypothesis. Therefore, cognitive restructuring counselling technique significantly reduced the social dimension of school refusal behaviour, demonstrating its effect in addressing this issue among the students.

Ho_3: There is no significant effect of Cognitive Restructuring Counselling Technique on Behavioural dimension of School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State.

Table 3 shows t-test analysis for pre-test and post-test behavioural dimension of school refusal behaviour mean scores (Cognitive Restructuring Counselling treatment):

Variables	N	Mean	S.D	t-cal	Df	P-value
Pre-test Crct.Beh.	15	9.667	2.0237	7.529	14	.000
Post-test Crct. Beh.	15	4.800	1.6562			

Source: Field Work, 2025

Table 3 above shows an analysis for pre-test and post-test behavioural mean scores of junior secondary school students exposed to Cognitive Restructuring Counselling treatment. The t-test for related samples results indicates that cognitive restructuring counselling technique had a significant positive effect in reducing the behavioural dimension of school refusal behaviour among junior secondary school students in Gwale Local Government Area, Kano State. The mean score for behavioural dimension of school refusal behaviour decreased from 9.667 before the intervention to 4.800 after the intervention, with a mean difference of 4.867. The t-test yielded a significant result ($t = 7.529$, $df = 14$, $p = .000$), leading to the rejection of the null hypothesis. Therefore, cognitive restructuring counselling technique significantly reduced the behavioural dimension of school refusal behaviour, demonstrating its effect in addressing this issue among the students.

Ho_4: There is no significant effect of Token Economy on Economic dimension of School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State.

Table 4 shows t-test analysis for pre-test and post-test economic dimension of school refusal behaviour mean scores (Token Economy treatment):

Variables	N	Mean	S.D	t-cal	Df	P-value
Pre-test Te.Eco.	15	17.000	2.9032	3.537	14	.003
Post-test Te. Eco.	15	13.200	3.0519			

Source: Field Work, 2025

Table 4 above shows an analysis for pre-test and post-test economic mean scores junior secondary school students exposed to Token Economy treatment. The t-test for related samples results indicates that token economy counselling technique had a significant positive effect in reducing the economic dimension of school refusal behaviour among junior secondary school students in Gwale Local Government Area, Kano State. The mean score for economic dimension of school refusal behaviour decreased from 17.000 before the intervention to 13.200 the intervention, with a mean difference of 3.800. The t-test yielded a significant result ($t = 3.537$, $df = 14$, $p = .003$), leading to the rejection of the null hypothesis. Therefore, token economy counselling technique significantly reduced the economic dimension of school refusal behaviour, demonstrating its effect in addressing this issue among the students.

Ho_5: There is no significant effect of Token Economy on Social dimension of School Refusal Behaviour among Junior Secondary School Students in Gwale Local Governrnent Area, Kano State.

Table 5 shows t-test analysis for pre-test and post-test social dimension of school refusal behaviour scores (Token Economy treatment):

Variables	N	Mean	S.D	t-cal	Df	P-value
Pre-test Te.Soc.	15	13.667	3.5989	6.283	14	.000
Post-test Te. Soc.	15	7.4000	2.9228			

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202572

Source: Field Work, 2025

Table 5 above shows an analysis for pre-test and post-test social mean scores of junior secondary school students exposed to Token Economy treatment. The t-test for related samples results indicates that token economy counselling technique had a significant positive effect in reducing the social dimension of school refusal behaviour among junior secondary school students in Gwale Local Government Area, Kano State. The mean score for social dimension of school refusal behaviour decreased from 13.67 before the intervention to 7.400 after the intervention, with a mean difference of 6.267. The t-test yielded a significant result (t = 6.283, df = 14, p = .000), leading to the rejection of the null hypothesis. Therefore, mentoring counselling technique significantly reduced the social dimension of school refusal behaviour, demonstrating its effect in addressing this issue among the students.

Ho_6: There is no significant effect of Token Economy on Behavioural dimension of School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State.

Table 6 shows t-test analysis for pre-test and post-test behavioural dimension of school refusal behaviour mean scores (Token Economy treatment):

Variables	N	Mean	S.D	t-cal	Df	P-value
Pre-test Te.Beh.	15	13.467	4.4379	6.363	14	.000
Post-test Te. Beh.	15	5.867	2.7997			

Source: Field Work, 2025

Table 6 above shows an analysis for pre-test and post-test behavioural mean scores of junior secondary school students exposed to Token Economy treatment. The t-test for related samples results indicates that token economy counselling technique had a significant positive effect in reducing the behavioural dimension of school refusal behaviour among junior secondary school students in Gwale Local Government Area, Kano State. The mean score for behavioural dimension of school refusal behaviour decreased from 13.467 before the intervention to 5.867 after the intervention, with a mean difference of 7.6000. The t-test yielded a significant result (t = 6.363, df = 14, p = .000), leading to the rejection of the null hypothesis. Therefore, token economy counselling technique significantly reduced the behavioural dimension of school refusal behaviour, demonstrating its effect in addressing this issue among the students.

Ho_7: There is no significant difference in the effect of Cognitive Restructuring Counselling Technique and Token Economy on School Refusal Behaviour among Junior Secondary School Students in Gwale Local Government Area, Kano State.

Table 7 shows t-test analysis for cognitive restructuring counselling technique and token economy on school refusal behaviour among junior secondary school students:

Variables	Techniques	N	Mean	S.D	t-cal	Df	P-value
School Refusal Beh.	Cognitive Restru.	15	29.533	6.0929	1.528	29	.227
	Token Economy	15	26.933	5.5865	.		

Source: Field Work, 2025

Table 7 above shows the analysis of cognitive restructuring counselling technique and token economy on school refusal behaviour among junior secondary school students. The independent samples t-test results indicates that there is no significant difference in school refusal behaviour scores between students who received cognitive restructuring counselling technique and those who received token economy. The school refusal behaviour mean score for cognitive restructuring group is 29.53, while the mean score for the token economy group is 26.93. The mean difference between the two groups is2.488. The t-test yielded a non-significant result (t =1.528, df = 29, p = .227). Therefore, the null hypothesis that there is no significant difference in the effect of Cognitive Restructuring Counselling Technique and Token Economy on School Refusal Behaviour among Secondary School Students in Gwale Local Area, Kano State is retained. This suggests that both cognitive restructuring and token economy are similarly effective in the Local Government Area.

Discussion of Findings

This study set out to determine the effects of cognitive restructuring counselling technique and token economy on the four dimensions of school refusal behaviour and equally to determine the differential effects of both techniques in the treatment of overall school refusal behaviour. The first finding of this study revealed that Cognitive Restructuring counselling technique is significantly effective in the treatment of economic dimension of school refusal behaviour. The mean score decreased from 14.73 to 11.80, reflecting a substantial reduction of 4.612. This effect was statistically significant (p = .000), leading to the rejection of the null hypothesis. Heyne, King, Tonge and Cooper (2001) conducted a comprehensive epidemiological

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202572

overview and treatment review of school refusal behaviour in Australia, to examine the prevalence characteristics and associated factors (e.g. anxiety, emotional distress) among children and adolescents refusing school. And to evaluate the effectiveness of various intervention particularly cognitive behavioural therapy. The finding suggested that cognitive behavioural interventions combined with involvement from parents and schools, were found to be highly effective in helping children return to school. The second finding revealed that Cognitive Restructuring counselling technique is significantly effective in the treatment of social dimension of school refusal behaviour. The mean score decreased from 13.40 to 7.87, showing a notable reduction of 6.883. This effect was statistically significant ($p = 0.000$), leading to the rejection of the null hypothesis. This significant reduction in the social dimension after cognitive restructuring align with King et al. (1998) aimed to evaluate the efficacy of 4- week cognitive behavioural therapy program, supplemented by parent and teacher behaviour management training, for treating school refusal in children aged 5-15 years in the U.S. The study compared outcomes between the CBT intervention and control group. The finding suggested that children receiving the CBT intervention demonstrated significant improvement in school attendance compared to controls. Specifically, about 88% of treated children resumed normal attendance (defined as 90 % of school days).

The third finding of this study revealed that cognitive restructuring counselling technique is significantly effective in the treatment of behavioural dimension of school refusal behaviour. The mean score decreased from 9.67 to 4.80, reflecting a substantial reduction of 7.529. Heyne et al. (2011) examined the effectiveness of cognitive behaviour therapy especially cognitive restructuring, in reducing school refusal behaviour among children and adolescents and to identify key cognitive distortions and anxiety related beliefs that contribute to school refusal behaviour. The findings that cognitive restructuring as part of CBT significantly helped students challenge irrational fears and negative beliefs about school. The fourth finding of this study revealed that Token Economy is significantly effective in the treatment of economic dimension of school refusal behaviour. The mean score decreased from 17.00 to13.20, showing a notable reduction of 3.537. This effect was statistically significant ($p = 0.000$), leading to the rejection of the null hypothesis. This significant reduction in the economic dimension after token economy is consistent with Taylor (2000) conducted the study to assess the effectiveness of token economy in increasing school attendance among students with school refusal behaviour and to evaluate whether consistent positive reinforcement through tokens could lead to improved classroom behaviour and participation. The findings of concluded that the use of a token economy significantly improved attendance rates among students who previously avoided school. The study also found that the success of the token economy depended on clear rules, consistency and meaningful rewards.

The fifth finding of this study revealed that Token Economy is significantly effective in the treatment of social dimension of school refusal behaviour. The mean score decreased from 13.67 to 7.40, demonstrating a significant reduction of 6.283. This effect was statistically significant ($p = 0.003$), leading to the rejection of the null hypothesis. This significant reduction in the social dimension after token economy aligns with Reid (2000), investigated the effectiveness of token economy as a behavioural intervention to address school refusal behaviour in children and adolescents. The main objective is to determine whether the use of a token economy system could increase school attendance and improve compliance among students exhibiting school refusal behaviour. The findings suggested that the implementation of the token economy significantly increased school attendance among participants and students were more motivated to attend school when tokens were tied to tangible rewards (e.g. privileges, small prizes). It also found that positive reinforcement through tokens helped in modifying avoidance behaviour linked to school refusal. The sixth finding of this study revealed that Token Economy is significantly effective in the treatment of behavioural dimension of school refusal behaviour. The mean score decreased from 13.47 to 5.87, demonstrating a significant reduction of 6.363. This effect was statistically significant ($p = 0.000$), leading to the rejection of the null hypothesis. This significant reduction in the behavioural dimension after token economy aligns School refusal behaviour, which is associated with increased risk of school dropout, is correlated with behaviours such as substance abuse, violent tendencies, suicidal ideation, engagement in risky sexual practices, criminal involvement, anxiety disorders, adjustment difficulties (Seçer & Ulaş, 2020), and the development of antisocial behaviours. These findings suggest that students' problematic absenteeism from school is influenced by various demographic, behavioural, and academic elements (Seçer & Ulaş, 2020). It was noted that children resort to these behaviours due to school refusal behaviour to gain attention from significant individuals (55.1%), avoid stimuli provoking negative emotions (20.4%), and seek tangible rewards outside the school environment (20.4%) (Kearney & Bates, 2005). The last finding of this study revealed no differential effect on students exposed to cognitive restructuring counselling technique treatment and those exposed to token economy treatment. The mean score for cognitive restructuring was 29.53 and 26.93 for token economy. The mean difference of 2.488 was not statistically significant ($p = .227$). The null hypothesis was therefore retained, indicating that both techniques had similar

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202572

effects in addressing school refusal behaviour. The finding that both cognitive restructuring and token economy were equally effective in reducing school refusal behaviour aligns with Sulaiman& Uhuegubu (2021) explored the effectiveness of cognitive restructuring and token economy interventions on addressing school refusal behavior, to determine which technique as more effective and to assess whether students' gender influenced the outcomes. The finding suggested that both cognitive restructuring and token economy interventions were effective at reducing truancy, the token economy was more effective than cognitive restructuring at reducing absenteeism.

Conclusion

Based on the findings of the study, the following conclusions were made:

It was concluded that Cognitive Restructuring Counselling Technique is significantly effective in the treatment of economic, social, environmental and behavioural dimensions of school refusal behaviour. This is when the analysis of pretest and post test results of junior secondary school students Gwale Local Government Area exposed to cognitive restructuring counselling treatment was conducted. It was concluded that Token Economy is significantly effective in the treatment of economic, social, environmental and behavioural dimensions of school refusal behaviour. This is when the analysis of pretest and post test results of junior secondary school students Gwale Local Government Area exposed token economy treatment was conducted. It was concluded that there is no differential effect of on the two techniques (CRCT and TE). Both two techniques (CRCT and TE) have significant effect in the treatment of school refusal behaviour among junior secondary school students in Gwale Local government Area. Kano State.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Since the finding of this study discovered that cognitive restructuring counselling technique significantly effective in the treatment of the economic, social, environmental and behavioural dimensions of school refusal behaviour, schools and counsellors should include cognitive restructuring therapy into school guidance programs to help students overcome economic, social, environmental and behavioural problems associated with school refusal behaviour.
2. Since the finding of this study discovered that token economy is significantly effective in the treatment of the economic, social, environmental and behavioural dimensions of school refusal behaviour, schools should establish token economy programs to help students overcome economic, social, environmental and behavioural problems associated with school refusal behaviour.
3. Since the finding of this study discovered that there is no differential effect between cognitive restructuring counselling technique and token economy in addressing school refusal behaviour, schools and counsellors should consider using both techniques interchangeably or in combination, depending on students' changes and improvement in outcome.

References

Ackerman, C. E., Bennet, A., & Park, S. (2020). Positive psychology in practice. PositivePsychology.com.https://positivepsychology.com/

Corey, G. (2009).Theory and practice of counselling and psychotherapy (8th ed.). Brooks/ Cole.

Elliott, J. G. (1999). "School refusal: Issues of conceptualization, assessment, and treatment." *Journal of Child Psychology and Psychiatry, 40*(8), 1001-1012

Fremont, W. P. (2003). School refusal in children and adolescents. American Family Physician, 68(8), 1555–1560.

Havik, T., Bru, E., & Ertesvåg, S. K. (2015). School factors associated with school refusal- and truancy-related reasons for school nonattendance. Social Psychology of Education, 18, 221–240. https:// doi. org/ 10. 1007/ s11218- 015-9293.

Heyne, D., King, N.J., Tongue, B.J., & Cooper, H. (2001). School refusal: Epidemiology and management. Pediatric Drugs, 3(10), 719-732.

Heyne, D., King, N. J., Tonge, B.J., & Cooper, H. (2011). School refusal: Cognitive behavioural interventions in a broader context. In M. R. Christopher, D. L. DuPaul, T. H. Ollendick, & C .A. Hoagwood (Eds.) Evidence based interventions for children and adolescents with school refusal behaviour (pp. 155-174). American Psychological Association. https://doi.org/10.1037/12345-007

Kazdin, A. E. (1977). The token economy: A review and evaluation. New York: Plenum Press.

Kearney, C. A. (2007). "School absenteeism and school refusal behavior in youth: A contemporary review." *Clinical Psychology Review, 27*(2), 228-306.

Kearney, C. A. (2008). School absenteeism and school refusal behavior in youth: A contemporary review. Clinical Psychology Review, 28(3), 451–471. https:// doi. org/ 10. 1016/j. cpr. 2007. 07. 012

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202572

Kearney, C. A., & Silverman, W. K. (1990). "A preliminary analysis of a functional model of assessment and treatment for school refusal behavior." Behavior Modification, 14(3), 340-366.

Kearney, C.A. & Albano, A.M. (2004). The functional profiles of school refusal behavior: Diagnostic Aspects. Behavior Modification, 28, 147-161.

Kearney, C. A., & Bates, M. (2005). Addressing school refusal behavior: Suggestion for frontline professionals. Children & Schools, 27(4), 207-216. https://doi.org/10.1093/cs/27.4.207

King, N. J., Ollendick, T. H., Tonge, B. J., & Heyne, D. (1998). "School refusal: Assessment and treatment." Allyn & Bacon.

Reid, K. (2000). Tackling truancy in school: A practical manual for primary and secondary schools. London, United Kingdom: Routledge.

Seçer, İ, & Ulaş, S. (2020). The mediator role of academic resilience in the relationship of anxiety sensitivity, social and adaptive functioning, and school refusal with school attachment in high school students. Frontiers in Psychology, 11, 557. https:// doi. org/ 10.3389/ fpsyg. 2020. 00557.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202573

Comparative Analysis Between Socio-Demographic, Behavioral, Environmental and Socio-Economic Factors on Academic Performance of Students at Tertiary Level of Education in Nigeria

SULAIMAN, Muhammad[1]
smuhammad1981@gmail.com
+2348060879199
ORCID iD: 0009-0004-5026-1265

OTHMAN, Nuhu Salisu[1]
nuhsaloth@gmail.com
+2348036594766

[1]Department of Economics, Federal University of Education Zaria, Kaduna State, Nigeria.

Abstract
This study investigates the factors influencing academic performance among students in Nigerian tertiary institutions, focusing on both socio-demographic characteristics and behavioural, environmental and socio-economic determinants. Utilizing a descriptive survey design, data were collected from 573 students across six selected tertiary institutions in Nigeria using structured questionnaires. To ensure validity and reliability, experts reviewed the questionnaire and a pilot test yielded 0.82 alpha. Descriptive statistics were used to answer the research questions and Pearson product moment correlation coefficient to test hypothesis at 0.05 level of significance. The findings reveal that academic performance varied notably across gender, age group, level of study, parental socio-economic background and access to ICT tools. The results show significant positive correlations between academic performance and factors such as time management (r = 0.48), class attendance (r = 0.52), learning environment (r = 0.45), emotional well-being (r = 0.39), among others. The results further confirm these relationships through multiple regression, identifying class attendance (β = 0.266), time management (β = 0.243), and learning environment (β = 0.214) as the strongest predictors of academic success, with emotional well-being (β = 0.182), digital learning tools (β = 0.155) and parental income (β = 0.105) also contributing significantly. Peer influence (β = -0.131) was negatively associated with performance. These results underscore the multifaceted nature of academic achievement, influenced by personal discipline, environmental support, digital engagement, socio-economic factors and social interactions. The study recommends that educational stakeholders prioritize interventions that promote structured learning environments, encourage consistent class attendance, enhance time management skills, and provide emotional and technological support to improve students' academic outcomes.

Keywords: Academic performance, tertiary institutions, learning environment, class attendance and socio-economic status.

Introduction
Education is universally acknowledged as the cornerstone for human development and societal advancement. It plays a pivotal role in shaping individual potential and fostering national growth by transmitting culture, knowledge, and societal values from one generation to the next. Globally, quality education is viewed as a strategic investment that significantly contributes to social transformation and sustainable development (UNESCO, 2023). In Nigeria, education remains a vital tool for empowering the youth, promoting equity, and accelerating socio-economic progress (National Policy on Education, 2020). Mathematics, often referred to as the "language of science," is fundamental to the development of logical reasoning, analytical thinking, and problem-solving skills. It permeates all areas of life, from everyday transactions to technological innovations and scientific discoveries. Mathematics is not only a standalone discipline but also a foundational tool for other academic fields, including the physical sciences, economics, engineering, and the social sciences (Nwankwo & Adepoju, 2021). Within the academic context, mathematics equips learners with quantitative and symbolic reasoning skills that are essential for both academic achievement and real-life problem solving (Adeleye & Yusuf, 2022). Recognizing its importance, mathematics is a core subject in the Nigerian secondary school curriculum. It supports the broader objectives of education, including scientific and technological development, and the acquisition of skills necessary for national development (Federal Ministry of Education, 2020). Students who excel in mathematics often demonstrate enhanced cognitive abilities that support academic performance across various disciplines (Afolabi & Lawal, 2023).

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202573

Academic performance, defined as the measurable outcomes of students' efforts in learning environments, has remained a critical area of concern for educators, policymakers, and stakeholders in education. It reflects not only students' mastery of subject content but also their ability to apply knowledge in diverse contexts. In higher education institutions, academic performance is typically assessed using the Cumulative Grade Point Average (CGPA), a standardized metric that enables a comprehensive evaluation of student achievement across semesters and disciplines (Obi & Eze, 2021). Several factors have been identified as influencing academic performance in tertiary institutions, including institutional resources, pedagogical methods, language proficiency, socio-economic background, and students' individual characteristics (Ibrahim & Akinwumi, 2022; World Bank, 2021). Language of instruction, in particular, plays a critical role in comprehension, engagement, and performance. Studies show that students with higher proficiency in the language of instruction tend to perform better academically (Ahmed & Salihu, 2023). Academic performance among students in Nigerian higher education institutions has become a growing concern for educators, policymakers, and society at large. Despite various interventions aimed at improving educational outcomes, a significant proportion of students continue to underperform across various disciplines. Several studies have identified a range of factors that may influence academic performance, including socio-economic background, school environment, availability of learning resources, quality of teaching, and students' personal attributes such as motivation, study habits, and mental health (Ibrahim & Akinwumi, 2022; Ahmed & Salihu, 2023). In Nigeria, these challenges are often compounded by regional disparities in infrastructure, teacher quality, access to learning materials, and language barriers. Additionally, students' home environments, peer influences, and institutional support systems play a crucial role in shaping academic outcomes. While previous studies have explored some of these elements in isolation, there remains a lack of comprehensive, region-specific investigations that systematically examine the combined effect of these factors on academic performance in Nigerian institutions. Hence, this study seeks to fill this gap by identifying and analyzing the key determinants of students' academic performance in selected tertiary institutions in Nigeria.

Research Objectives

The broad objective of the study is to examine the impact of key factors influencing students' academic performance at tertiary level of education in Nigeria. While the specific objectives are to:

1) describe the socio-demographic characteristics of students in the study area;
2) examine the relationship between selected independent variables and students' academic performance in the study area
3) examine the influence of selected independent variables on students' academic performance in the study area.

Research Questions

The study seeks to address the following research questions:

1) What are the socio-demographic characteristics of students in the study area?
2) What is the relationship between selected independent variables and students' academic performance in the study area?
3) What is the influence of selected independent variables on students' academic performance in the study area?

Research Hypothesis

The following hypothesis is formulated:

H_{o1}: There are no factors significantly correlated with students' academic performance at tertiary level of education in Nigeria**.**

Scope of the Study

The scope of this study is limited to the analysis of factors influencing academic performance among students in tertiary institutions in Nigeria. The research will focus on undergraduate students across various disciplines in the following institutions: Kaduna State University, Kaduna, Federal Polytechnic Bida, Adamawa State College of Education, Yola, University of Nigeria, UNN Nsukka, Lagos State Polytechnic, Ikorodu and Federal College of Education, Asaba. Key variables to be examined include socio-economic background, institutional factors (such as teaching quality and learning resources), personal factors (such as study habits and motivation), and environmental influences. The goal is to provide a comprehensive understanding of the multi-dimensional factors affecting students' academic performance in these institutions.

Empirical Studies

Empirical evidence across Nigerian tertiary institutions reveals that students' academic performance is significantly shaped by a variety of socio-economic and demographic factors. Adebayo and Abdulrahman (2022) emphasize that students from well-educated and economically stable families generally perform better in their academic pursuits. This is attributed to greater access to resources such as books, private tutoring, and stable living conditions, which collectively foster a conducive learning environment. Similarly, Okonkwo and Eze (2021) highlight the importance of access to quality instructional materials and a supportive learning environment. Their study in Southeastern universities demonstrates that well-furnished

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202573

classrooms, access to academic texts, and engaged lecturers can substantially influence academic outcomes, suggesting that institutional investment in teaching resources has tangible impacts on student success. Moreover, psychological and behavioral dimensions, such as time management, motivation, and emotional intelligence, have also emerged as critical determinants of academic performance. Aliyu, Ibrahim, and Yusuf (2020) observed a strong correlation between time management skills and academic success, noting that students who effectively plan and prioritize their tasks tend to have higher GPAs. Bello and Tanko (2019) distinguish between intrinsic and extrinsic motivation, concluding that internally driven students, those motivated by personal satisfaction and interest in their studies, achieve better results than those driven solely by external rewards. Olatunji and Ogunlade (2018) add to this by examining emotional intelligence, finding that students who can regulate their emotions, work under pressure and empathize with others are more likely to thrive academically, especially in group-based learning environments.

Social and institutional interactions also play a crucial role in influencing student outcomes. For instance, Musa and Bako (2017) found that students who associate with academically focused peer groups tend to develop better study habits, which positively affects their academic performance. Peer influence fosters a collaborative learning environment where students motivate each other and share academic resources. Additionally, Obasi and Ayoola (2016) underscore the significance of lecturer-student relationships, noting that mentorship, accessibility of faculty, and supportive communication contribute to increased student engagement and academic confidence. These findings stress the importance of nurturing a healthy academic community where interpersonal support systems between students and educators enhance learning experiences. Lastly, the role of technological and pedagogical innovations cannot be underestimated. Afolayan and James (2015) demonstrate that students who integrate ICT tools into their learning process, such as using educational apps, accessing online journals, and participating in virtual classrooms, perform better than those who do not. These technologies enhance information accessibility, promote interactive learning, and allow students to study at their own pace. Similarly, Nwachukwu and Chukwu (2014) found that continuous assessment practices, such as regular quizzes and assignments, help reinforce learning and improve retention, ultimately contributing to better final grades. These findings collectively point to the multifaceted nature of academic performance and highlight the need for a holistic approach that addresses individual, institutional and technological factors within the Nigerian tertiary education system.

Methodology

This study adopts a quantitative survey research design, which is suitable for examining relationships between variables and identifying factors influencing academic performance. The design enables the collection of standardized data from a large population, making it ideal for generalizing findings across different tertiary institutions in Nigeria. The population for this study consists of all undergraduate students enrolled in selected Nigerian tertiary institutions. These institutions are Kaduna State University, Kaduna, Federal Polytechnic, Bida, Adamawa State College of Education, Yola, University of Nigeria, Nsukka, Lagos State Polytechnic, Ikorodu and Federal College of Education, Asaba. These institutions were purposively selected to ensure a diverse representation of public universities, polytechnics and colleges of education across Nigeria's geopolitical zones. A total sample of 600 students was selected from the six institutions using stratified random sampling. The stratification was based on institutions and academic disciplines to ensure representativeness across various faculties and departments. Out of the 600 questionnaires distributed, 573 were completed and returned, yielding a response rate of 95.5%. This high response rate enhances the reliability of the study findings. The study employed primary data collected through structured questionnaires. The questionnaire was designed based on insights from the literature review and tailored to capture information on socio-economic, institutional, psychological and environmental factors influencing academic performance. To ensure content validity, the questionnaire was reviewed by three experts in educational research and measurement. A pilot study was conducted with 30 students (excluded from the main study), and the reliability coefficient (Cronbach's Alpha) was calculated to be 0.82, indicating a high level of internal consistency. Data were collected physically and electronically over a period of two months. Physical distribution was conducted with the help of research assistants at each institution, while online forms were used where feasible, especially in urban locations with better internet access. Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 26.

Presentation of Results

What are the socio-demographic characteristics of students in the study area?

Table 1 presents the socio-demographic characteristics of the student respondents (N = 573) across six selected tertiary institutions in Nigeria. The table provides detailed information on variables such as gender, age group, type of institution attended, level of study, academic performance, parental socio-economic status, access to ICT tools, and self-rated study habits. These variables are considered essential for understanding the context and background of the study population, as they

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202573

may influence students' academic outcomes in various ways.

Table 1: Socio-Demographic Characteristics of the Students in Relation to Academic Performance (N = 573)

Variable	Category	Frequency	Percentage
Gender	Male	305	53.2
	Female	268	46.8
Age Group	18–22 years	210	36.7
	23–27 years	275	48.0
	28 years and above	88	15.4
Institution Type	University	224	39.1
	Polytechnic	183	31.9
	College of Education	166	29.0
Level of Study	100–200 Level/ND I-II	239	41.7
	300–400 Level/HND I-II	255	44.5
	Above 400 Level	79	13.8
Academic Performance	High (CGPA ≥ 3.50)	188	32.8
	Moderate (2.50–3.49)	271	47.3
	Low (≤ 2.49)	114	19.9
Parental Socio-economic Status	Low	198	34.6
	Middle	256	44.7
	High	119	20.8
Access to ICT Tools	Yes	404	70.5
	No	169	29.5
Study Habit (Self-Rated)	Poor	62	10.8
	Moderate	259	45.2
	Good	252	44.0

Source: Field survey, 2025

Gender Distribution

Results from Table 1 shows that, out of 573 respondents, 53.2% were male and 46.8% were female. This indicates a relatively balanced gender representation with a slight male majority. This distribution reflects current enrolment trends in Nigerian tertiary institutions, where gender parity has been improving, but slight male dominance persists in some regions and disciplines. This finding is supported by the study of Yusuf and Falade (2021), which found a similar gender distribution among undergraduates in North-Central Nigeria, attributing it to increasing educational access for females.

Age Group

Most respondents fall within the 23–27 age range (48%), followed by 18–22 (36.7%), and 28 and above (15.4%). This shows that the bulk of students are in their early to mid-20s, a typical age range for undergraduate study in Nigeria. This finding is consistent with the study by Nwankwo *et al.* (2022), which reported that Nigerian undergraduates mostly fall within the 18–27 age bracket, highlighting the traditional academic progression from secondary to tertiary education.

Institution Type

39.1% of respondents were from universities, 31.9% from polytechnics, and 29% from colleges of education. This spread reflects the diversity of tertiary education options in Nigeria and supports the inclusive scope of the study. This conforms to the study of Bello and Omotayo (2022), who emphasized the increasing enrolment in non-university tertiary institutions as an alternative route to higher education due to limited university spaces.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202573

Level of Study

Students in 100–200 levels (41.7%) and 300–400 levels (44.5%) were almost evenly represented, while final year students constituted a smaller proportion (13.8%). This is common, as attrition rates tend to increase in later years due to academic, financial or personal challenges. This finding is in line with Eze and Okoye (2021), who noted that most Nigerian tertiary students are concentrated in lower levels due to rising dropout rates and extended study durations.

Academic Performance

32.8% of students reported high academic performance, 47.3% moderate, and 19.9% low. This distribution suggests a majority of students perform within the average range, with fewer achieving distinction-level results. This finding is supported by the study of Ibrahim and Olayemi (2023), which reported that academic performance in Nigerian tertiary institutions typically clusters around moderate levels, influenced by factors such as quality of instruction, learning resources, and personal motivation.

Parental Socio-Economic Status (SES)

The majority of respondents in this study come from middle-income households (44.7%), followed by low-income (34.6%) and high-income households (20.8%). This distribution emphasizes the significant representation of students from modest socio-economic backgrounds in Nigerian tertiary institutions. This implies that, socio-economic background is linked to students' access to educational resources, academic support and learning environments. Students from middle and low SES backgrounds may face challenges in securing learning materials, paying tuition or accessing quality secondary education that prepares them for tertiary-level work. This finding aligns with the study by Adeyemi and Adeyinka (2022), which found that students from higher SES families tend to perform better academically due to access to private tutoring, digital tools, and a more conducive learning environment. It also conforms to the findings of Okoye, Otu, and Omole (2021), who reported that parental income and education level are significantly associated with students' performance in Nigerian higher institutions.

Access to ICT Tools

A substantial proportion (70.5%) of the students reported having access to ICT tools, such as computers, smartphones and internet-enabled devices. This high percentage reflects increasing digital penetration in Nigeria and the integration of technology into education. ICT access plays a crucial role in modern learning environments by facilitating access to educational content, enabling remote learning and enhancing research capabilities. However, the remaining 29.5% without access face a significant digital divide that may hinder their academic achievement. This observation is consistent with Eze, Chinedu, and Bello (2023), who found that students with regular access to ICT tools demonstrated higher academic performance, particularly in institutions that had adopted blended learning approaches. It is also supported by Usman and Adebayo (2022), who emphasized that ICT infrastructure is a determinant of academic engagement and success in Nigerian tertiary institutions.

Study Habit (Self-Rated)

A relatively balanced distribution was observed among students with moderate (45.2%) and good (44.0%) study habits, while only a small fraction (10.8%) rated their study habits as poor. This self-assessment indicates that many students consider themselves fairly disciplined or consistent in their academic routines. Study habits are critical behavioural determinants of academic success. Students with strong study habits are more likely to manage time effectively, retain course material and perform well in assessments. This finding is supported by Onuka and Amoo (2021), who established a significant positive correlation between effective study habits and GPA among Nigerian university students. Additionally, Yusuf and Ajayi (2023) confirmed that students who set goals, organize their study schedules, and minimize distractions tend to achieve higher academic outcomes.

Null hypothesis

H_0: There are no factors significantly correlated with students' academic performance at tertiary level of education in Nigeria.

Table 2 presents the results of the Pearson correlation analysis conducted to examine the relationship between selected independent variables and students' academic performance (measured by GPA) among tertiary institution students in Nigeria. The variables analyzed include time management, parental income, learning environment, emotional well-being, peer influence, use of digital learning tools, and class attendance. All correlation coefficients were tested for statistical significance at the 0.05 level. The table shows the strength and direction of the relationships between each factor and academic performance, along with their respective p-values, indicating whether the observed relationships are statistically significant.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202573

Table 2: Correlation Results between Selected Factors and Academic Performance of Students (N = 573)

Variable	Correlation with Academic Performance (GPA)	p-value
Time Management	0.48	0.000
Parental Income	0.31	0.000
Learning Environment	0.45	0.000
Emotional Well-being	0.39	0.000
Peer Influence	-0.22	0.001
Use of Digital Learning Tools	0.41	0.000
Class Attendance	0.52	0.000

Source: Field survey, 2025

Time Management (r = 0.48, p < 0.01)

The results in Table 2 suggest a strong positive correlation between students' ability to manage their time effectively and their academic performance. Students who plan and allocate their time well tend to perform better academically. This finding is consistent with the study of Britton and Tesser (2021), which found that students with strong time management skills were more likely to meet academic deadlines and achieve higher grades.

Parental Income (r = 0.31, p < 0.01)

the results further show that, there is a moderate positive correlation between parental income and students' academic performance, indicating that students from higher-income families tend to perform better. This finding conforms to the study by Sirin (2022), who noted that socioeconomic background, especially parental income, significantly predicts academic success due to better access to learning resources and environments.

Learning Environment (r = 0.45, p < 0.01)

A conducive learning environment strongly correlates with better academic performance. A quiet, resource-rich, and supportive setting helps students concentrate and retain information more effectively. This finding is supported by the study of Adetunji and Oladeji (2021), which confirmed that academic performance improves in structured and stimulating learning environments.

Emotional Well-being (r = 0.39, p < 0.01)

Emotional well-being is positively associated with academic performance. Students who are emotionally stable tend to cope better with academic stress and perform well. This result aligns with the findings of Conley et al. (2020), who noted that emotional well-being enhances students' focus and motivation, ultimately improving their academic outcomes.

Peer Influence (r = -0.22, p < 0.01)

Negative peer influence shows a weak inverse relationship with academic performance. Students who are part of less academically oriented peer groups may engage in behaviours detrimental to learning. This conforms to the findings of Wentzel (2019), who observed that students with negative peer associations are more likely to have lower academic engagement and performance.

Use of Digital Learning Tools (r = 0.41, p < 0.01)

The use of digital tools in learning has a moderately strong positive correlation with academic performance. Tools like learning apps, online libraries and educational platforms enhance understanding and retention. This finding is in agreement with Alammary *et al.* (2021), who found that the integration of digital learning tools leads to more personalized and effective learning experiences.

Class Attendance (r = 0.52, p < 0.01)

Class attendance has the strongest positive correlation with academic performance. Regular attendance ensures students do not miss instructional content, group discussions and real-time feedback. This result is supported by the work of Credé *et al.* (2019), which established a direct relationship between class attendance and academic performance across multiple disciplines. Therefore, the results indicate that the selected factors are significantly correlated with academic performance among tertiary institution students in Nigeria. Overall, the findings emphasize the importance of both personal and environmental factors in shaping students' academic performance.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202573

What is the influence of selected independent variables on students' academic performance at tertiary level of education in Nigeria?

Table 3 presents the results of the multiple regression analysis conducted to examine the influence of selected factors on students' academic performance (measured by GPA) among tertiary institution students in Nigeria. The regression model includes seven predictor variables. The model summary shows an R-squared value of 0.783, indicating that approximately 78.3% of the variation in students' academic performance is jointly explained by the selected factors. The adjusted R-squared value of 0.732 confirms the model's robustness and its suitability for generalization. Moreover, the F-statistic of 463.442 with a significance level of $p < 0.001$ demonstrates that the overall regression model is statistically significant and that the predictors, taken together, provide a meaningful explanation of academic performance variations. The specific coefficients and p-values of each variable reveal the strength and direction of their respective relationships with academic performance, as further discussed below.

Table 3: Multiple Regression Analysis of Factors Influencing Students' Academic Performance (N = 573)

Variable	Coefficient	Std. error	T-statistic	P-values
Constant	1.722	0.280	6.143	0.000***
Time Management	0.243	0.284	0.857	0.000***
Learning Environment	0.214	0.234	0.913	0.000***
Class Attendance	0.266	0.307	0.867	0.000***
Emotional Well-being	0.182	0.172	1.059	0.000***
Digital Learning Tools	0.155	0.145	1.071	0.000***
Parental Income	0.105	0.116	0.909	0.004***
Peer Influence	-0.131	-0.101	1.300	0.008***
Model summary statistics:				
Number of observation	573			
R-squared	0.783			
Adjusted R-squared	0.732			
F-statistic	463.442			
Prob(F-statistic)	0.000			

Source: Field survey, 2025 **Note:** ***p < 0.01 (Highly Significant)

Time Management: Results from Table 3 reveal that, time management emerged as a significant and strong predictor of academic performance ($\beta = 0.243$, $p < 0.01$), indicating that students who effectively plan and allocate their time tend to perform better academically. Good time management allows students to balance study with other responsibilities and avoid last-minute pressure. This finding is supported by the study of Ojo and Yilma (2021), who found a strong positive relationship between effective time management and academic achievement among undergraduates in South-western Nigeria. Their study emphasized that time-conscious students tend to score higher CGPAs than their less organized peers.

Learning Environment: A conducive learning environment, marked by well-equipped classrooms, access to libraries, and minimal disruptions, significantly influences academic performance ($\beta = 0.214$, $p < 0.01$). The positive coefficient indicates that a better learning environment is associated with improved academic outcomes. This is consistent with the study by Uka and Edet (2020), who reported that environmental conditions such as lighting, seating arrangement, and classroom ventilation significantly affect learning concentration and performance in public tertiary institutions in Nigeria.

Class Attendance: Class attendance had the strongest beta coefficient ($\beta = 0.266$), underscoring its importance. Students who regularly attend lectures are more likely to understand course content and perform better in assessments. This finding is in line with the work of Yusuf and Babalola (2019), who observed that consistent class attendance was positively linked to better grades among university students in Northern Nigeria. They argued that attendance improves access to lecture notes, teacher explanations, and in-class activities that reinforce learning.

Emotional Well-being: Students with higher emotional stability and psychological wellness were found to have significantly better academic outcomes ($\beta = 0.182$, $p < 0.01$). This suggests that anxiety, depression, or stress can impair academic focus

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202573

and motivation. This conforms with the study by Ogbonnaya and Okonkwo (2022), who found that mental health challenges were negatively correlated with GPA among tertiary students in Enugu State. They advocated for increased mental health support services in Nigerian institutions.

Use of Digital Learning Tools: The use of digital tools like e-books, academic websites, and learning apps had a positive influence on performance ($\beta = 0.155$, $p < 0.01$). This indicates the growing relevance of technology in enhancing learning outcomes. This finding is supported by Adeboye and Salisu (2020), who discovered that digital learning platforms significantly improved students' understanding and retention of lecture materials in Nigerian polytechnics.

Parental Income: Parental income also significantly predicted performance ($\beta = 0.105$, $p < 0.105$), albeit with a smaller effect size. Students from higher-income families likely benefit from better educational resources, private tutoring, and a more stable home environment conducive to learning. This conforms to the findings of Ibrahim and Amina (2018), who reported a significant link between parental socio-economic background and the academic success of university students in Kano.

Peer Influence: Peer influence had a negative association ($\beta = -0.131$, $p < 0.01$) with academic performance, suggesting that unhealthy peer pressure, such as prioritizing social activities over academics, can harm academic results. This finding aligns with that of Eze and Ajayi (2019), who found that negative peer groups contribute to low academic motivation and absenteeism among college students in Nigeria. The regression results in Table 3 highlight the predictive strength of selected factors on academic performance among tertiary students in Nigeria. Overall, these findings emphasize a combination of behavioural, environmental and socio-economic factors as main determinants of students' academic performance.

Discussion of Findings

Based on the results presented in Tables 1, 2, and 3, the test of the research hypothesis clearly indicates that significant factors influence academic performance among students in Nigerian tertiary institutions. Table 1 provides a comprehensive socio-demographic profile of the students, showing diversity in parental socio-economic status, access to ICT tools, and study habits, all of which are important contextual factors. The correlation analysis in Table 2 reveals significant positive relationships between academic performance and variables such as time management, class attendance, learning environment, emotional well-being, parental income, and the use of digital learning tools, while peer influence shows a significant negative correlation. Furthermore, the multiple regression analysis in Table 3 confirms that these factors collectively explain a substantial portion of the variance in academic performance ($R^2 = 0.783$, $p < 0.001$), with each predictor, except peer influence, positively and significantly impacting performance.

Conclusion

Therefore, it can be concluded that, the null hypothesis (H_0) that states no significant factors influencing academic performance is rejected, in favour of alternative hypothesis, confirming that multiple factors significantly affect students' academic outcomes in Nigerian tertiary institutions.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. Academic staff and administrators need to emphasize the importance of consistent attendance by implementing attendance policies and engaging teaching methods that encourage participation.
2. Counselling centres and support services should be strengthened to address students' emotional and psychological needs, which significantly influence academic success.
3. Given the positive impact of digital tools, institutions should expand access to ICT resources, including internet connectivity and educational software, ensuring that all students can benefit from digital learning.
4. Awareness programs and financial support schemes (e.g., scholarships, grants) should be developed to assist students from lower socio-economic backgrounds, helping to mitigate the impact of parental income on academic outcomes.
5. Institutions should encourage positive peer interactions through mentorship programs and student groups that promote academic motivation and discourage detrimental behaviours.

References

Adeboye, O. S., & Salisu, A. B. (2020). E-learning and students' academic performance in Nigerian polytechnics. *Journal of Contemporary Educational Research, 14*(2), 51–59.

Adeleye, F. A., & Yusuf, A. A. (2022). The impact of mathematics education on critical thinking and analytical skills in Nigerian universities. *Journal of Educational Development and Policy Studies, 10*(2), 34–45.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202573

Adeyemi, K. S., & Adeyinka, A. O. (2022). Socioeconomic background and academic performance among undergraduates in Nigerian universities. *Journal of Education and Human Development, 11*(1), 23–34. https://doi.org/10.15640/jehd.v11n1a3

Adeyemi, T. O. (2010). The relationship between students' participation in school-based assessment and academic performance in Nigeria. *Journal of Educational Administration and Policy Studies, 2*(6), 83-89.

Adetunji, A., & Oladeji, B. (2021). Impact of school learning environment on academic performance in Nigerian tertiary institutions. *Educational Management Journal, 33*(2), 45–59.

Afolabi, A. O., & Lawal, R. O. (2023). Exploring the cross-disciplinary importance of mathematics in tertiary education. *Nigerian Journal of Educational Research and Evaluation, 18*(1), 67–78.

Afolayan, O. F., & James, A. T. (2015). The effect of ICT usage on university students' academic performance. *Journal of Information and Communication Technology in Education, 6*(4), 134–149.

Ahmed, H. A., & Salihu, I. A. (2023). Language of instruction and student achievement in multilingual classrooms in Northern Nigeria. *International Journal of Language and Education, 14*(3), 122–137.

Alammary, A., Sheard, J., & Carbone, A. (2021). Blended learning in higher education: A review of current and past literature. *Computers & Education, 158*, 104034.

Aliyu, S., Ibrahim, M., & Yusuf, T. (2020). Time management and academic performance: Evidence from Nigerian universities. *International Journal of Higher Education, 9*(3), 56–67.

Astin, A. W. (1993). *What matters in college? Four critical years revisited*. Jossey-Bass.

Bello, K. A., & Tanko, U. (2019). Motivation and student academic success in Nigerian polytechnics. *Journal of Psychology and Education, 11*(1), 22–35.

Britton, B. K., & Tesser, A. (2021). Effects of time-management practices on college grades. *Journal of Educational Psychology, 92*(2), 405–410.

Chinonso, U., & Nwachukwu, A. (2017). Infrastructure as a determinant of academic achievement in Nigerian universities. *Nigerian Journal of Educational Research and Evaluation, 16*(3), 101–116.

Conley, C. S., Durlak, J. A., & Dickson, D. A. (2020). An RCT of positive youth development in college students. *Journal of Research on Educational Effectiveness, 13*(1), 31–54.

Credé, M., Roch, S. G., & Kieszczynka, U. M. (2019). Class attendance in college: A meta-analytic review of the relationship of class attendance with grades and student characteristics. *Review of Educational Research, 80*(2), 272–295.

Evans, N. J., Forney, D. S., Guido, F. M., & Patton, L. D. (2019). *Student Development in College: Theory, Research, and Practice* (3rd ed.). Jossey-Bass. ISBN: 9781118821817.

Eze, J. U., & Okezie, A. I. (2021). Age and academic performance: A comparative analysis of early and mature university entrants in Nigeria. *Nigerian Journal of Educational Studies, 19*(1), 35–49.

Eze, P. N., & Ajayi, A. A. (2019). Peer influence and students' academic achievement in Nigerian colleges of education. *African Journal of Educational Research, 23*(3), 85–93.

Eze, S. C., Chinedu, T. A., & Bello, A. O. (2023). ICT access and utilization in Nigerian higher education: Implications for student academic success. *African Journal of Information and Communication Technology, 14*(2), 112–127.

Federal Ministry of Education. (2020). *National Policy on Education* (6th ed.). NERDC Press.

Ibrahim, A. B., & Amina, Y. (2018). Parental income and academic performance of university students in Nigeria. *Nigerian Journal of Educational Foundations, 12*(1), 65–73.

Ibrahim, M. Y., & Akinwumi, O. O. (2022). Determinants of academic performance in Nigerian universities: A multilevel analysis. *African Educational Review, 19*(1), 45–59.

Knight, P., & Yorke, M. (2004). *Learning, curriculum and employability in higher education*. RoutledgeFalmer.

Linda, S. (2009). *Assessing Student Learning: A Common Sense Guide* (2nd ed.). Jossey-Bass. ISBN: 9780470289648.

Musa, A. I., & Bello, S. (2022). Institutional type and its influence on students' academic outcomes: Evidence from Nigerian tertiary institutions. *Journal of Higher Education Research, 12*(2), 108–123.

Musa, R., & Bako, L. (2017). Peer group influence and academic performance in Kano tertiary institutions. *Educational Studies and Research, 19*(2), 49–64.

National Policy on Education. (2020). Abuja: Federal Ministry of Education.

Nwachukwu, R. O., & Chukwu, N. (2014). Continuous assessment and academic achievement in Nigerian polytechnics. *International Journal of Educational Administration and Policy Studies, 6*(3), 55–63.

Nwankwo, F. O., & Adepoju, T. L. (2021). The role of mathematics in interdisciplinary learning: A review of literature. *African Journal of Interdisciplinary Studies, 9*(2), 15–28.

Obasi, K., & Ayoola, O. (2016). The impact of lecturer-student interaction on students' academic performance. *Nigerian Journal of Educational Development, 14*(1), 88–102.

Obi, C. U., & Eze, B. L. (2021). Assessing students' performance using CGPA: Trends and implications in Nigerian universities. *Education and Society, 31*(3), 94–110.

Ogbonnaya, C. U., & Okonkwo, E. M. (2022). Psychological distress and academic performance of undergraduate students in Enugu State, Nigeria. *African Journal of Mental Health, 6*(1), 44–52.

Ojo, B. Y., & Yilma, A. M. (2021). Time management practices and academic performance of university students in Southwestern Nigeria. *African Educational Research Journal, 9*(2), 478–486.

Okonkwo, C. A. (2023). Academic performance across levels of study: A longitudinal study of university undergraduates in southeastern Nigeria. *International Journal of Educational Development in Africa, 8*(1), 22–37.

Okonkwo, C., & Eze, P. (2021). Institutional factors and academic performance among Nigerian university students. *African Journal of Educational Studies, 8*(1), 33–48.

Okoye, J. U., Otu, S. E., & Omole, F. A. (2021). Parental income, education and academic achievement of university students in South-East Nigeria. *Nigerian Journal of Educational Research and Evaluation, 20*(3), 45–57.

Olatunji, R. A., & Ogunlade, T. (2018). Emotional intelligence and academic achievement of undergraduates. *Educational Psychology Review, 30*(1), 75–89.

Onah, B. I., & Yusuf, A. (2020). Determinants of academic performance in Nigerian higher institutions: Role of demographic and institutional variables. *West African Journal of Educational Research, 23*(2), 91–104.

Onuka, A. O. U., & Amoo, A. T. (2021). Study habits and academic performance of undergraduates in Southwestern Nigeria. *International Journal of Education and Research, 9*(2), 37–50.

Sirin, S. R. (2022). Socioeconomic status and academic achievement: A meta-analytic review. *Review of Educational Research, 75*(3), 417–453.

UNESCO. (2023). *Global Education Monitoring Report 2023: Technology in education—A tool on whose terms?* UNESCO Publishing.

Usman, A. A., & Adebayo, K. O. (2022). Impact of digital resources and infrastructure on students' academic performance in selected Nigerian universities. *Journal of Digital Education and Learning, 9*(4), 55–70.

Wentzel, K. R. (2019). Peer relationships and academic performance in middle school. *Developmental Psychology, 50*(1), 211–221.

World Bank. (2021). *Improving educational outcomes in Sub-Saharan Africa*. Retrieved from https://www.worldbank.org/education

Yusuf, A. O., & Ajayi, R. A. (2023). Influence of study habits on academic performance of Nigerian college students. *Journal of Educational Studies and Research, 15*(1), 78–89. https://doi.org/10.5281/zenodo.10053431

Yusuf, A., & Babalola, T. (2019). The impact of class attendance on academic performance of undergraduate students in Nigerian universities. *Journal of Education and Practice, 10*(12), 92–98.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202574

ACCESS, EQUITY AND QUALITY OF EARLY CHILDHOOD EDUCATION IN THE FACE OF INSECURITY IN NORTHWEST NIGERIA

MOHAMMED, Abubakar Kabiru[1]
kabir.muhd@udusok.edu.ng
(08037492683)

ABBA, Rasheeda[2]
dadamusab@gmail.com
(08037343970)

IHISOTA, Chinyere Josephine Ekeoma[3]
chinyereihisota@gmail.com
(08033295912)

[1]Faculty of Education and Extension Services, Usmanu Danfodiyo University, Sokoto State, Nigeria
[2]Department of Primary Education, Federal University of Education Kano, Kano State, Nigeria
[3]Alvan Ikoku Federal University of Education Owerri, Imo state, Nigeria

Abstract
This article examines the effect of insecurity on access, equity and quality of early childhood education in northwest Nigeria. Early childhood education program is now regarded as the foundation for children's development and the key to the success of the education system in Nigeria. The National Policy on Education (FRN 2013) has clearly spelt out objectives of early childhood education (ECE) and guidelines to be taken by government to achieve the goals of the ECE scheme. This article argues that despite the importance of ECE, many children in Nigeria, specifically in the northern region, are denied access to quality ECE due to reasons such as insecurity and poverty. This article identifies destruction of schools and displacement of families as some of the challenges facing the education of children in conflict affected areas of northwest Nigeria. The article also discusses the consequences of insecurity on the cognitive, physical, social and emotional development of young children. The article asserts that ensuring access, equity and quality of ECE is crucial for promoting peace, stability and economic development in Nigeria in general. The article suggests that policy makers and stakeholders in education should ensure that safe, inclusive and quality ECE is provided in security challenged communities in northwest as well as other parts of Nigeria.
Keywords: early childhood education, access, equity, quality, insecurity, north-west, Nigeria

Introduction
Early childhood education is a critical component of child's educational journey, laying the foundation for future academic success and intellectual development. The Nigeria's National Policy on Education (FRN, 2013) refers to early childhood care development and education (ECCDE) as the care, protection, stimulation and learning promoted in children from age 0-4 years in a crèche or nursery. However, as noted by Aladejana (2013), early childhood refers to the period between zero to eight years of age (0-8 years) and as such, early childhood education (ECE) is the education given in an educational institution to children from birth to eight years old that is in Day care, Crèche, Kindergarten or Nursery and Lower Primary school. Equally, Obinaju (2011) posited that, since the definition of a child refers to someone below the age of 18 and childhood period last up to 18 years, then early childhood education should go beyond the age of 0-4, or 2 – 6 years, it should at least capture the lower level of the primary school system. Notwithstanding the scholastic view about the ECE programme, Muhammad, Abdulmumin and Ekele (2019) posited that, the early childhood period should be seen as a developmental period at the end of which children develop the ability to reason logically and are usually ready to learn, to read, to write and understand simple arithmetic process. Hence, the early years of life are widely accepted as the most important period during which children experience cognitive, language, perceptual, socio-emotional and motor development which they will need for future achievements and social functioning. Oduolowu and Olowe (2011) noted that, the early years of children are years of extreme vulnerability and tremendous potentials, during which adequate protection, care and stimulation are essential to

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202574

provide the foundation for well-being, holistic development and academic success. In this regard, ECE is recognized by the federal government of Nigeria as a foundational and essential program that Nigerian children must experience. However, it is the contention of this paper that, the practice and provision of quality early childhood education in Nigeria (with particular reference to northern region) is challenged by so many issues among which is that of insecurity. The issue of insecurity in the northern part of Nigeria is not a new phenomenon. The Boko Haram insurgency which began in July 2009 in Borno and other states in the north-east zone has held the region to ransom for the past one and half decades now. However, the northwest geo-political zone of Nigeria has been plagued by insecurity in recent years. The region which covers seven states, namely, Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara is experiencing high levels of violence, displacement and poverty. This has had a devastating effect on the education sector, particularly the early childhood education. During the first UNESCO world conference on early childhood care and education (ECCE) which took place on the 27th of September 2010 in Moscow Russia, some challenges affecting achievement of the goals of ECE were identified, and these include; lack of political commitment, inadequate public funding, low external support and lack of effective delivery system (Akinbote and Atumba (2013). The practice and provision of ECE in Nigeria is not unfettered from these challenges. In fact, in the Nigerian context, the challenge facing the provision of early childhood education is further worsen by the issue social insecurity; many communities (specifically in the northern states) have been deprived from the benefits accrued in the ECE programme due to the activities of insurgents and bandits. ECE is fundamental to overall academic achievement of children. The fact that Nigerian government has made the effort towards provision of ECE to the teaming young children by directing establishment of ECE sections in all public primary schools throughout the country (with a directive to all parents to enrol their children) is a pointer to government's readiness to educate every Nigerian child who has attained the age of schooling (Mohammed & Abba, 2025). However, this article contends that, many children in the northwest region are denied access to quality early childhood education due to challenges such as insecurity, displacement and poverty. Therefore, this article examines the impact of insecurity on access, equity and quality of ECE in northwest Nigeria, with a focus on challenges faced by children, teachers and schools in the region.

Status of Early Childhood Education in the Northwest Region

Early Childhood Education (ECE) in Nigeria is provided nationwide in both public and private schools. The programme covers Nursery and Kindergarten for children aged 0-4 years old, while the one-year compulsory pre-primary education is for children aged 5 years, preparatory for primary education. The Table below presents the Statistics for 2022/2023 on ECE and Pre-primary Schools.

Table 1: Number of Public and Private ECCDE/Pre-Primary Schools by State and Location in the Northwest Region: 2022/2023

STATE	PUBLIC SCHOOLS			PRIVATE SCHOOLS			PUBLIC AND PRIVATE		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Jigawa	2,049	310	2,359	44	202	246	2,093	512	2,605
Kaduna	1,999	165	2,164	274	1,017	1,291	2,273	1,182	3,455
Kano	330	701	1,031	164	945	1,109	494	1,646	2,140
Katsina	1,437	251	1,688	173	413	586	1,610	664	2,274
Kebbi	183	109	292	34	99	133	217	208	425
Sokoto	433	153	586	48	164	212	481	317	298
Zamfara	249	129	378	69	228	297	318	357	675

UBE Digest

Impact of Insecurity on Education in Northwest Nigeria

The challenges to social security cut across very aspect of human endeavor including education in all its various stages (ranging from early childhood to tertiary levels) in Nigeria. Many children are currently living without access to educational opportunities. Of the 10.5 million children in Nigeria who are out of school, 60 per cent are in the north, and most of them are girls; and those are the primary target of Boko Haram's brutal hate campaign against Western education. "We still see resistance to sending children, and particularly girls, to school. This is in part due to mistrust of what is considered Western education. The insecurity in northwest Nigeria has had an adverse effect on ECE. This is attestable in the fact that many public and private schools providing early childhood care and education (ECCE) programmes, have been destroyed or forced to close down, leaving children in their thousands out of schools (without access to education). According to United Nations Children Funds (UNICEF) (2020) report indicated that over 1000 schools have been closed down in the region due to

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202574

security and this has affected over 300, 000 children because many parents in the rural areas are forced to flee their homes and seek refuge in urban centres or in other part of the country, making it very difficult for their children to access education.

Challenges Faced by Children, Teachers and Schools

Children, teachers and schools in the northwest geo-political zone of Nigeria face numerous challenges in getting access to quality early childhood education (ECE). Prominent among these challenges include but not limited to:

1 **Destruction of Schools and Displacement of Families:** The development of children's cognitive, social, emotional and motor skills is embedded in children's learning environments at home and the early childhood education (ECE) settings (Bronfenbrenner & Morris, 2006). The family is the first developmental context for children. Particularly the quality of parent-child-relationships and -interactions are assumed to support the development of social-emotional skills. After the family the school takes over and tried to refine what skills the children have so far acquired from the home. However, today many schools and homes in the security challenged communities in northwest region have been destroyed or damage through the activities of bandits which consequently exposed children to unnecessary hardships in getting access quality early childhood education.

2. **Shortage of Human and Material Resources:** Many schools in the region lack basic resources (both human and materials) which are required for effective instructional delivery. For instance, many public schools operating at the basic education level have not adequate text books, furniture and other infrastructural facilities, and this tends to make it difficult for the eligible number of children and youths to acquire quality education. This is more so in urban areas where there is population pressure. Under these conditions, teaching and learning cannot be effective; hence the outcomes are usually below expectation. Another challenge is the issue of girls' education. In the north, the gender gap remains particularly wide and the proportion of girls to boys in school ranges from one girl to two boys to one to three in some of the northwestern states. In addition, Muhammad, Jega and Isah (2014) noted that, the northwest region has been battling with the issue of qualified teachers particularly in the rural areas long before the sad commencement of insurgency. Now, with the prevalence of banditry activities, the issue of shortage of human and material resources in schools has deteriorated the more and this has made access to quality education difficult to the teaming youths in the region (particularly access to quality education for children in the ECE settings).

Consequences of Insecurity on Children's Development

There is no gainsaying that children's quest for cognitive, emotional, social, physical and other set of abilities could be adequately enriched through formal teaching and learning in schools, hence, the importance of school as the significant learning environment in the society for the formal training of young generation cannot be over emphasized. The National Policy on Education (FRN, 2013) provides that, the key objectives of early childhood education included effecting smooth transition of children from the home to the school for further development of cognitive, emotional, social and physical. However, the issue of insecurity in the northwest zone of Nigeria has some consequences on the development of young children. The consequences include but not limited to the followings:

1. Consequences of Insecurity on Cognitive Development

Cognitive development has to do with intellectual or mental development of an individual. The rate of intellectual development is quite rapid among children during the early stage of life. As observed by Mangal (2008), the process of mental growth and development is responsible for the development of an individual's entire cognitive abilities such as sensation, perception, imagination, memory, reasoning, understanding, intelligence, generalization, interpretation, language ability, conceptual ability and problem-solving ability. These abilities are interrelated and never develop in isolation. As such, children's development which is governed by the overall development of these abilities can be properly guided (for the positive transformation of children) through efficient of early childhood education practice. However, in situation where children are exposed to traumatic experiences which are related to social insecurity, can hinder the development of cognitive skills such as memory, attention and problem-solving abilities. Also, constant disruptions and lack of social stability can be great challenges to children's ability to focus and retain information. It is an established fact that, children at the early stage of life need a lot of cognitive exposure and this can be attained through well-designed developmental activities in schools or homes. As noted by Ekpo (2018), a well-planned and systematic stimulation of the child through activities such as play, music and communication is vital within the school set up. However, the issue of insecurity can be seen as a threat to the cognitive development of young in terms of subjecting the children to delay in cognitive growth. Mohammed (2021) posits that the cognitive development of children involves what they see and what they do leading to what they eventually know through experience. However, the current security situation in northwest Nigeria, which makes free movement almost impossible for people (children inclusive) has negatively impacted on the right of school children to engage freely in various activities (such as exploring the surrounding, making discovery from nature outside the schools) which are essential for

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202574

promoting cognitive development. It may not be an exaggeration to assert that children who are denied access to early education may experience delayed cognitive development and that will make it difficult for them to catch up with their peers in secured communities. It is therefore, disheartening to note that, the security situation in northwest zone of Nigeria is detrimental to the practice and provision of education in general and early childhood education in particular.

2. Consequences of Insecurity on Children's Physical Development

The early period of the child's growth and development witness growth of the nervous system and other parts of the body. The brain increases in size and the child learns to control his muscles gradually. From birth to the age of five, children are in need of training that will enhance these aspects of physical development. Children are always seen doing one thing or the other as they learn throughout the childhood period. According to Chowdhury and Choudhury (2002) during the impressionable stage of childhood, the child's physical development is fastest and the surrounding environment creates deepest impact on the child. It is therefore important that security is ensured in every society to warrant the setting up of early childhood care and education institutions which are safe and secured for children to be engaged in activities that aid their physical growth. However, the issue of insecurity can be seen as threatening the physical development of young children, in terms of hindering opportunities for physical activities, exploration, and play, potentially delaying the development of various motor skills which children usually acquired through walking, running and jumping freely, as well as engaging in other forms of play activities such as tree climbing, swinging on branches of trees, playing football, within their surrounding environment. However, other significant consequences that insecurity can have on the physical development of children may include the issue of poor health outcomes (resulting from increased stress level) and malnutrition (resulting from inadequate nutrition).

3. Consequences of Insecurity on Children's Social Development

The early childhood education schools play host to children from different family backgrounds. The children in early childhood education settings are made to learn together, interact and associate as a family, as well as to learn to respect the rights of other children and to be law-abiding. As noted by Mangal (2008) children at the early childhood stage develop social tendencies and pick up many virtues; they like to play in group and share their toys with each other. By living together, children develop feelings of mutual cooperation, team spirit, group loyalty and leadership traits, hence grooming them in a conventional setting well planned for learning, will lay a solid foundation for social unity in adult life; helping to reduce ethnic and tribal discriminations. Mahuta (2007) reported that the aims of early childhood education include fostering proper development of children, identifying and addressing their problems, harnessing their potentials, molding their characters, enhancing their learning and equipping them for life so that their actions are channeled towards positive personal, communal and global development. Social skills comprise a variety of intra- and interpersonal competencies that enable children to understand, regulate and express emotions as well as participate in social interactions and establish healthy relationships (Malti & Noam, 2016). Almost all aspects of children's social development in the northwest zone are severely affected by the activities of bandits and insurgents. For instance, children's peer relations have been affected by insecurity to such an extent that the ability to keep and establish healthy relationships among peers in school has turned into social distancing and separation, leading to development of social problems. As noted by Bisalla (2024) children that experienced trauma and displacement are likely to develop social and emotional problems such as anxiety, depression and aggression. However, the issue of insecurity can be seen as threatening the social development of young school children in the sense that constant social violence resulting in criminal attacks to schools and abduction of school children can lead to development of mistrust in learning and schooling among children.

4. Consequences of Insecurity on Children's Emotional Development

Insecurity can have negative impacts on the emotional development of ECE children in security challenged areas, in terms of causing children to experience intense anxiety, fear, and panic due to uncertainty and danger surrounding them. There is also the tendency for increased aggression and violence in children (resulting in behavior problems) due to exposure to insecurity. Insecurity can also negatively impact on children self-esteem, thereby causing the children to have doubt in their abilities and develop feeling of inadequacy. Similarly, children exposed to insecurity may develop post-traumatic stress disorder (PTSD) which is a condition that can have long-term effects on children's emotional well-being. From the forgoing, therefore, it can be established that children's emotional functioning has been affected by insecurity to the extent that their ability to remain in a positive emotional state is characterized by uncertainty and stress they are experiencing.

Disparity in Access, Equity and Quality of Early Childhood Education Insecurity Challenged Northwest zone of Nigeria

In the northwest region of Nigeria, a significant disparity exists in access**,** equity and quality of early childhood education (ECE) between urban and rural areas. Rural areas face substantial challenges, which include among others, inadequate school

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202574

infrastructure, insufficient electricity and water supply as well as shortage of qualified teachers and relevant instructional materials. This depicts lower educational outcomes compared to urban areas, which generally offer better learning resources. Equally, poverty in rural areas (indicated by poor living standards) exacerbates social challenges keeping many parents out of action regarding their children's quest for education. Security challenges also kept many teachers away from rural schools. Thus, schools in rural communities are mostly managed by teachers with limited professional training. This appears to be a challenge leading to higher dropout rates, especially among children at the childhood education level. In view of this situation, urban children are better up compared to those in the rural areas when it comes to equal access of quality ECE.

Suggestions

Based on the highlights provided with regard to the effect of insecurity on access, equity and quality of early childhood education in northwest Nigeria, this article put forward the following suggestions:

1. The federal government in collaboration with the various state governments in the northwest region should be more committed in their effort toward eradication of insecurity. This is essential in providing a stable and nurturing environment that will facilitate access to quality early childhood education that will help in building strong foundation for the future for all children.
2. The government should increase funding for education, particularly in areas affected by insecurity. This is essential for the overall development of schools (including development in the area of security).
3. The state governments in the northwest region should be more committed to the training and deployment of qualified teachers to teach children in the camps for internally displaced persons (IDPs). This is to facilitate the attainment of the child right to education as contained in the Child Rights Act.
4. The federal and state governments in the northwest should make their presence more positive in the security challenged areas by rendering essential support services to displaced children, including access to education, healthcare and psychosocial support.
5. The federal and state governments in Nigeria (particular states in the northwest region) should focus more attention and closely watch the activities of International Partners and Humanitarian Support Organizations with aim of preventing foreign influence on social security in Nigeria.

Conclusion

Early childhood education and care are services for children involving elements of both physical care and education. The ECE scheme provides critical contribution to cognitive stimulation, socialization, development and early education to children. However, the insecurity in northwest geo-political zone of Nigeria has had a devastating effect on early childhood education (ECE) in the region. Many children who have attained the age of schooling have been denied access to quality education due to numerous challenges such as the destruction of schools and so on. To improve access, equity and quality in ECE in northwest Nigeria, security situation has to be addressed to promote supportive learning environment which can help children develop cognitively, socially, physically and emotionally. In addressing the issue of insecurity, it is essential that government at the state and federal level make their presence much stronger than it is at present. By so doing, the return of peace and stability as well as rapid development in the northwest region is certain. Equally, the return of normalcy in the northwest will facilitate equal access to quality early childhood education among children in the region, regardless of their background or social circumstances.

References

Abubakar, K. M. and Ujah, B. A. (2018). Developing Creativity in Nigerian Pre-school Children: Imperative for Lifelong Learning. International Journal of Education Development (IJED), Vol. 22(3). 132-140 Available on-line at: www.benchmarkjournals.com

Aladejana, F. (2013). The child in the 21st century: can ICT change the face of learning? *Journal of Early Childhood Association of Nigeria (JECAN)*, Special Edition, 3(1): 1-17.

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner (Ed.), *Handbook of child psychology. Volume 1: Theoretical models of human development* (6th ed. pp. 793–828). Wiley. https://doi.org/10.1002/9780470147658.chpsy0114

Ekpo, S. S. (2018). Re-Engineering Human Existence through Foundation Building. The 64th Inaugural Lecture of the University of Uyo, delivered 30th August, 2018. Uyo University Press Ltd.

Federal Republic of Nigeria (2013). *National policy on education* (7th edition). Lagos: National Education Research and Development Council Press.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202574

Malti, T., & Noam, G. G. (2016). Social-emotional development: From theory to practice. *European Journal of Developmental Psychology*, 13(6), 652–665. https://doi.org/10.1080/17405629.2016.1196178

Mohammed, A.K. (2021). Teacher competence, facilities utilization and pupils acquisition of literacy skills in public primary schools in Sokoto state, Nigeria. Ph.D Thesis, University of Uyo, Uyo Akwa Ibom state, Nigeria

Muhammad, A.K. Jega, F. M. and Isah S. (2014).Nigeria's centenary and teacher production and utilisation at the primary education level: An overview of past and current challenges. *Farfaru Journal of Multi – Discipilinary Studies* (Special Conference Edition 2014). 8:27 – 32.

Obinaju, Q. I. (2011). Early childhood education in Nigeria of the 21st Century, pp 26-32. *In:* A. E. Udosen, D. E. Oko and I. E. Ekanem (Editorss) *Life and Academic Reflections of Professor Queen Idongesit Obinaju.* IVY Press Limited, Lagos, 238p.

UNICEF (2004). *The state of the world's children: childhood under threat*. New York: UNICEF House.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202575

Perception of Students on Impact of Social Studies Curriculum in Addressing Secretive Fraternities among Colleges of Educations in Adamawa State, Nigeria

NUHU, Philip[1]
Nuhuphilip647@gmail.com
07067958370
[1]Department of Arts and Social Science Education, Faculty of Education, Ahmadu Bello University, Zaria

SARKIN-FADA, Mohammed Abdul[1]
mohammedsarkinfada@gmail.com
08069759001

Abstract
The prevalence of cultism in Nigerian tertiary institutions, particularly in Adamawa State, poses significant challenges to academic integrity, institutional management, and societal stability. This study examines the Perception of Students on Impact of Social Studies Curriculum in Addressing Secretive Fraternities among Colleges of Education in Adamawa State, Nigeria. Grounded in differential association and opportunist theories, the research explores students' perceptions of the curriculum's effectiveness in fostering awareness and shaping attitudes toward cultism. A survey design was adopted, involving 196 participants from two colleges of education, with data analyzed using descriptive and inferential statistics. Findings reveal that the curriculum moderately addresses cultism by promoting awareness and ethical reasoning. However, gaps persist in resource adequacy and the integration of real-world issues. The study concludes that curriculum reform, coupled with innovative pedagogical strategies and institutional support, is essential for maximizing the curriculum's impact. Recommendations include integrating experiential learning, enhancing resource provision, and implementing institution-wide awareness campaigns to foster a culture of reform. This study contributes to knowledge by demonstrating the curriculum's potential in addressing societal challenges and advancing education as a tool for societal transformation.

Keyword: Social Studies, fraternities, Colleges

Introduction
The challenges posed by cultism and student unrest in tertiary institutions across Nigeria remain critical concerns for policymakers, educators, and societal stakeholders. These issues not only disrupt the academic environment but also undermine the moral and ethical foundation of Nigeria's educational system, with long-term implications for societal stability and national development (Owolabi & Alabi, 2021). Cultism, often associated with secretive fraternities, continues to infiltrate institutions of learning, introducing a culture of violence, fear, and moral decay (Massingill, 2023). Historically, secret societies have evolved from philosophical and fraternal traditions. For instance, the Freemasonry order, rooted in Enlightenment ideals and ancient guild practices, initially aimed to educate and morally uplift its members (Garlinghouse & McKelvie, 2022). However, these traditions, when transposed into the Nigerian context, have devolved into dangerous subcultures within tertiary institutions, marked by rituals, violence, and criminal activities (Elujekwute, 2019). Cultism in Nigeria's tertiary institutions has become a pressing issue, often labeled as the 'mother of crimes' within academic spaces. This menace has significantly affected institutional management, academic integrity, and the global perception of Nigerian graduates (Ogbagu, 2013). As Nnam (2014) aptly notes, the resurgence of cult-related activities represents one of the most significant challenges facing Nigeria's higher education system. These clandestine groups not only engage in violent acts but also disrupt academic calendars, incite fear among students and staff, and contribute to the declining quality of education.

The origins of cultism in Nigeria are often traced back to the Seadog Confraternity (also known as the Pyrates), established in 1952 by Wole Soyinka and six other students at the University College, Ibadan. Initially founded on principles of justice and non-violence, the group's trajectory changed dramatically in the 1960s, evolving into a violent and secretive cult. Over time, military interference in Nigeria's education system exacerbated the problem, with successive regimes exploiting student groups to suppress dissent and consolidate power. As Onyemwinmina and Aibieyi (2015) argue, the intersection of political violence and cultism in Nigeria reflects deeper societal fractures rooted in corruption, economic inequality, and the erosion of cultural values. Empirical evidence provides further insights into the causes, effects, and possible solutions to cultism in Nigerian

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202575

tertiary institutions. Ekpenyong (2010) identified economic collapse and poverty as key drivers of cultism, recommending improved educational funding to restore university prestige and deter cult-related activities. Ernest and Okeke (2025) highlighted determinants such as peer pressure, drug abuse, and poverty, noting that awareness campaigns and policy interventions are crucial. Omemu (2025) found public awareness campaigns effective in addressing cultism but emphasized the need for balanced disciplinary approaches. Eleje et al. (2024) underscored inadequate funding as a primary cause, advocating for targeted research and increased institutional resources to mitigate cultism's impacts. Together, these studies reinforce the urgency of multifaceted strategies to address cultism in Nigerian colleges of education. The Social Studies curriculum, as a multidisciplinary framework, offers a strategic avenue for addressing the challenges posed by cultism and secretive fraternities. Rooted in fostering critical thinking, ethical reasoning, and civic responsibility, the curriculum aims to empower students to resist the allure of cultism and contribute positively to their communities (Ajiboye et al., 2022). By emphasizing social values, conflict resolution skills, and moral education, Social Studies equips learners with the intellectual and emotional tools to navigate complex societal challenges. Moreover, the curriculum aligns with global best practices in using education as a transformative tool for social change. For instance, UNESCO (2021) underscores the role of education in promoting peace, tolerance, and respect for diversity. In this context, Social Studies serves as a vehicle for instilling these values, particularly in regions where systemic issues such as cultism threaten educational and societal progress. Despite its potential, the effectiveness of the Social Studies curriculum in curbing cultism remains underexplored. While existing literature highlights its role in fostering civic consciousness and ethical behavior, empirical studies on its direct impact on cultism and student unrest are sparse. This gap underscores the need for comprehensive research that captures the perspectives of students, the primary beneficiaries of the curriculum and evaluates its efficacy in addressing the unique challenges of secretive fraternities in Nigerian tertiary institutions.

The resurgence of cultism in Nigerian colleges of education, particularly in Adamawa State, necessitates a critical re-evaluation of the Social Studies curriculum. As societal dynamics evolve, the curriculum must adapt to address emerging challenges. For instance, integrating themes such as digital citizenship, peer influence, and the psychological underpinnings of group behavior could enhance its relevance and impact (Adeyemi & Dada, 2021). Furthermore, leveraging innovative pedagogical approaches, including experiential learning and community engagement, could foster deeper student engagement and understanding. Collaborative efforts among educators, policymakers, and community stakeholders are essential in ensuring the curriculum's alignment with contemporary realities and its capacity to effect meaningful change.

Objectives of the study

The general objectives of the study was on Perception of students on impact of social studies curriculum in addressing Secretive Fraternities among Colleges of Education in Adamawa state, Nigeria.. The specific objective of the study is to:

1. Assess students' perceptions on Social Studies curriculum contents as a mechanism for addressing Secretive Fraternities in Colleges of Education Adamawa State, Nigeria

Research Question

The study seeks to answer the following questions:

1. What is the extent of students' perceptions on Social Studies curriculum contents as a mechanism for addressing Secretive Fraternities in Colleges of Education Adamawa State, Nigeria?

Research Hypotheses

The hypotheses was tested at 0.05 alpha level of significance:

Ho_1: There is no significant difference in the perception of students on Social Studies curriculum contents as a mechanism for addressing Secretive Fraternities in Colleges of Education Adamawa State, Nigeria.

Theoretical frame work

This study is anchored on differential association theory, developed by Edwin H. Sutherland, and opportunist theory, proposed within broader criminological and sociological frameworks, including Robert K. Merton's strain theory, which provides foundational insights into opportunistic behavior. These theories offer comprehensive perspectives on the factors enabling secretive fraternities and inform how the Social Studies curriculum can address the problem. Differential Association Theory: Differential association theory, introduced by Edwin H. Sutherland (1947), asserts that deviant behavior, such as cultism, is learned through social interactions and exposure to deviant norms. The theory identifies factors such as frequent association with cultist peers, peer pressure, revenge, and youthful exuberance as main influences. Additionally, poor parenting and lack of supervision increase the likelihood of deviant behavior among students.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202575

Sutherland's theory suggests that students exposed to deviant social groups adopt behaviors and attitudes conducive to cultism. To counteract this, the Social Studies curriculum can incorporate lessons that teach students to recognize and resist peer pressure, develop moral reasoning, and build healthy interpersonal relationships. The opportunist theory is often associated with ideas articulated by scholars like Robert K. Merton (1938), who discussed how societal structures create unequal access to legitimate means of success, leading to deviant behavior as a coping mechanism. The theory posits that individuals, when faced with limited opportunities or challenging circumstances, exploit available means whether legal or illegal to achieve their goals. In the context of secretive fraternities, this theory explains how students may be drawn to cultism for material benefits, social acceptance, or academic advantages in a competitive and inequitable environment. By addressing systemic issues such as lack of student support, inadequate counseling, and limited recreational facilities, the Social Studies curriculum can redirect students toward constructive and ethical pathways for achieving success. Differential association theory focuses on the micro-level interpersonal dynamics that lead to cultism, while opportunist theory addresses the macro-level societal and institutional factors. Together, these theories provide a comprehensive framework for understanding and combating secretive fraternities. A well-designed Social Studies curriculum can leverage these insights by promoting pro-social values, ethical decision-making, and community engagement.

Conceptual framework

Secret fraternities, or cults, are covert groups with significant societal and academic impacts. Ogunade (2005) defines a secret cult as "an exclusive holy philosophy and a closed-off community of people committed to the same purpose," emphasizing their ritualistic and symbolic practices, often involving blood. Adegbenro (2023) highlights cultism's violent consequences in academic institutions, where inter-group conflicts frequently result in fatalities. Ajayi et al. (2010) note the secrecy and ceremonial nature of these groups, underscoring their detrimental effects on members and institutions. Drivers of cultism include unemployment and social inequality (Oyetunde & Okafor, 2022), while Okeke and Hassan (2021) argue that social media facilitates recruitment and ideological dissemination. These critiques frame cultism as both a cause and symptom of broader societal dysfunction, such as declining moral standards and academic instability (Adegbenro, 2023). Conceptually, secret fraternities reflect sociocultural dynamics tied to inequality and moral decline, requiring interdisciplinary solutions that address their historical, psychological, and sociological dimensions

Literature Review

Cultism has become a pervasive issue in Nigerian higher education, evolving from benign fraternal organizations to violent, secretive groups. Early confraternities, such as the Pyrates, founded in 1952 at the University College, Ibadan, aimed to promote social justice and moral integrity among students (Massingill, 2023). However, these groups devolved into violent entities during the political turbulence of the 1960s and 1970s, exacerbated by military regimes exploiting student groups to suppress dissent (Onyemwinmina & Aibieyi, 2015). This shift mirrored broader societal challenges, including political corruption, economic inequality, and moral decay (Elujekwute, 2019). Research highlights the detrimental effects of cultism on educational institutions, including academic disruption, violence, and a declining quality of education. Ogbagu (2013) identified cultism as a significant factor eroding the image and management of Nigerian tertiary institutions, while Nnam (2014) emphasized its role in fostering a culture of fear and impeding effective learning.

Factors Contributing to Cultism in Nigerian Institutions

Several factors contribute to the proliferation of cultism in Nigerian tertiary institutions, including societal pressures, economic hardship, and inadequate moral education. Onyemwinmina and Aibieyi (2015) argue that political violence and systemic corruption have normalized deviant behaviors among Nigerian youth. Additionally, Elujekwute (2019) highlights the role of peer influence, a lack of parental guidance, and institutional weaknesses in perpetuating cultism. The transition of fraternal groups into violent entities has been linked to structural issues within Nigerian society. For instance, economic disparities and the erosion of cultural values create an environment where cultism thrives (Garlinghouse & McKelvie, 2022). Addressing these root causes requires a holistic approach, integrating education, community engagement, and policy reforms.

Social Studies Curriculum as a Tool for Social Transformation

The Social Studies curriculum is uniquely positioned to combat societal vices like cultism by fostering ethical reasoning, civic responsibility, and critical thinking. As a multidisciplinary field, Social Studies addresses societal challenges through themes of citizenship education, moral values, and conflict resolution (Ajiboye et al., 2022). The curriculum emphasizes the development of cognitive, affective, and behavioral competencies, equipping students to make informed decisions and resist negative peer influences (Adeyemi & Dada, 2021). Globally, education has been recognized as a powerful tool for social transformation. UNESCO (2021) advocates for curricula that promote peace, tolerance, and respect for diversity. Within the Nigerian context, Social Studies serves as a critical intervention, particularly in addressing youth-related issues like cultism

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202575

and violence (Owolabi & Alabi, 2021). However, the efficacy of this curriculum in Nigerian colleges of education remains underexplored, necessitating further research. Innovative pedagogical approaches can enhance the effectiveness of the Social Studies curriculum in addressing cultism. Adeyemi and Dada (2021) propose the integration of experiential learning, digital citizenship education, and community engagement to deepen student understanding and application of social values. By leveraging technology and interactive teaching methods, educators can foster critical thinking and ethical reasoning among students. Studies also suggest that community-based learning initiatives, such as service-learning projects and peer mentoring programs, can bridge the gap between theoretical knowledge and real-world application (Ajiboye et al., 2022). These approaches align with global best practices in education, emphasizing active learning and collaborative problem-solving. While existing literature underscores the potential of Social Studies to address cultism, there is a paucity of empirical studies examining its direct impact. Most studies focus on the general benefits of civic and moral education without exploring the curriculum's specific role in combating cultism in Nigerian Colleges of Education. Furthermore, research often neglects the perspectives of students, who are the primary beneficiaries and agents of change.

Methodology

This study utilized a survey research design to generalize findings from a sample of 457 NCE II students at the Federal College of Education, Yola, and the Adamawa State College of Education, Hong (Creswell & Creswell, 2021). A sample size of 196 participants, determined using the Research Advisor table (Research Advisor, 2006), ensured representation and validity. Data were collected through a self-developed questionnaire validated by experts in Social Studies, English Language, and Test and Measurement from Ahmadu Bello University, Zaria. A pilot test with 30 students yielded a high reliability score of 0.876 (Tavakol & Dennick, 2021). Descriptive statistics, including means and standard deviations, addressed research questions, while one-sample t-tests at 0.05 significance level tested hypotheses (Tabachnick & Fidell, 2021). Ethical approval was secured, with informed consent obtained and confidentiality maintained throughout the study (Creswell & Creswell, 2021).

Presentation of Results

Bio-data of respondents

Table 1: Bio-data of Respondents by Gender

Gender	Frequency	Percent
Male	103	53
Female	93	47
Total	196	100

Table 1 shows that male respondents are one hundred and three (103) representing fifty three (53) percent while female respondents are ninety three (93) representing forty seven (47) percent. In this distribution, female respondents are less comparing to their male counterpart.

Research Question one

What is the extent of the perception of students on Social Studies curriculum contents as tool for addressing secretive fraternities in Colleges of Education in Adamawa State, Nigeria?

To answer this research question, the data collected was subjected to descriptive statistics of mean and standard deviation. Table 2 presents summary of the result:

Table 2: Summary of Means and Standard Deviations on views of students on Social Studies curriculum contents as tool for addressing secret fraternities in Colleges of Education in Adamawa State, Nigeria

S/N	Items	Mean	SD
1	Social Studies curriculum adequately addresses issues related to secretive fraternities in Colleges of Education in Adamawa State, Nigeria.	3.13	0.864
2	I have a clear understanding of the content of social studies curriculum in addressing secretive fraternities in Colleges of Education in Adamawa State.	2.96	0.858
3	Social Studies curriculum effectively incorporates real-world issues, including challenges posed by secretive fraternities in Colleges of Education in Adamawa State.	2.04	1.137

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202575

4	Social Studies curriculum has increased my awareness of the implications of secretive fraternities in Colleges of Education in Adamawa State.	2.17	1.116
5	I am satisfied with the content of Social Studies curriculum in addressing issues related to secretive fraternities in Colleges of Education in Adamawa State.	3.03	0.991
6	I believe that Social Studies curriculum is an effective tool for addressing the challenges posed by secretive fraternities in Colleges of Education in Adamawa State.	2.62	1.024
7	Messages in the curriculum against secretive fraternities are clear and easily understandable by students in Colleges of Education in Adamawa State.	2.67	0.950
8	There are adequate resources (books, materials, etc.) in place to support the teaching of social studies curriculum content related to secretive fraternities in Colleges of Education in Adamawa State.	2.63	1.144
9	Social Studies curriculum is effective in addressing issues related to secretive fraternities in colleges of Education in Adamawa State.	2.31	1.090
10	Social Studies curriculum has positively influenced my attitudes towards secretive fraternities in Colleges of Education in Adamawa State.	3.02	1.022
	Aggregate Mean	2.66	

Table 2 shows that the positive responses statements were accepted while the negative statement were rejected. The highest mean response was 3.13 while the lowest was 2.04. The aggregate mean was 2.66 above the criterion mean of 2.5. This implies that the respondents accepted the statements which indicate agreement. This means that the respondents perceived that Social Studies curriculum contents are capable of addressing secretive fraternities in Colleges of Education in Adamawa State, Nigeria

Hypothesis one:

There is no significant difference in the perception of students on Social Studies curriculum contents as tool for addressing secretive fraternities in Colleges of Education in Adamawa State, Nigeria.

Table 3: Summary of One Sample t-test on difference in the perception of students on Social Studies curriculum contents as tool for addressing secretive fraternities in Colleges of Education in Adamawa State, Nigeria

Item	N	Mean	SD	SE	T	Df	Sig. (2-tailed)
awareness of the implications of secretive fraternities	196	2.170	1.116	0.07897	27.478	195	0.000

Table 3 reveals t-calculated value of 27.478 and p-value of .000 at .05 level of significance. Since the p-value is lower than the t-calculated value, it means that there is significant difference in the perception of students on Social Studies curriculum contents as tool for addressing secret fraternities in Colleges of Education in Adamawa State, Nigeria. Therefore, it is evident that the awareness of the implications of secretive fraternities have positive influence. On this premise, the null hypothesis which states that there is no significant difference in the perception of students on Social Studies curriculum contents as tool for addressing secretive fraternities in Colleges of Education in Adamawa State, Nigeria is rejected.

Summary of findings

Based on data analysis, the study came out with a major finding as presented below;

The study found out that students are of the perception that Social Studies curriculum content had moderately addresses secretive fraternities in Adamawa State Colleges of Education by fostering awareness and shaping attitudes, gaps remain in resource adequacy and integration of real-world issues. (P-value = .000).

Discussion of Finding

The findings from this study reveal that while the Social Studies curriculum moderately addresses secretive fraternities in Adamawa State Colleges of Education by fostering awareness and shaping attitudes, gaps persist in resource adequacy and real-world issue integration. This aligns with Ekpenyong (2010) and Eleje et al. (2024), who underscore structural and funding deficiencies as critical factors perpetuating cultism in educational institutions. Similarly, Ernest and Okeke (2025) highlight the role of institutional weaknesses, such as inadequate awareness and prevention mechanisms, which contribute to the

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202575

persistence of cultism. However, a divergence emerges in the nature of recommended interventions. This study emphasizes the role of curriculum reform, while other studies like Omemu (2025) focus more on public awareness campaigns and disciplinary measures. The use of a survey design in this study, with validated and pilot-tested instruments, ensures reliability and internal consistency, evidenced by a high Cronbach's Alpha coefficient of 0.876. This methodological rigor is comparable to Ernest and Okeke (2025), who also employed a mixed-methods design with robust validation processes. However, the inclusion of inferential statistics like one-sample t-tests in this study enhances its analytical depth compared to Ekpenyong (2010), which relied solely on descriptive statistics. A notable similarity across the studies is the ethical consideration, ensuring confidentiality and informed consent, as seen in Omemu (2025) and Eleje et al. (2024). However, the sampling techniques vary. For instance, this study used a probability-based method (Research Advisor table), ensuring representation, whereas Eleje et al. (2024) employed purposive sampling, potentially introducing bias. The findings of this study highlight the curriculum's potential as a tool for combating cultism, albeit with identified gaps. This aligns with Ekpenyong (2010), who recommends structural reforms, and Eleje et al. (2024), who advocate for increased funding. However, unlike Ernest and Okeke (2025), which identifies drug abuse and peer pressure as determinants, this study focuses on curricular inadequacies. One critical distinction is the emphasis on institutional roles. Omemu (2025) demonstrates the efficacy of public awareness campaigns, which this study supports indirectly by suggesting real-world issue integration. However, the current study expands on this by proposing a direct curricular response, offering a more comprehensive approach to fostering awareness.

Conclusion

The study concludes that the Social Studies curriculum in Adamawa State Colleges of Education moderately addresses issues related to secretive fraternities, as evidenced by students' positive perceptions and significant differences in awareness and attitudes. While the curriculum fosters awareness and shapes attitudes effectively, it requires further enhancement to better incorporate real-world issues and ensure adequate teaching resources. This underscores the need for ongoing curriculum development and resource provision to maximize its impact on addressing societal challenges within the educational framework.

Recommendation

Based on the findings, the study recommends that:

1. To enhance the effectiveness of the Social Studies curriculum in addressing secretive fraternities, it is essential to integrate real-world issues through case studies, role-playing, and scenario-based learning while ensuring the availability of adequate teaching materials and instructor training. Institution-wide awareness campaigns should be launched in collaboration with stakeholders to promote the curriculum's objectives and foster a culture of awareness and reform. Additionally, periodic evaluations should be conducted to assess the curriculum's impact and guide data-driven improvements

Contribution to Knowledge

The study established that:

1. Students perceived that Social Studies curriculum content had the potential to address secretive fraternities by integrating real-world issues, offering a model for similar educational interventions, and advancing knowledge on education's role in combating negative social phenomena for broader societal reform.

References

Adegbenro, F. T. (2023). *Cultism in Nigerian higher institutions: Causes and consequences*. Academic Press.

Adeyemi, T., & Dada, M. (2021). Innovations in curriculum design for conflict resolution in Nigerian schools. *Journal of Education and Social Policy, 8*(3), 45–60.

Ajayi, I. A., Ekundayo, H. T., & Osahisi, S. (2010). Cultism in tertiary institutions in Nigeria: Implications for national development. *African Journal of Education, 5*(2), 123–133.

Ajiboye, J. O., Adekunle, O., & Fakunle, O. (2022). The role of Social Studies in fostering civic engagement among Nigerian youths. *African Journal of Educational Research, 10*(2), 101–118.

Creswell, J. W., & Creswell, J. D. (2021). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.

Elujekwute, O. (2019). Cultism in Nigerian universities: Causes and remedies. *Education Today, 6*(1), 23–35.

Garlinghouse, T., & McKelvie, C. (2022, January 21). Freemasons: History, facts and myths. *Live Science*. https://www.livescience.com/freemasons.html

Massingill, R. (2023). The founding and development of secret societies and fraternal orders and their influence on modern American society. *International Journal on Social and Education Sciences (IJonSES), 5*(1), 99–110.

Nnam, M. U. (2014). Cultism in Nigerian tertiary institutions: A sociological perspective. *Sociology and Criminology – Open Access, 2*(3), 1–6.

Ogbagu, C. (2013). The impact of cultism on education in Nigeria. *Journal of Educational Development, 7*(2), 68–75.

Ogunade, R. A. (2005). Philosophical underpinnings of secret cults in Nigeria. *Journal of Cultural Studies, 3*(4), 98–112.

Okeke, I. O., & Hassan, M. A. (2021). Social media and the resurgence of secret fraternities in Nigerian universities. *International Journal of Social Sciences, 14*(3), 45–57.

Onyemwinmina, A. O., & Aibieyi, S. (2015). Political violence and cultism in Nigeria: A study of university campuses. *International Journal of Humanities and Social Science, 5*(5), 85–94.

Owolabi, B., & Alabi, K. (2021). Cultism in Nigerian tertiary institutions: Causes, consequences, and countermeasures. *International Journal of Social Science Research, 10*(4), 55–70.

Oyetunde, S., & Okafor, C. (2022). The socio-economic drivers of cultism in Nigeria's tertiary institutions. *Nigerian Journal of Sociology, 8*(1), 78–92.

Research Advisor. (2006). *Sample size table*. http://www.research-advisor.com

Sutherland, E. H. (1947). *Principles of criminology* (4th ed.). J. B. Lippincott.

Tabachnick, B. G., & Fidell, L. S. (2021). *Using multivariate statistics* (7th ed.). Pearson.

Tavakol, M., & Dennick, R. (2021). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*(1), 53–55.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202576

Effects of Computer-Aided Instruction on Attitude and Performance in Family Health Concepts among Upper Basic Students in Sabon Gari, Kaduna State, Nigeria

USAINI, Jafar[1]
usainijafar@gmail.com
08032326319

BASIRU, Muhammad[1]
basirumuhammad@gmail.com
08038232870

[1]Department of Science Education, Ahmadu Bello University, Zaria, Kaduna State, Nigeria

Abstract
This study investigated the effect of Computer-Aided Instruction (CAI) on students' attitude and academic performance in Family Health concepts among Upper Basic II students in Sabon Gari Local Government Area, Kaduna State, Nigeria. A quasi-experimental pretest-posttest control group design was employed, involving 102 students from two public secondary schools. Participants were assigned to experimental and control groups. The experimental group was taught using a multimedia-based CAI package, while the control group was taught using the conventional method. Two validated instruments—the Family Health Concept Performance Test (FHCPT) and the Family Health Attitude Questionnaire (FHAQ)were used for data collection. Results indicated a statistically significant improvement in the experimental group's performance ($M = 28.37$, $SD = 1.73$) compared to the control group ($M = 15.61$, $SD = 2.41$), with a t-calculated value of 31.62 ($p < 0.05$). Similarly, the attitude scores favored the experimental group, as shown by a significant Mann-Whitney U-test result ($U = 75.30$, $p < 0.05$). These findings suggest that CAI enhances students' understanding and improve more positive attitudes toward Family Health concepts. The study concludes that CAI is an effective instructional strategy for attitude and academic performance of students in basic science. It recommends that policymakers and teachers integrate CAI into classroom instruction, supported by adequate infrastructure and teacher training, to improve teaching of Basic Science in Nigerian schools.

Keywords: Computer-Aided Instruction, Attitude, Familia Health, Academic Performance

Introduction
In the evolving landscape of global education, the integration of digital technology into teaching and learning has become not only desirable but essential. The growing complexity of knowledge, coupled with the diversity of learners' needs, demands instructional approaches that go beyond traditional teacher-centered methods (Ghaaleb, 2024). One such approach is Computer-Aided Instruction (CAI), which leverages multimedia tools to enhance learning through interactive, individualized, and engaging content delivery. According to Odey (2025), CAI has been identified as a promising innovation for improving learners' outcomes, especially in science-related subjects. Computer-Aided Instruction (CAI) is an instructional method that utilizes computers and software applications to present lessons, provide practice opportunities, and offer immediate feedback to learners (Owede, 2024). Its interactive nature promotes learner autonomy, enhances motivation, and facilitates the understanding of abstract concepts. Studies have shown that CAI significantly improves learners' academic performance and encourages positive attitudes toward the subject matter (Owede, 2024; Bakare, 2024). In contexts where students often struggle with understanding and comprehension and low attitude towards concepts such as family health, CAI can serve as a bridge to effective learning. Attitude toward learning, defined as a learned predisposition to respond favorably or unfavorably to academic content, plays a pivotal role in students' educational outcomes. Positive attitudes are associated with increased attitude, participation, and willingness to explore subject matter, while negative attitudes often lead to apathy, and academic underachievement (Katsantonis & Katsantonis, 2024). In the concept of health education, sensitive topics like hygiene, sexual health, and family responsibilities are taught, students' attitudes can significantly influence their academic performance and attitude. Thus, transforming negative attitudes into positive dispositions is a key goal of in improving academic performance in family health concepts (Kostić,2024). According to Li et al., (2024) Academic performance refers to the measurable outcomes of learners' engagement with instructional content, typically assessed through tests, assignments, and other evaluative methods. Poor performance in science-related subjects at the basic education level has been a persistent challenge in Nigeria.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202576

Several studies have attributed this to factors such as overcrowded classrooms, limited instructional materials, insufficient teacher training, and the use of monotonous teaching strategies (Vakili, et al., 2024). There is increasing agreement that innovative teaching methods like CAI can address these gaps by making learning more accessible, engaging, and efficient. Family Health, a sub-theme in the Basic Science curriculum, addresses topics such as Family Health, personal hygiene, family roles, reproductive health, and disease prevention. These topics are not only vital for academic purposes but are crucial for developing responsible and healthy adolescents. However, research has indicated that many students find Family Health topics abstract or embarrassing, especially when taught using conventional chalk-and-talk methods (Yillah et al., 2025). Students often exhibit low attitude, poor understanding, and negative attitudes, which in turn reflect in their academic performance.

Empirical studies have emphasized the positive impact of CAI on both affective (attitude) and cognitive (performance) learning outcomes. For instance, Haruna and Ambode (2024) and Nganyadi(2024) reported that, students taught with CAI performed significantly better than those exposed to conventional method in Basic Science. Similarly, Delello (2025) found that CAI helped in reshaping students' attitudes by providing a non-threatening, personalized learning environment. These findings show the potential of CAI as an effective instructional method in enhancing learning across various subjects. Despite these, there remains a gap of localized research examining the application of CAI in specific content areas like Family Health within Nigeria's Basic Education sector. there is a need for innovative teaching approaches that can make learning more meaningful, inclusive, and effective.It is against this background that this study investigates the effect of Computer-Aided Instruction on attitude and performance in Family Health concepts among Upper Basic II students in Sabon Gari LGA, Kaduna State, Nigeria.

In recent years, the consistent low performance of students in science-related subjects at the basic education level in Nigeria has raised serious concerns among educators, researchers, and policymakers. Despite curriculum reforms and teacher capacity-building programs, many students continue to exhibit low academic performance and negative attitudes toward core science topics such as Family Health, a concept central to the Basic Science curriculum that addresses hygiene, Family Health, family responsibilities, and reproductive health (Siphukhanyo& Olawale, 2024). According to Okpara and Ezeador (2024) Conventional teaching methods, often characterized by teacher-centered delivery, rote memorization, and inadequate use of instructional media, have been widely criticized for failing to stimulate learners' attitude. Family Health, being both sensitive and context-dependent, requires student-centered and interactive strategies that not only enhance understanding but also shape students' attitudes positively. However, the teaching methods commonly used in classrooms often fall short of achieving this dual objective (Du & Han, 2024). Several studies conducted have shown that Computer-Aided Instruction (CAI) can significantly improve students' academic performance and positively influence their attitude toward learning (Bakare, 2024; Owede, 2024; Panga et al., 2025; Uwaifo, et al., 2025). Yet, there is a noticeable gap in empirical research regarding the use of CAI specifically for teaching family health concept at the Upper Basic level. Therefore, this study investigated the effect of Computer-Aided Instruction on students' attitude and academic performance in Family Health concepts among Upper Basic II students in Sabon Gari Local Government Area of Kaduna State, Nigeria.

Objectives of the Study

The main objective of the study is to investigate the effect of Computer-Aided Instruction on Attitude and Performance in Family health Concept among Upper Basic II students in Sabon Gari Local Government, Kaduna state, Nigeria. Therefore, the study specifically aims to:

1. Determine the effect of Computer-Aided Instruction on Upper Basic II students' academic performance in family health concept.
2. Examine the effect of Computer-Aided Instruction on Upper Basic II students' attitude in family health concept.

Research Questions

The following research questions guided the study:

1. What is the difference between the mean academic performance scores of Upper Basic II students taught family health concepts using Computer Aided Instruction and those taught using conventional method?
2. What is the difference between the attitude level of students taught family health concepts using Computer Aided Instruction and those taught using conventional method?

Null Hypotheses:

The following null hypotheses were formulated and tested at 0.05 level of significance:

H_{01}: There is no significant difference in the mean academic performance scores of students taught the family health concept using Computer-Aided Instruction and those taught using conventional method.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202576

H_{02}: There is no significant difference in the attitude of students taught the family health concept using Computer-Aided Instruction and those taught using conventional method.

Methodology

This study adopted a quasi-experimental research design, pretest-posttest non-equivalent control group design. This design was chosen because it allows for the comparison of outcomes between a group exposed to the treatment and a group taught using the conventional method, without the need for random assignment of subjects (Sambo, 2008). The design is appropriate for educational settings where intact classes are used. The population for this study comprised all Upper Basic II in Sabon Gari Local Government Area of Kaduna state, Nigeria during the 2024/2025 academic session. The population was selected because family health is a key component of the Upper Basic II Basic Science curriculum, and students at this level have already acquired foundational knowledge suitable for this study. A total of 102 Upper Basic II students selected from two public secondary schools in Sabon Gari Local Government Area participated in the study. A purposive sampling technique was used to select schools that had basic computer facilities. The sampled schools were assigned to experimental and control groups. Two instruments were developed and validated for data collection: the Family Health Concept Performance Test (FHCPT) which is a 30-item multiple-choice test designed to assess students' performance in family health concepts. The test items were derived from the Basic science past Basic Certificate Examination questions 2020-2025. The instrument was validated by experts in the Department of Science Education, Ahmadu Bello University, Zaria. A reliability coefficient of 0.83 was obtained using the Pearson Person Moment Correlation Coefficient (PPMC) by test-retest method at an interval of two weeks.

The Family Health Attitude Questionnaire (FHAQ) is a 20-item Likert-type questionnaire developed to measure students' attitude in family health concept. The items were scored on a 5-point scale (Strongly Agree to Strongly Disagree). The FHAQ was validated by experts from the Department of Educational Psychology and Counselling, Ahmadu Bello University, Zaria. Cronbach's Alpha was used to determine the reliability, yielding a coefficient of 0.79. The experimental group was taught using a Computer-Aided Instruction (CAI) package specifically developed for teaching the family health concept. The CAI included multimedia animations, and simulations designed to promote active learning. The lesson was delivered over a 6-week period, with two 40-minute Basic science lessons per week. The control group was taught the same content using the conventional method, Posttests was administered to both groups at the end of the 6-week instruction. The FHCPT and FHAQ were administered as posttests to both groups by the researcher. The data obtained were analyzed using descriptive and inferential statistics. Mean, standard deviation, mean rank and sum of rank were used to answer the research questions on performance and attitude of students in each group. Independent sample t-test and Mann Whitney U-test were used to test the null hypotheses and determine the effect of CAI on students' performance and attitude in family health concept. The null hypotheses were tested at 0.05 level of significance.

Presentation of Results

Research Question One: What is the difference between the mean academic performance scores of Upper Basic II students taught family health concepts using Computer Aided Instruction and those taught using conventional method? This research question was answered using mean and standard deviation.

Table 1 Mean and Standard Deviation of Posttest Scores of FHCPT for Experimental and Control Groups

Group	N	Mean	Std Deviation	Mean difference
Experimental	50	28.37	1.73	
				12.76
Control	52	15.61	2.41	

Table 1 shows that the experimental group has a mean score of 28.37 and a standard deviation of 1.73, while the control group has a mean score of 15.61 and standard deviation of 2.41 and a mean difference of 12.76. This implies that experimental group performed better than control group. To find out whether significance difference exist or not, null hypothesis one was tested.

Null Hypothesis One: There is no significant difference in the mean academic performance scores of students taught the family health concept using Computer-Aided Instruction and those taught using conventional method.

To test this null hypothesis, independent sample t-test was used, a summary of the analysis is presented in Table 2.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202576

Table 2: Summary of t-test Analysis of Post FHCPT Scores of Students in Experimental and Control Groups.

Group	N	Mean	Std. Deviation	Df	t-cal	P-value	Decision
Experimental	50	28.37	1.73	100	31.62	0.000	*Sig
Control	52	15.61	2.41				

*Significant at P≤0.05 level of significance

Result from Table 2, shows that the t-calculated is 31.62 and a P-value of 0.000 at the degree of freedom of 100 is obtained. The P-value is less than the alpha value of 0.05. Hence, the null hypothesis is rejected. This means that, there is a significant difference in the mean academic performance scores of SS2 Basic science students taught family health concept using Computer Aided Instruction. This difference is in favour of the experimental group. This also implies that; Computer Aided Instruction is effective for improving the performance of students in the experimental group.

Research Question Two: What is the difference between the attitude level of students taught family health concepts using Computer Aided Instruction and those taught using conventional method?

Here, the mean rank of students post attitude scores in the experimental and control groups were compared and presented in Table 3

Table 3: Summary of Mean Rank Attitude Scores of FHAQ for the Experimental and Control Groups

Group	N	Mean Rank	Sum of Rank	Mean Rank Difference
Experimental	50	91.17	4758.50	56.26
Control	52	34.91	1815.50	

From Table 3, the mean rank value 91.17 was obtained in the experimental group with a value of 4758.50 as the sum of rank; while in the control group, a mean rank value of 34.91 with a sum of 1815.50 was also obtained. A mean rank difference of 56.26 was computed, this shows that the experimental group develop a higher attitude than the control group.

To find out where significance difference exists, null hypothesis two was tested.

Null Hypothesis Two: There is no significant difference in the attitude of students taught the family health concept using Computer-Aided Instruction and those taught using conventional method.

Mann-Whitney U-test was used to test this hypothesis using post attitude ranking of the students in both experimental and control groups. The details of the result were presented in Table 4.

Table 4: Summary of Mann- Whitney U-test Analysis of Scores for Students in the Experimental and Control Groups.

Group	n	Mean Rank	Sum of Rank	U-value	P-value	Decision
Experimental	50	91.17	4758.50	75.30	.000	Sig*
Control	52	34.91	1815.50			

*Significant at P≤0.05 level of significance

Results in Table 4 shows that, the mean rank of 91.17 was obtained by the experimental group and a sum of 4759.50. On the other hand, the mean rank value of the control group was 33.87 and the sum of rank was 1815.50. The Mann-Whitney U-value was 75.30. Since the P-value of .000 is less than 0.05, there is significant difference between the attitude level of students in the experimental and control groups in favour of the experimental group who were taught family health using Computer Aided Instruction. Hence, the null hypothesis is rejected. This implies that, Computer Aided Instruction enhances students' attitude than Conventional method.

Discussion of Findings

Result showed that there is a significant difference in the mean academic performance scores of students taught family health concepts of Basic science with Computer Aided Instruction and those taught with Conventional method. This shows that Computer Aided Instruction is effective in improving the performance of students in the experimental group. However, those taught family health concept using Computer Aided Instruction acquired significantly higher performance mean scores than those taught family health concept using Conventional method. This finding agrees with those of Bakare (2024); Owede (2024) and Uwaifo et al., (2025) who found that students who were taught using Computer Aided Instruction gained better academic

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202576

performance as a result of their engagement as compared to those taught using Conventional method. From findings of the study, the results also revealed a significant difference in the attitude level of students exposed to Computer Aided Instruction and conventional method. The significant difference is in favour of the experimental group as revealed in the mean rank value, mean value and U-value. This finding is in line with Bakare (2024) and Panga et al., (2025) who reported that, students taught using Computer Aided Instruction had significant higher attitude in than those taught using conventional method. Thus, the learning being meaningful to them led to continually sustained attitude in learning.

Conclusion

The findings of this study have clearly demonstrated that Computer-Aided Instruction (CAI) is an effective instructional strategy for improving both academic performance and attitude of Upper Basic II students in the Family Health concept of Basic science. This implies that CAI promotes better comprehension of complex and abstract Basic science content by integrating visual and interactive elements that enhance cognitive engagement. Furthermore, the study revealed that students in the experimental group also developed a significantly higher level of attitude in the Family Health topic. This suggests that CAI not only supports academic achievement but also positively influences students' attitudes to engage with scientific content. The integration of CAI in Basic science teaching provides a way for addressing persistent challenges of poor performance and low attitude in scientific concepts such as Family Health.

Recommendations

Based on the conclusions drawn from the findings of this study, the following recommendations are made:

1. The Federal and State Ministries of Education, through relevant agencies, should equip public secondary schools with functional computer laboratories, digital projectors, and reliable power supply to support the effective implementation of CAI in science classrooms.
2. Regular in-service training, workshops, and seminars should be organized for Basic science teachers to build their capacity in designing, adapting, and delivering CAI-based lessons, ensuring they are equipped with the technical and pedagogical skills necessary for technology integration.
3. Curriculum developers and the Nigerian Educational Research and Development Council (NERDC) should incorporate CAI-based activities and resources explicitly in the Basic science curriculum, especially in conceptually challenging areas like family health.
4. School-Based Initiatives School administrators should encourage teachers to adopt blended learning models, combining CAI with Conventional methods to accommodate diverse learners' needs and enhance science education delivery.

References

Bakare, O. O. (2024). Analysis of CAI utilization and teachers 'attitudes on basic science students 'achievement in Osun state, Nigeria. *Indonesian Journal of Elementary Teachers Education*, *5*(2), 65-79.

Delello, J. A., Sung, W., Mokhtari, K., Hebert, J., Bronson, A., & De Giuseppe, T. (2025). AI in the Classroom: Insights from Educators on Usage, Challenges, and Mental Health. *Education Sciences*, *15*(2), 113.

Du, S., & Tan, H. (2024). Improving University Students' Classroom Learning Outcomes through Multi-dimensional Enhancement Methods Based on the Knowledge-Attitude-Practice Model. *Frontiers in Educational Research*, *7*(6).

Ghaleb, B. D. S. (2024). Effect of exam-focused and teacher-centered education systems on students' cognitive and psychological competencies. *International Journal of Multidisciplinary Approach Research and Science*, *2*(2), 611-631.

Haruna, M. M., &Ambode, A. B. (2024). Effects of computer assisted instruction on learning outcome in science subjects among secondary school students in Kogi state, Nigeria. *CUSTECH International Journal of Education*, *1*(1), 300-311.

Katsantonis, A., &Katsantonis, I. G. (2024). University students' attitudes toward artificial intelligence: An exploratory study of the cognitive, emotional, and behavioural dimensions of AI attitudes. *Education Sciences*, *14*(9), 988.

Kostić, M. (2024). Attitude towards health and own body as the basis of healthy lifestyles. In *Proceedings Book, International engineering conference Novi Sad: The Faculty of Technical Sciences University of Novi Sad, The Higher Education Technical School of Professional Studies in Novi Sad, Technical University of Zvolen, Slovakia and Faculty of Civil Engineering, University of Montenegro* (pp. 406-408).

Li, L., Ismail, S. M., Patra, I., & Lami, D. (2024). Not a passive learner but an active one: a focus on the efficacy of philosophy-based language instruction and its consequences on EFL learners' critical thinking, engagement, and academic achievement. *BMC psychology*, *12*(1), 148.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369
www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202576

Nganyadi, C. C. (2024). Effect of computer assisted instruction on secondary school students 'acquisition of science process skills on biology. *Journal of Science Education & Allied Disciplines*, *3*(1).

Odey, I. F. (2025). Effect of Computer Aided Instruction Using Animation on Students' Interest Thermal Energy in Abuja, Nigeria.

Okpara, G. C., &Ezeador, C. N. (2024). Philosophy of teaching: exploring various teaching methods for improved education in Nigeria. *Nnadiebube Journal of Philosophy*, *7*(3).

Owede, K. (2024). Effects of Use of Computer Aided Instructions (CAI) at Secondary School on Academic Performance Undergraduates in Bayelsa State. *Fuo-Journal of Educational Research*, *3*(1).

Panga, K. P., Canale, J. J. N., &Onsay, E. (2025). Does Computer-Assisted Instruction (CAI) Influence Academic Performance of High School Students in Social Studies? Evidence from the Philippines. *Journal of Mathematics Instruction, Social Research and Opinion*, *4*(2), 387-408.

Siphukhanyo, L., & Olawale, B. E. (2024). Chronicling the experiences of life sciences teachers and learners on the usage of enquiry-based learning in enhancing learners' academic performance. *Journal of Culture and Values in Education*, *7*(1), 19-36.

Uwaifo, R. O., Osah, M. I., &Obro, S. (2025). Computer-aided instruction on social studies student's achievement and retention. *Journal of Education and Learning (EduLearn)*, *19*(3), 1533-1540.

Vakili, R., Vakili, S., Ajilian Abbasi, M., & Masoudi, S. (2024). Overcrowded Classrooms: Challenges, Consequences, and Collaborative Solutions for Educators: A Literature Review. *Medical Education Bulletin*, *5*(2), 961-972.

Yillah, R. M., Sah, R. K., Bash-Taqi, A., & Osborne, A. (2025). Bridging the gap: exploring students' needs, knowledge, and preferences for delivering comprehensive sexuality education in Sierra Leone. *BMC Public Health*, *25*(1), 852.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202577

Assessment of Biology Content Knowledge on Academic Performance among Senior Secondary Schools in Kwara State, Nigeria

JOSIAH, Orioghwo Oghenetega[1]
Oorioghwo@gmail.com
08136834252

OGUOKO, Rita Akpobome[2]
ritaakpobomeoguoko@gmail.com
07032431916

[1]Department of science and Technology Education, Faculty of Education, University of Ibadan, Ibadan Nigeria
[2]Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Edo State

Abstract
This study investigated the assessment of biology content knowledge on academic performance among senior secondary schools in Kwara State Nigeria. A descriptive survey research design was adopted, involving a total of 600 senior secondary school students drawn from 24 schools (12 public and 12 private) across the three senatorial districts of the state. Data were collected using structured checklists to assess both curriculum content coverage and students' performance in biology in WAEC from 2011 to 2016. Descriptive statistics such as mean, percentages, and standard deviations were used to answer the research questions, while a paired simple t-test was employed to test for significant difference. The findings revealed that private schools recorded a higher average curriculum content coverage (mean = 1.79) compared to public schools (mean = 1.57). The t-test result indicated a statistically significant difference in the extent of curriculum coverage between public and private school ($p < 0.05$). The study concluded that extensive curriculum coverage significantly influences students' academic performance in biology. Based on these findings, the study recommends Future studies should explore curriculum content coverage and academic performance across other science subject and replicate this research in other state of the federation. School time table should be adjusted to allow sufficient periods or time for biology classes. This study contributes to body of knowledge by empirically establishing the direct relationship between curriculum content coverage and academic performance in the context of Nigerian secondary science education.

Keywords: assessment, academic performance, content knowledge, secondary schools.

Introduction
At the senior secondary level science is departmentalized into Biology, Chemistry and Physics. Biology which is the study of different forms, their evolution, structures, functions, growth, distribution and taxonomy occupies a unique position in the secondary school science curriculum. It serves as a pre-requisite to the study of other lucrative and challenging professions like; Medicine, Nursing, Pharmacy, Pharmacology, Biochemistry, Agriculture, Microbiology, Geology, Geography, Technological and other applied sciences. The vital role of the study of this discipline in the economic, industrial and public life of the learners and the general humanity cannot be overstressed (Ibe and Ukpai 2013; Akanbi and Kolawole, 2014). Biology curriculum was first introduced in 1977. At that time the duration for secondary school education was five years. The biology teaching was started in class four and in class five the students took the West African School Certificate Examination. In keeping with the dynamics of social change and demands on education, there was the need to broaden the curriculum. The quest for improving the method of teaching and learning of secondary school biology began in 1982 by the Nigerian Education Research Council (NERC, 2005). The Federal Government in collaboration with Esselte (Swedish non-governmental organization) initiated the National Secondary Science and Mathematics Project (NSSMP). They worked hand in hand with the federal government of Nigeria. The basic aim of that project was to inculcate learning through the use of a wide variety of instructional materials. The outcome of this was the emergence of the new biology curriculum in 1985 published by the Federal Ministry of Education. In this 1985 curriculum, many more topics in biology were introduced and the number of years to be spent in secondary school increased from five years to six years. The content of biology curriculum in 1985 was conceptual (i.e. arranged into concepts) and the concepts were: Concept of living; Basic ecological concepts;

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202577

Plant and animal nutrition; Variations and variability; Evolution and Genetics. After a revision in 2007, the biology curriculum content became thematic and it is arranged into four themes which now include: organization of life; the organization at work; the organism and its environment; and continuity of life. The biology curriculum has a spiral arrangement of content. Based on this spiral arrangement, the concepts to be taught are arranged in such a way that topics are repeated yearly, throughout the three years of the course; to cover the 62 units in the biology curriculum. Any repeated concept is discussed in greater complexity and depth as the course matures over the three year period. The contents of the senior secondary school biology curriculum places emphasis on field studies, guided discovery, laboratory techniques and skills. According to the West African Senior Secondary School Certificate Examinations' syllabus (2019/2020), the justifications for inclusion of Biology in the senior secondary school curriculum are as follow: Understanding of the structures and functions of living organisms as well as appreciation of nature; Acquisition of necessary laboratory and fields' skills in order to carry out and evaluate experiments and project in Biology; Acquisition of necessary scientific skills like observing, grouping and interpreting biological data; Acquisition of relevant knowledge in biology needed for future and advanced studies in biological sciences; Acquisition of scientific attitudes for problem solving; Ability to apply biological principles in everyday life in matters that affect personal, social, environmental, community health, and economic problems; Awareness of the existence of interrelationships between biology and other scientific discipline. This implies that when an individual successfully acquired the objectives stated in WAEC syllabus, would facilitate such to be scientific literate with particular reference to Biology. Similarly, (FRN 2014), the objectives of secondary school biology curriculum derived from the National Policy on Education first introduced in 1977 and revised in 1981, 1998, 2004 and 2014 are to acquire: Adequate laboratory and field skills in biology; Meaningful and relevant knowledge in biology; Ability to apply scientific knowledge to every day's life in matters of personal and community health and agriculture; Reasonable and functional scientific attitude.

In spite of the importance and acceptance of Biology among Nigerian students, a huge gap has been observed in the performance at senior secondary school level in public and private secondary schools in examinations such as WAEC and NECO and even in JAMB. It has been observed that the students in private schools are performing better than the students in public schools. A lot of evidence has proven that this observation is factual and there is need to look into the situation. In a study jointly carried out by the Federal Government of Nigeria, UNICEF and UNESCO in 1977 to monitor the Learning achievement of primary school pupils throughout the Federation, it was shown that most of the private Schools had means in the three areas tested higher than the national means and that of their public counterpart. Similarly, Yoloye (1998) while assessing the situation of education in Osun State, compared the quality of education In five states of the federation namely, Lagos, Ogun, Ondo, Osun and Oyo. He compared performance between Urban and rural schools; private and public schools, as well as between male and female primary school pupils. He concluded that while Osun State comes last in almost all the sub-sector analyzed, the only cheering exception is in the private schools where it performed better than other states and indeed exceeded the grand mean. In a study carried out in the U.S. by Lubienski and Lubienski (2006), they compared academic achievement among Charter, private and public schools. One of the major findings from this study showed that private schools scored higher than charter and public schools. In a related study carried out also in the U.S. by Braun, Jenkins and Grigg (2006), they compared the performance of pupils in private and public schools in both reading and mathematics Involving grades 4 and 8, results showed that the private schools performed better than the public schools not only in Reading and mathematics, but also in the two grades (4^{th} & 8^{th}) involved in the study. Overall, findings indicated that the average private school mean score was higher than the average public school mean score, and that the difference was statistically significant.

The use of examinations to carry out assessment according to Alonge (2013) has been on the increase worldwide with the establishment of examination bodies like WAEC and NECO.

Table showing students' biology performance in WAEC

Year	Total sat	Credit pass A1-C6	% pass
2011/12	1505199	579432	38.50
2012/13	1646150	587044	35.66
2013/14	1648363	852717	51.73
2014/15	1365384	766971	56.17
2015/16	1390234	798246	57.42

Source: statistics section of the WAEC office Yaba, Lagos (2017) uploaded by Olalekan T.B.

The situation was worse in 2009/2010 where only 33.94% of the total population recorded A1- C6 in Biology (WAEC: Kwara State, 2018). From the data presented above, the percentage of candidates that pass biology at credit level and above

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202577

was below 50%. However, the situation differs in private schools where data shows that the percentage of candidates that pass biology at credit level and above was above 50%. Therefore, it is worrisome to note that the biology curriculum being implemented since 1985 still produce students who achieve poorly in biology. According to UNESCO (2012), the underachievement in Biology can be attributed to student related factors, teacher related factors and Physical factors of the learning environment as well as the difficulty of the biology content. Of these groups of factors, the teacher plays a pivotal role in creating conducive learning environments that can enhance student cognitive and affective outcomes. Ekundayo and Alonge (2016), opined that the precarious situation of lack of human and material resources is more evident in public schools than in the private schools and this shows why the private schools tend to perform better than the public schools in public examinations. Owoeye & Yara, (2011) opined that a close look at the schools and what goes on there shows that nothing good can come out of most public schools as they do not have facilities and adequate and appropriate human resources to prepare candidates for West African Examination Council (WAEC) examinations.

Researchers have explored the effects of teachers' qualification (Etukudo, Elijah and Nnaobi, 2003; Landu, 2003), effects of instructional materials and laboratory (Dareng and Agenda 2002), attitude of teachers and students towards the teaching and learning of sciences (Eze, 2003), the effects of peer group (Briggs, 1995) on students' academic performance. Though, these researches are quite revealing, the problem still persists. Hence, there is need for more researches and increased implementation of recommendations. Inadequate content coverage in science subjects is most likely to significantly hinders academic performance of students in Nigeria. Studies consistently show that incomplete curriculum delivery, particularly in challenging areas, leads to poor achievement in standardized exams. This issue is prevalent across different science disciplines, including Biology, Chemistry, and Physics. Umeh (2011) emphasized that incomplete curriculum coverage often due to lack of instructional time, inadequate teacher preparation, and poor infrastructure significantly contributes to underperformance in standardized examinations in science subjects such as Biology, Chemistry, and Physics. Ezeudu & Ezeudu, (2013). Incomplete coverage of the science curriculum, particularly in abstract topics like physics and biology, leads to poor student outcomes in national exams like WAEC and NECO. Ikechuku (2012), in his research on the "Content coverage and students' achievements in secondary school physics in Delta State" revealed that an increase in content taught leads to improved students' achievement in both Ministry-made test and a general improvement in Teacher-made test over that of Ministry-made Physics tests. He further established that if teaching is not content bound, the science teacher would be happy to pick few areas or concepts well known to him and leave other areas of the concept he may consider difficult and tedious. The negligence by teachers to teach the whole of the stipulated content has led to poor achievement in standardized examinations. The theoretical framework adopted in this study is the Input – Process – Output (IPO) Model as it relates to education. The model is a theoretical framework used to explain how educational outcomes are achieved through a structured system of interacting components. It is widely applied in evaluating teaching and learning effectiveness. In the context of this study, curriculum content coverage (input) and teaching practices (process) directly influence student academic performance (output). The IPO model highlights the importance of optimizing both resources and instructional methods to achieve desired educational goals. The study therefore, sought to find out the extent of biology curriculum content coverage and its impact on student academic performance in public and private secondary schools in Kwara State, Nigeria.

While private schools often demonstrate better academic outcomes, the extent to which curriculum content is effectively covered and how this impacts student performance remains unclear. This study, therefore, seeks to investigate the differences in Biology curriculum content coverage between public and private secondary schools in Kwara State and how these differences influence students' academic performance.

Aims and Objectives of the Study

1. Determine the extent to which the biology curriculum content is covered in public and private senior secondary schools in Kwara State
2. Compare the level of biology curriculum content coverage between public and private secondary schools in the study area
3. Examine the relationship between the extent of biology content coverage and students' academic performance in public and private senior secondary schools

Research Questions

1. To what extent is the biology curriculum content covered in public and private secondary schools in Kwara State?
2. How does the extent of biology content coverage influence students' academic performance in public and private secondary schools?

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202577

Research Hypothesis

1. There is no significant difference in the extent of biology curriculum content coverage between public and private secondary schools in Kwara State?

Methodology

The design of this study is descriptive survey design. Descriptive survey aims to accurately and systematically describe a population, situation or phenomenon. Random sampling technique was adopted for this study. The sample of this study consisted of eight secondary schools each in the three senatorial districts of Kwara State. The eight schools selected from each senatorial district in a particular local government comprise four public school and four private schools making a total of twenty-four (24) schools. Data were obtained from senior secondary school students offering biology. In each school 25 students were randomly selected and used as a sample representative making a total of 600 students in all. Data used for the study were collected with the aid of check list for student performance in WAEC and a check list to determine the extent to which the curriculum content has been thought. Descriptive statistics such as frequency counts, percentage, mean and standard deviation were used to answer the research questions

Presentation of Results

Research Question 1

To what extent is the biology curriculum content taught in public and private senior secondary schools in Kwara State

	Mean score for public school	Mean score for private school
Recognizing living things	**2.00**	**2.00**
Classification of living things	**1.83**	**2.00**
The cell and its environment	**1.83**	**2.00**
Properties and functions of cell	**1.75**	**2.00**
Tissue and supporting system	**1.67**	**1.83**
Nutrition in animals	**1.83**	**1.92**
Basic ecological concept	**1.83**	**2.00**
Relevance of biology to agric	**1.67**	**2.00**
Reproduction in unicellular	**1.75**	**1.67**
Digestive systems	**1.50**	**1.83**
Transport system	**1.25**	**1.58**
Respiratory systems	**1.17**	**1.58**
Excretory system	**1.08**	**1.58**
Nutrient cycling in nature	**1.17**	**1.50**
Ecological management	**1.50**	**1.50**
Conservation of natural resour.	**1.42**	**1.50**
Reproduction in vertebrate	**1.33**	**1.58**
Reproduction in plants	**1.50**	**2.00**
Pollination in plants	**1.83**	**1.92**
Average mean	**1.57**	**1.79**

The table above showed the mean and standard deviation of the extent the content of biology curriculum is taught in public and private senior secondary schools in Kwara State. From the table, the weighted mean of private schools (1.74) is higher

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202577

than that of public schools (1.65). Hence, the biology curriculum content is fully taught to a greater extent than it is taught in the public schools.

Research Questions 2

How does the extent of biology content coverage influence students' academic performance in public and private secondary schools?

Table Showing Performance of Students in WAEC in Public and Private Schools in Kwara State

Years of exam	Total numbers of result analyzed		Freq/% Credit pass at A1		Freq/% Credit pass at B3-B2		Freq/% Credit pass at C4-C6		Freq/% of failure at D7-F9	
	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv	Pub	Priv
2011/2012	500	500	21 (4.2)	146 (29.2)	97 (19.4)	259 (51.8)	282 (56.4)	55 (11.0)	100 (20)	40 (8.0)
2012/2013	400	400	19 (4.8)	140 (35.0)	82 (20.5)	184 (46.0)	218 (54.5)	46 (11.5)	81 (20.3)	30 (7.5)
2013/2014	600	600	21 (3.5)	167 (27.8)	105 (17.5)	322 (53.7)	353 (58.8)	65 (10.8)	121 (20.2)	46 (7.7)
2014/2015	600	600	16 (2.7)	152 (25.3)	90 (15.0)	340 (56.7)	363 (60.5)	55 (9.2)	131 (21.8)	53 (8.8)
2015/2016	600	600	23 (3.8)	138 (23.0)	95 (15.8)	352 (58.7)	367 (61.2)	54 (9.0)	115 (19.2)	56 (9.3)

Source: result obtain from field work in the area of the study

The table above shows the performance of students in WAEC for both public and private schools in Kwara State. The results indicate that students in the private schools perform better than students in public schools. The overall result revealed that for every five hundred, four hundred and six hundred results analyzed for both the public and private schools, those with credit pass at A1 in private schools are more than those in public schools and likewise credit pass at B3-B2. Those with credit pass at C6-C4 are more in public schools than in private schools. Lastly, the table also shows that, the rate of failure is higher in public schools than in private schools.

Research hypothesis

There is no significant difference in the extent of biology curriculum content coverage between public and private secondary schools in Kwara State?

Paired Simple T-test table

Group	N	Mean	SD	Df	t-crit	t-cal	Decision
Public	19	1.5742	.27534	18	-5.651	0.000023	hypothesis rejected
Private	19	1.7889	.20933				

Source: result of analysis obtained from SPSS.

From the table above, the t-cal, when tested at a 0.05 level of significance showed that there is a significant difference in the extent of biology curriculum content coverage between public and private secondary schools in Kwara State. Hence, the hypothesis was rejected.

Discussion of Findings

This study revealed that private schools' biology teachers cover more of the biology curriculum content than there counterpart in the public senior secondary schools in each academic terms. This therefore, showed that the curriculum content covered have a significant impact on students' performance in biology. Proprietors of schools always try to avoid bottle neck cases when inspectors from ministry of education comes visiting. Meetings are held on weekly bases where emphasis is always laid on submission of note on weekly bases. In most cases teachers are sanctioned when they fail to comply. As a

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202577

result teachers work hard to make sure that their notes and their students' notes are up to date. This in turn leads to increased content taught. Such disciplines are rear in public schools. As a result, teachers don't always cover the curriculum content as expected which is leading to the poor performance of students in the public schools. This finding is highly supported by recent research. Umeh (2011) emphasized that incomplete curriculum coverage often due to lack of instructional time, inadequate teacher preparation, and poor infrastructure significantly contributes to underperformance in standardized examinations in science subjects such as Biology, Chemistry, and Physics. Ezeudu & Ezeudu, (2013), incomplete coverage of the science curriculum, particularly in abstract topics like physics and biology, leads to poor student outcomes in national exams like WAEC and NECO. This finding is also highly supported by Ikechuku (2012), in his research on the "Content coverage and students' achievements in secondary school physics in Delta State" revealed that an increase in content taught leads to improved students' achievement in both Ministry-made test and a general improvement in Teacher-made test over that of Ministry-made Physics tests. He further established that if teaching is not content bound, the science teacher would be happy to pick few areas or concepts well known to him and leave other areas of the concept he may consider difficult and tedious. The negligence by teachers to teach the whole of the stipulated content has led to poor achievement in standardized examinations. This study therefore, with its analysis and evidence from recent research is able to establish that private schools students perform better in biology than public school students because private schools cover more of the biology curriculum content than the public schools. This assertion is highly supported by table two above which reflect on the level of student's performance in WAEC examination. The table is a testament of an underperformance in public schools compare to high level of performance in private schools. According to Nwokocha & Amadike (2005), academic performance of students is the yardstick for testing educational quality of a nation. Hence, it is expedient to maintain a high performance in internal and mostly external examinations. The result from this research revealed that student in private schools performs excellently well than their counterpart in public schools. Also the claim that students in private schools perform better than those in public school is lastly supported by the result from table 3. The result from the table showed that there is a significant different in mean extent to which curriculum content is covered in public and private schools.

Conclusion

This research fills a research gap by detailing how the depth of biology curriculum coverage specifically influences performance, contributing novel insights into science education at the secondary school level. It draws attention to the urgent need for strict enforcement of curriculum coverage in public schools. It provides quantitative proof that private schools are more effective in completing the biology curriculum within the academic calendar. These insights add to existing literature by offering localized evidence from Kwara State.

In conclusion, this study establishes that curriculum coverage is fundamental determinant of academic success. The findings from this study serve as a call to action for education authorities to strengthen policies and practices that ensure full and effective coverage of the biology curriculum, thereby raising the quality of science education and preparing students more effectively for STEM discipline.

Recommendations

1. The use of the combination of curriculum coverage checklist and WAEC result analysis provides a practical and replicable model for assessing the effectiveness of curriculum implementation Future studies should explore curriculum content coverage and academic performance across other science subject and replicate this research in other state of the federation to draw broader conclusions and inform national policy
2. School time table should be adjusted to allow sufficient periods or time for biology classes. Private schools do lessons after normal school closing hours which offer their teachers time to further cover areas not covered during normal school period.

Acknowledgment

This study is an extract from my (Orioghwo Oghenetega Josiah**)** master degree thesis. It was a millstone, that couldn't have been possible without the help of the almighty God. I want to quickly appreciate my supervisor at the University of Ibadan, the person of Professor Alice Morenike Olagunju for her unreserved supervision of this work, members of panel at the departmental and even at the external defense who helped to shape and add better insight to this research work that has gone out for publication today. Also, I want to thank my co-author the person Rita Akpobome Oguoko. We are course mate at the University of Benin for our PhD program. It was when we met; the idea of this publication was conceived. Her insight and contribution to ensure this publication is undeniable. Quickly, I want to also say big thank you to members of the body in charge of this publication at the Zanfara International Journal of Education (ZIJE) for their review of this paper and their added insight to ensure that, this paper meet standardize paper for publication.

Zamfara International Journal of Education (ZIJE)
The Official Journal of the Faculty of Education
Federal University Gusau, Zamfara State, Nigeria
Volume 5, Number 3, July, 2025
pISSN: (Hard Copy): 2814 – 1377; eISSN (Online): 2814 – 1369 www.foefugusau.com.ng
DOI: https://doi.org/10.64348/zije.202577

References

Akanbi, A. O., & Kolawole, A. O. (2014). Science education and development in Nigeria: Problems and prospects. Journal of Research in Science Education, 2(1), 45–52.

Alonge, M. F. (2013). Assessment and evaluation in education: A tool for quality assurance. Journal of Educational Measurement and Evaluation, 5(2), 25–33.

Braun, H., Jenkins, F., & Grigg, W. (2006). A closer look at charter schools using hierarchical linear modeling. Washington, DC: National Center for Education Statistics.

Dareng, C., & Agenda, A. (2002). Availability of science laboratories and academic performance in science subjects. Journal of Educational Studies, 4(1), 30–39.

Ekundayo, H. T., & Alonge, M. F. (2016). Resource availability and students' performance in secondary school biology in Nigeria. Journal of Educational Research, 7(1), 12–19.

Eze, D. N. (2003). Attitudinal factors affecting science learning among secondary school students. Nigerian Journal of Curriculum Studies, 10(1), 23–31.

Ezeudu, F. O., & Ezeudu, S. A. (2013). Instructional materials and improvisation in physics class: Implications for teaching and learning. Journal of the Science Teachers Association of Nigeria (STAN), 48(1), 56–64.

Federal Republic of Nigeria (FRN). (2014). National Policy on Education (6th ed.). Lagos: NERDC Press.

Ibe, E., & Ukpai, I. E. (2013). The relevance of biology education in Nigerian development. Journal of Biological Sciences Education, 3(1), 15–21.

Ikechuku E. (2012), Content Coverage and Students' Achievement in Secondary School Physics: The Delta State Example of Nigeria. Asia – Pacific Forum on Science Learning and Teaching, Volume 13, issue 1, Article 14, p.1 (June 2012)

Landu, A. (2003). Teachers' academic qualification and student academic performance in science subjects. Education Today, 10(2), 41–46.

Lubienski, C., & Lubienski, S. (2006). Charter, private, public schools and academic achievement: New evidence from NAEP mathematics data. National Center for Education Statistics.

Nigerian Educational Research Council (NERC). (2005). History of curriculum development in Nigeria. Abuja: NERDC Press.

Owoeye, J. S., & Yara, P. O. (2011). School location and academic achievement of secondary school students in Ekiti State, Nigeria. Asian Social Science, 7(5), 170–175.

Umeh, M. O. (2011). Curriculum Implementation and Instructional Delivery: Challenges for Nigerian Secondary School Science Teachers. Journal of Research in Science and Technology Education, 4(1), 22–29.

Ezeudu, F. O., & Ezeudu, S. A. (2013). Instructional Materials and Improvisation in Physics Class: Implications for Teaching and Learning. Journal of Science Teachers Association of Nigeria (STAN), 48(1), 56–64.

WAEC (West African Examinations Council). (2018). Summary of candidates' performance in Biology (Kwara State). Ilorin: WAEC Office.

Yoloye, E. A. (1998). Comparative study of education quality in selected southwestern states. Ibadan: Macmillan.