



Awareness, Adoption and Perceived Impact of Artificial Intelligence Utilisation among Professional Diploma Students of Ahmadu Bello University, Zaria, Kaduna State

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Abstract

This study examined artificial intelligence (AI) utilisation among Professional Diploma in Education students at the Institute of Education, Ahmadu Bello University, Zaria, with emphasis on (i) awareness and adoption of AI-related tools and (ii) students' perceived academic benefits of AI use. A descriptive cross-sectional survey design was employed. Forty-two usable responses were obtained from an estimated population of 60 students through simple random sampling. Data were collected using a structured 25-item questionnaire and analysed with frequencies, percentages, means, and standard deviations. Respondents reported high awareness of AI tools ($M = 4.38$), but only moderate active use ($M = 3.23$) and limited formal training ($M = 2.82$). Perceived academic benefits were highest for research efficiency ($M = 4.09$), time management ($M = 4.00$), and engagement with course materials ($M = 4.00$), whereas critical-thinking development received the lowest mean among the six dimensions ($M = 3.55$). In addition, 78.6% of respondents reported that their academic performance had improved since adopting AI tools. Because these outcomes are self-reported and the study is cross-sectional, the findings should be interpreted as perceived academic benefits rather than causal evidence that AI improves academic performance. The study highlights the need for structured AI-literacy training, clearer institutional guidance, and pedagogical approaches that encourage critical and ethical use of AI in professional education.

Keywords: Artificial Intelligence; AI Awareness; AI Adoption; Professional Diploma in Education

Introduction

The rapid integration of Artificial Intelligence (AI) into educational systems has altered how knowledge is accessed, processed, and applied across levels of learning. AI-supported applications now include intelligent tutoring systems, automated feedback, adaptive learning platforms, natural-language tools, and research assistants. These technologies are increasingly positioned as important components of contemporary educational practice because they can support personalised learning, improve access to academic resources, and reduce some routine academic workloads (Wang et al., 2024; Bali et al., 2024). In Nigeria, interest in AI for education has also increased as institutions seek technology-supported responses to large class sizes, resource limitations, and unequal learning opportunities (Abubakar et al., 2024; Yakubu, 2024). Professional Diploma in Education (PDE)



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students occupy a distinctive position within this development. Many are adult or professionally engaged learners who combine academic responsibilities with employment and personal commitments, creating a strong demand for flexible and efficient learning support (Eteng-Uket & Effiom, 2024). At the Institute of Education, Ahmadu Bello University, Zaria, understanding how PDE students become aware of AI tools, adopt them, and perceive their academic value can provide evidence for institutional training and support. Although the literature on AI in higher education is expanding, empirical evidence focused specifically on professional diploma students in Nigerian university contexts remains limited. Existing studies also frequently discuss awareness and utilisation together even though familiarity with a technology does not necessarily imply sustained or effective academic use. This study therefore focuses on two dimensions: awareness and adoption of AI-related tools, and students' perceptions of the academic benefits associated with their use.

Research Objectives

The study was guided by the following objectives:

1. To assess the level of awareness and adoption of AI-related tools among Professional Diploma in Education students at the Institute of Education, Ahmadu Bello University, Zaria.
2. To examine students' perceived academic benefits associated with the use of AI tools.

Research Questions

1. What is the level of awareness and adoption of AI-related tools among the students?
2. How do students perceive the influence of AI-tool use on selected academic outcomes?

AI in Education: Conceptual Overview

Artificial Intelligence in education encompasses technologies such as intelligent tutoring systems, natural-language processing tools, automated assessment systems, adaptive learning environments, and AI-assisted research applications (Ayeni et al., 2024). A common feature of these systems is their capacity to provide responsive support and reduce the cognitive or logistical burden associated with some academic tasks. Jaiswal and Arun (2021) argue that AI can contribute to the transformation of educational systems by enabling more adaptive and personalised learning experiences. For professional and postgraduate learners, generative AI and other digital academic-support tools may also assist with literature searching, drafting, revision, and organisation of scholarly work. However, the educational value of these tools depends on how they are used and the extent to which users critically evaluate their outputs.

Awareness and Adoption of AI Tools

Awareness and adoption represent related but distinct stages of technology use. Awareness refers to familiarity with the existence and functions of a technology, whereas adoption involves its actual and continuing integration into practice. Diffusion of Innovation theory provides a useful perspective for understanding why awareness may spread more rapidly than sustained use, particularly where institutional support, perceived usefulness, compatibility, and access differ across learners (Phillips, 2025). Studies in Nigerian tertiary institutions similarly report increasing awareness of AI alongside constraints associated with digital infrastructure, training, and academic-integrity concerns (Abubakar et al., 2024; Ibrahim et al., 2024). Evidence from South African higher education also suggests that institutional conditions shape how students and educators engage with AI tools (Khoalenyane & Ajani, 2024).

AI Use and Academic Outcomes



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Research on AI in higher education commonly reports potential benefits for research support, writing, tutoring, feedback, and learning efficiency, while also identifying risks related to over-reliance, academic integrity, and reduced independent engagement. Systematic and review studies indicate that generative AI can support learning when it is integrated purposefully, but outcomes depend on pedagogical design and the manner in which students interact with AI-generated content (Wang et al., 2024; Zhang et al., 2024). Concerns are especially relevant for critical thinking: AI may act as a scaffold for inquiry when learners interrogate and refine its outputs, but passive reliance may reduce opportunities for independent reasoning (Kalniņa et al., 2024; Klimova & Pikhart, 2025).

Theoretical Framework

The study is interpreted primarily through Diffusion of Innovation theory and the Technological Pedagogical Content Knowledge (TPACK) perspective. Diffusion of Innovation provides a basis for examining differences between awareness and sustained adoption, whereas TPACK emphasises that effective educational use of technology depends on the interaction of technological competence, pedagogy, and subject knowledge (Hanifah et al., 2024; Phillips, 2025). Together, these perspectives support the view that exposure to AI alone is insufficient; learners also require structured guidance on when, why, and how AI should be used within academic practice.

Research Methodology

Research Design and Population

The study adopted a descriptive cross-sectional survey design to characterise patterns of AI awareness, adoption, and perceived academic benefits within a defined student population. The target population comprised approximately 60 Professional Diploma in Education students enrolled at the Institute of Education, Ahmadu Bello University, Zaria, across the 2022/2023, 2023/2024, and 2024/2025 academic sessions.

Sample and Sampling Technique

Forty-two usable questionnaires were analysed, representing approximately 70% of the estimated target population. Respondents were selected using simple random sampling. The original manuscript referred to a Yamane-based minimum sample size, but the precision parameter used in that calculation was not documented in the supplied study record; the present revision therefore reports the achieved sample without reproducing an incomplete sample-size calculation.

Instrument and Measurement

Data were collected using a structured 25-item questionnaire organised into five sections: demographic information; AI awareness and adoption; perceived academic benefits; utilisation challenges; and open-ended suggestions for improvement. Items measuring awareness and perceived academic benefits used a five-point Likert response format ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Content and face validity were established through expert review by the project supervisor.

Validity, Reliability and Ethical Reporting

The supplied manuscript documents face and content validity but does not report an internal-consistency coefficient for the Likert scales. It also does not provide an institutional ethics approval or exemption reference, informed-consent procedure, or confidentiality statement. These details have not been invented in this revision and should be added from the original research records before journal submission. Where item-level response counts differ, the valid N is reported directly in the results.

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Data Analysis

Data were analysed using descriptive statistics: frequency counts, percentages, means, and standard deviations. For interpretation of five-point Likert means, scores from 1.00 to 2.49 were classified as low, 2.50 to 3.49 as moderate, and 3.50 to 5.00 as high. The analysis is descriptive; consequently, the findings are interpreted as reported perceptions and patterns rather than causal effects.

Presentation of Results

Objective 1: Awareness and Adoption of AI-Related Tools

The first objective examined the level of awareness and adoption of AI-related tools. Results are presented in terms of the categories of tools reported and respondents' ratings of awareness, use, institutional exposure, understanding, and training.

Reported AI Tool Categories

Table 1: Reported AI Tool Categories

AI Tool Category	Representative Tools	Reported Users
Content Generators	ChatGPT, Gemini, Claude, DeepSeek	10
Proofreading and Paraphrasing Tools	Grammarly, QuillBot	6
Reference Managers	Zotero, Mendeley	4
Research Assistants	Consensus, Elicit	3
General-Purpose AI Tools	ChatGPT, Gemini, Claude, DeepSeek	3
Other Tools	BestAI	1

Note. Frequencies are reproduced from the source data. The percentages in the original manuscript were not retained because they do not correspond to the overall sample of 42 respondents and the valid denominator for this item was not documented. The category labels also overlap for some tools; therefore, the counts should be interpreted as coded responses rather than mutually exclusive adoption rates. Content-generation tools received the highest reported count (10), followed by proofreading and paraphrasing tools (6), reference managers (4), and research assistants (3). The pattern suggests that respondents more frequently reported tools that provide immediate support for drafting and text refinement than tools oriented towards literature discovery or reference organisation. Because the valid denominator and category exclusivity are not documented for this item, percentage-based comparisons are not made.

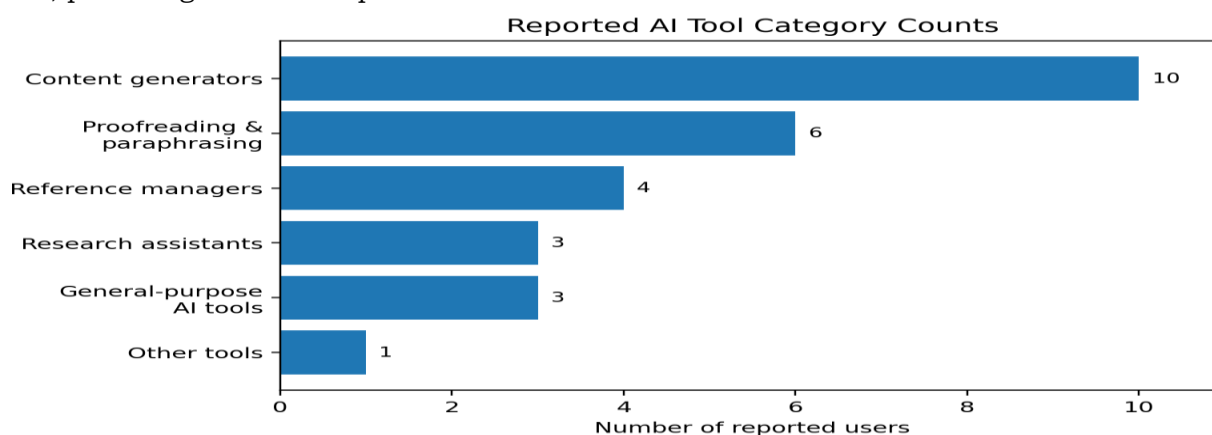


Figure 1: Reported AI Tool Category Counts

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4.1.2 Self-Rated Awareness, Use, Exposure, Understanding, and Training

Table 2: Descriptive Statistics for AI Awareness and Adoption Items

S/N	Item Statement	Valid N	Mean	SD	Interpretation
1	I am aware of AI tools used in education.	39	4.38	1.37	High
2	I actively use AI tools in my academic activities.	39	3.23	1.66	Moderate
3	The university has exposed me to AI tools in learning.	33	3.09	1.49	Moderate
4	I understand how AI tools work in supporting academic tasks.	33	3.64	1.50	High
5	I have attended training or workshops related to AI in education.	33	2.82	1.75	Moderate

Note. Valid response counts vary across items (N = 33–39). The supplied manuscript does not document the reason for the item-level differences. Interpretation scale: 1.00–2.49 = Low; 2.50–3.49 = Moderate; 3.50–5.00 = High. Awareness of AI tools recorded the highest mean (M = 4.38, SD = 1.37), indicating a high level of familiarity among respondents who answered the item. Active academic use was moderate (M = 3.23, SD = 1.66), while perceived university exposure was also moderate (M = 3.09, SD = 1.49). Respondents reported a high level of understanding of how AI tools support academic tasks (M = 3.64, SD = 1.50). Participation in AI-related training or workshops recorded the lowest mean (M = 2.82, SD = 1.75), which falls within the study's moderate range rather than the low range. Overall, the pattern indicates stronger awareness than active use or formal training.

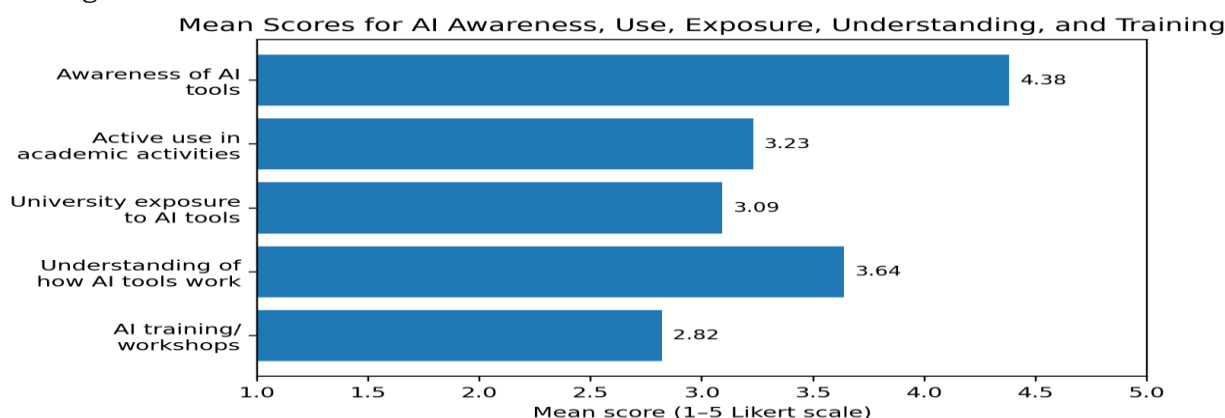


Figure 2: Mean Scores for AI Awareness, Use, Exposure, Understanding, and Training
Objective 2: Perceived Academic Benefits of AI Use

The second objective examined respondents' perceptions of how AI-tool use relates to selected academic outcomes. The results represent perceived benefits and should not be interpreted as objective or causal measures of academic performance.

Perceived Benefits across Academic Dimensions

Table 3: Mean Scores for Perceived Academic Benefits of AI Use (N = 42)

S/N	Academic Dimension	Mean	SD	Interpretation
1	Research efficiency	4.09	1.14	High
2	Quality of assignments/reports	3.91	1.29	High
3	Examination preparation	3.91	1.22	High
4	Critical thinking development	3.55	1.35	High

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5	Time management	4.00	1.18	High
6	Engagement with course materials	4.00	1.34	High

Note. Interpretation scale: 1.00–2.49 = Low; 2.50–3.49 = Moderate; 3.50–5.00 = High.

Respondents rated all six academic dimensions within the high range. Research efficiency received the highest mean ($M = 4.09$, $SD = 1.14$), followed by time management and engagement with course materials (both $M = 4.00$). Quality of assignments/reports and examination preparation each recorded $M = 3.91$. Critical-thinking development recorded the lowest mean ($M = 3.55$, $SD = 1.35$), although it remained within the predefined high category. The lower relative score for critical thinking is consistent with literature cautioning that the educational value of AI depends on active and reflective engagement rather than passive acceptance of generated outputs (Kalniņa et al., 2024; Zhang et al., 2024).

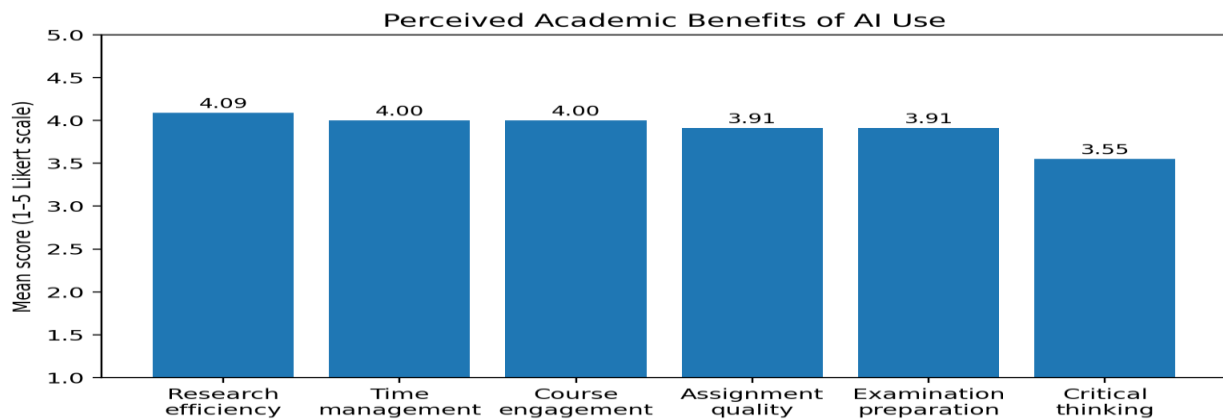


Figure 3: Perceived Academic Benefits of AI Use

Overall Self-Reported Change in Academic Performance

Table 4: Self-Reported Change in Academic Performance since Adopting AI Tools

Response	Frequency	Percentage (%)	Cumulative (%)
Yes – Improvement Observed	33	78.6	78.6
Maybe – Uncertain	6	14.3	92.9
No – No Change	3	7.1	100.0
Total	42	100	—

Note. Source: Field survey, 2025. Coding in the original analysis: Yes = 3, Maybe = 2, No = 1; $M = 2.71$, $SD = 0.60$.

Thirty-three of the 42 respondents (78.6%) reported that they had observed an improvement in their academic performance since adopting AI tools. Six respondents (14.3%) were uncertain, and three (7.1%) reported no change. These responses indicate a predominantly positive perception of AI use. They do not, however, establish that AI caused the reported improvement because no objective academic records, pre-intervention measurements, comparison group, or longitudinal design were used.

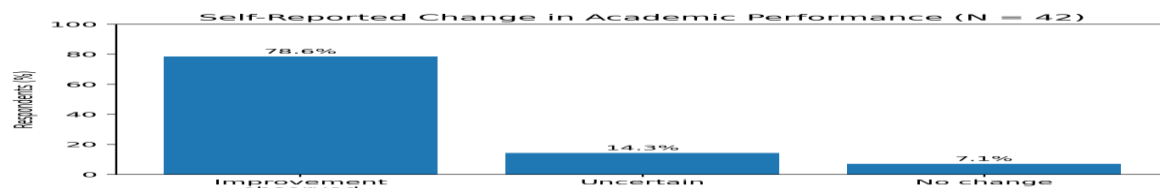


Figure 4: Self-Reported Change in Academic Performance since Adopting AI Tools (N = 42)



Discussion of Findings

Awareness and Adoption: Evidence of an Awareness–Use Gap

The results indicate a clear difference between awareness of AI tools and their sustained academic use. Awareness was high ($M = 4.38$), whereas active use was moderate ($M = 3.23$), and participation in formal training was lower still ($M = 2.82$). This pattern is consistent with the proposition that awareness can diffuse more rapidly than effective adoption when institutional support, skills, or guidance are uneven (Phillips, 2025). Similar constraints relating to training, infrastructure, and uncertainty around academic use have been reported in Nigerian higher education (Abubakar et al., 2024; Ibrahim et al., 2024). The tool-category counts also show greater reporting of content-generation and language-support applications than of research assistants or reference-management tools. This may reflect differences in accessibility, familiarity, or perceived immediacy of benefit, although the present data do not directly identify the reasons for the pattern. Accordingly, these explanations should be treated as plausible interpretations rather than demonstrated causal mechanisms. From an institutional perspective, the combination of high awareness and more moderate use suggests that structured AI-literacy activities could help students move from basic familiarity towards more deliberate and academically responsible use.

Perceived Academic Benefits and the Critical-Thinking Caveat

Respondents reported positive perceptions across all six academic dimensions. Research efficiency had the highest mean, while time management, engagement with course materials, assignment quality, and examination preparation also received high ratings. These findings align with broader literature describing AI as potentially useful for feedback, drafting, tutoring, information organisation, and other forms of academic support (Wang et al., 2024; Zhang et al., 2024). Critical-thinking development received the lowest mean ($M = 3.55$), although it remained within the high category. Its relative position is important because it suggests that perceived gains in efficiency do not necessarily translate equally into perceived gains in higher-order reasoning. Previous research similarly cautions that AI can support critical inquiry when learners challenge, verify, and extend AI outputs, but may reduce independent engagement when outputs are accepted uncritically (Kalniņa et al., 2024; Klimova & Pikhart, 2025). Pedagogical guidance should therefore frame AI as a support for reasoning rather than a substitute for reasoning.

Implications for Practice

The findings support three practical priorities.

1. The Institute of Education could provide structured AI-literacy training that covers effective prompting, verification of AI-generated information, responsible citation, privacy, and academic integrity.
2. Students could be introduced to a broader range of digital academic-support tools rather than relying predominantly on content-generation applications.
3. Assessment practices could require students to demonstrate the reasoning, evidence, and reflective processes underlying AI-assisted work, thereby preserving the development of independent judgement.

Limitations

The findings should be interpreted in light of several limitations. The study was conducted within a single institution and involved 42 respondents, limiting the extent to which the results can be generalised to other populations. Academic outcomes were self-reported rather than measured using grades, examination scores, or other objective records. The cross-sectional design does not establish



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temporal ordering or causality. Valid response counts differed across some awareness and adoption items, but the supplied manuscript did not document the reason for these differences. The source manuscript also did not report internal-consistency statistics for the Likert scales or sufficient information to reproduce the originally stated Yamane sample-size calculation. In addition, the tool-category item contains overlapping categories and an undocumented denominator for the original percentages. Future studies should use clearly defined, mutually exclusive or explicitly multiple-response categories, document missing-data handling, report scale reliability, and where possible combine self-reported perceptions with objective academic-performance measures.

Conclusion

This study assessed AI awareness, adoption, and perceived academic benefits among Professional Diploma in Education students at the Institute of Education, Ahmadu Bello University, Zaria. The findings indicate high awareness of AI tools but more moderate active use, institutional exposure, and training. Respondents generally perceived AI as beneficial for research efficiency, time management, engagement with course materials, assignment quality, and examination preparation. Critical-thinking development received the lowest mean among the six academic dimensions, although it remained within the high interpretation category. Most respondents also reported that their academic performance had improved since adopting AI tools. These results support the value of structured institutional guidance while also underscoring the need for careful interpretation. Because the evidence is based on self-reported perceptions from a descriptive cross-sectional survey, it does not demonstrate that AI use caused academic improvement. Institutional initiatives should therefore focus not only on expanding access to AI tools but also on developing students' capacity to use them critically, ethically, and reflectively. Future research should incorporate validated scales, objective performance indicators, larger multi-institution samples, and analytical designs capable of examining associations or causal effects more rigorously.

Recommendations

1. The Institute of Education should provide structured AI-literacy training covering effective prompting, verification of AI-generated information, responsible citation, privacy, and academic integrity.
2. Students should be exposed to a wider range of academic-support tools, including research assistants and reference managers, rather than relying predominantly on content-generation applications.
3. Teaching and assessment practices should require students to demonstrate the reasoning, evidence, and reflective processes underlying AI-assisted work in order to protect the development of independent judgement and critical thinking.

References

- Abubakar, U., Onasanya, S. A., & Ibrahim, H. A. (2024). Student perspectives and impact of AI integration in pedagogical practices in Nigerian tertiary institutions. *Advances in Mobile Learning Educational Research*, 4(2), 1135–1148.
- Ayeni, O. O., Al Hamad, N. M., Chisom, O. N., Osawaru, B., & Adewusi, O. E. (2024). AI in education: A review of personalised learning and educational technology. *GSC Advanced Research and Reviews*, 18(2), 261–271.
- 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), Article 110.
- Eteng-Uket, S., & Effiom, E. U. (2024). Evaluation of postgraduate diploma in education programme in the University of Port Harcourt using the CIPP evaluation model. *Journal of Education in Developing Areas*, 31(5), 119–134.



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- Hanifah, U., Budayasa, I. K., & Sulaiman, R. (2024). TPACK competence of mathematics education students in designing constructivist learning. *Perspektiv Nauti i Obrazovaniya*, 2(68), 249–260.
- Ibrahim, A.-W., Taura, A. A., Ilyasu, A., Shogbesan, Y. O., & Lukman, S. A. (2024). Artificial intelligence: Perception and utilisation of AI technologies in educational assessment in Nigerian universities. *Edukasiana: Jurnal Inovasi Pendidikan*, 3(3), 367–380.
- Jaiswal, A., & Arun, C. J. (2021). Potential of artificial intelligence for transformation of the education system in India. *International Journal of Education and Development Using Information and Communication Technology*, 17(1), 142–158.
- Kalniņa, D., Nimante, D., & Baranova, S. (2024). Artificial intelligence for higher education: Benefits and challenges for pre-service teachers. *Frontiers in Education*, 9, Article 1501819.
- Khoalenyane, N. B., & Ajani, O. A. (2024). A systematic review of artificial intelligence in higher education in South Africa. *Social Sciences and Education Research Review*, 11(1), 17–26.
- Klimova, B., & Pikhart, M. (2025). Exploring the effects of artificial intelligence on student and academic well-being in higher education: A mini-review. *Frontiers in Psychology*, 16, Article 1498132.
- Phillips, K. N. (2025). *Artificial intelligence: Diffusion of innovation and generational considerations in a higher education institution* [Doctoral dissertation, Marymount University]. ProQuest Dissertations & Theses Global.
- Wang, S., Wang, F., Zhu, Z., Wang, J., Tran, T., & Du, Z. (2024). Artificial intelligence in education: A systematic literature review. *Expert Systems with Applications*, 252, Article 124167.
- Yakubu, Y. (2024). Application of artificial intelligence in technology-enhanced learning for sustainable growth and inclusive development in Nigeria. *Zaria Journal of Educational Studies*, 24(1), 64–75.
- Zhang, X., Zhang, P., Shen, Y., Liu, M., Wang, Q., Gašević, D., & Fan, Y. (2024). A systematic literature review of empirical research on applying generative artificial intelligence in education. *Frontiers of Digital Education*, 1(3), 223–245.