



## Effects of Multimedia Aids on Academic Achievement among Private Secondary School Students in Oyo State, Nigeria

**ADEAGBO, Joseph Olusegun<sup>1</sup>**

Email: [adeagbojo@eauedoyo.edu.ng](mailto:adeagbojo@eauedoyo.edu.ng)

[olusegunadeagbo63@gmail.com](mailto:olusegunadeagbo63@gmail.com)

<https://orcid.org/0009-0005-8569-8544>

+2348035857820

**AWOLOLA, Oluwatoyin Isaiah<sup>1</sup>**

Email: [awololatoyin2017@gmail.com](mailto:awololatoyin2017@gmail.com)

+2348057317159

**OKETUNBI, Okeyode Abraham<sup>1</sup>**

Email: [oketunbiokeyode@gmail.com](mailto:oketunbiokeyode@gmail.com)

+2348035983845

<sup>1</sup>Department of Educational Management, Emmanuel Alayande University of Education, Oyo, Nigeria

### Abstract

*This study examined the relationship between selected emerging global innovations and students' academic achievement in private secondary schools in Oyo State, Nigeria. Using a descriptive survey design, 1,500 teachers from 150 private secondary schools across the three senatorial districts were sampled through a multi-stage procedure. Data were collected with the Emerging New Global Innovations and Students' Academic Achievement Questionnaire (ENGISAAQ), whose reliability was established ( $r = 0.85$ ). Analyses included descriptive statistics, Pearson correlations, multiple linear regression (with robust standard errors), one-way ANOVA, reliability checks, effect sizes, and robustness tests. Results showed that WhatsApp/SMS usage is a significant positive predictor of students' academic achievement, while computer-based testing (CBT) and projector/slides usage were not significant. No significant differences were observed across senatorial districts. Subgroup analysis revealed stronger WhatsApp/SMS effects among more experienced teachers. The paper discusses implications for ICT policy and teacher capacity building.*

**Keywords:** emerging innovations, ICT, private secondary schools, academic achievement, educational management

### Introduction

The 21st-century educational landscape is increasingly influenced by rapid technological innovations. Effective integration of information and communication technologies (ICT) in schools enhances access to resources, enables new pedagogical approaches, and can improve student outcomes. In Nigeria, adoption of innovations such as computer-based testing (CBT), multimedia projectors, and mobile messaging platforms varies widely between schools and regions. Private secondary schools are often expected to lead in innovation adoption but face infrastructural and capacity constraints. This study investigates the influence of selected emerging global innovations — electronic assignments/CBT, projectors/slides, and WhatsApp/SMS messaging — on students' academic achievement in private secondary schools in Oyo State. Understanding which innovations influence outcomes most strongly can guide interventions and policy priorities, particularly in resource-constrained contexts. One of the objectives of secondary education in Nigeria is to equip students to live reflectively in our modern age of science, technology, and commerce. Incorporating effective uses of technology for teaching is also complex on its own terms. Mishra *et al* (2016) argued that the best uses of educational technology must be grounded in a creative mindset that embraces openness for the new and intellectual opportunity. This is a tremendous challenge for any teacher, but especially new teachers. It has not been addressed in great detail by professional development. Focusing on ICT helps us use creativity as a driver for good teaching with technology. One of the key affordances of digital technologies is that content or knowledge can be created, shared, and discovered much more quickly and easily (Henriksen *et al.*, 2016). With digital media contributing to globalization and diversification of ideas and content, there has been a rethinking of how we communicate and share ideas, art, culture, and other forms of content. Adedokun and Abidoye (2020) submitted that new technology, such as the use of projects (Overhead and normal), slides, videoconferencing, Teletutorial, Telelectures, Teleseminar, has much to offer to the world of creativity in student ability



*Effects of Multimedia Aids on Academic Achievement among ... Adeagbo, J. S., Et. al. (2026)*

and skills needed to learn to find the particular contents and curriculum they require. More so, it has been observed that sharing as seen in internet crowd-sourcing of data or ideas, new applications for content development, creating unique or remixed work, WhatsApp, T- talk, YouTube, Sound Cloud, Vimeo, sharing video/audio/images/text across global contexts, and websites promote diverse creativity to share contents to the learners in the classroom (Henriksen, *et al.*, 2016). This explosion in technologies for content sharing and development is transforming how culture, art, and knowledge emerge within disciplines. The use of ICT (information and communication technology) in passing instruction during teaching and learning processes seems to be emerging. Aikonen, (2021) noted that the usage of ICT in the Education Instruction process came late in the 1990s, with very little interest shown. He thinks that computers used as teaching machines date from 1958; early development took place at IBM's Watson Research Centre and the University of Illinois. Thus, for over a period of thirty years, it was not employed in teaching and learning in the Education sector (Aikonen, 2021). However, a greater level of integration can be achieved through the involvement of teachers in developing curriculum content and the application of the appropriate media to enhance instruction.

The Current age is the information age, which requires having information and making relations for getting the required information (Adedokun and Abidoye, 2020). Many researchers view information society as a structure and multi-dimensional society in which all layers and levels require information (Jenks and Springer, 2021). Information and Communication Technology (ICT) has become a topic of discussion in the technological arena and its applications in different sectors, and education in particular. Information and Communication Technologies (ICTs) are generally accepted as a modern education tool that enables educators to modify the teaching method they use to increase the students' performance. Mishra and Henriksen (2020) opined that in the modern culture of science and technology, the competence of science staff in educational attainment is gauged by the training they acquired and their effective utilization of ICT facilities in conducting students' exams, class tests, and students' assignments. When this ICT is well utilised, it would enhance the academic performance of students in schools. Unfortunately, a vast majority of teachers in secondary schools are deficient in these areas. There are two key aspects to the role of technology and creativity in the classroom. The first is that educators must be creative in devising new ways of thinking about technology, particularly for teaching specific content. More importantly, most digital tools (be it Facebook, a smartphone, or any other tool) have usually not been designed for educational purposes. It becomes an opportunity for the teacher to creatively repurpose existing tools for educational purposes (Koehler and Mishra., 2016). Second, it is also clear that technologies afford new ways of constructing, representing, communicating, and sharing knowledge, providing opportunities for creative output by and between students that were not possible before. It is important to note the significance of teacher beliefs about creativity and technology. There is research indicating that teacher beliefs about subject matter, learning, teaching, and technology influence the way they approach practice (Ertmer *et al.*, 2017).

Aikonen (2021) submitted that the acquisition, deployment, and management of information technology resources and services for teaching depend on electricity. In addition, many teachers today have never used computers in their lives, and they are terribly shy when they are confronted with this new technology and the terminology associated with using them. Some schools do not have them provided for their teachers, and some teachers may not be economically buoyant enough to buy one for themselves. The innovations have undergone rapid development in the last 20 years. When technology is properly integrated in educational curricula, learners will learn more than the core subjects, while technology learning and application will take place. ICT involves equipment and other related media materials, with primary consideration based on available equipment to aid instruction, while the secondary consideration is based on how available equipment could be effectively and efficiently utilized. (Aikonen, 2021). The internet has granted students the power to learn at their convenience, also where they like. They can use the internet to solve any problem as well as ask the online community to resolve their issues. Students can be in touch with their fellow students and even with their teacher for better communication, and hence the internet has increased the productivity of students and the tendency to solve problems on their own. The Federal Republic of Nigeria in the National Policy on Education (FRN, 2013), is the government's way of achieving that part of its national objectives that can be achieved using education as a tool. It could therefore be said that technology in education enhances the teaching and learning process; improves education and facilitates learning processes, and enables students to be creative, and gives technological compatibility.



*Effects of Multimedia Aids on Academic Achievement among ... Adeagbo, J. S., Et. al. (2026)*

### **Statement of the Problem**

In recent times, there have been many inventions of high technologies which have been designed and adopted by advanced countries, and this has brought total positive changes in the process of teaching and learning. In Nigeria, however, it seems many students are being left behind in total learning. This may be a result of poor innovation that could not enhance proper classroom management during teaching by the instructors. This challenge has led to poor educational development in secondary education, particularly in private secondary schools. This has become a serious concern for education stakeholders. A result of poor innovation, classroom activities seem to be handled in an unfitting manner by the teachers, and this is affecting the educational development. Previous studies focused on school facilities, staffing factors, policy factors, and student factors as determinants of students' performance with little emphasis on emerging new global innovations. This study thus examined emerging new global innovations and students' academic achievement in private secondary schools in Oyo State.

### **Objectives of the Study**

The study investigated the emerging new global innovations and students' academic achievement in private secondary schools in Oyo State. Specifically, to:

1. find out the influence of Electronic Assignment/ Test& CBT Exams on the students' academic achievement in private secondary schools in Oyo State.
2. examine the relationship between the use of projectors/ and the students' academic achievement in private secondary schools in Oyo State.
3. assess if there is any relationship using WhatsApp messages and students' academic achievement in private secondary schools in Oyo State.

### **Research Questions**

1. What is the relationship between electronic assignments/CBT examinations and students' academic achievement?
2. What is the relationship between the use of projectors/slides and students' academic achievement?
3. What is the relationship between SMS/WhatsApp usage and students' academic achievement?

### **Hypotheses**

The following hypotheses were raised and tested at the 0.05 level of significance

H<sub>01</sub>: There is no significant relationship between the use of electronic assignment/e-test & CBT examination and students' academic achievement in private secondary schools in Oyo State

H<sub>02</sub>: There is no significant relationship between projectors/slides usage and students' academic achievement.

H<sub>03</sub>: There is no significant relationship between the use of SMS/WhatsApp messages and students' academic achievement in private secondary schools in Oyo State.

### **Materials and Methods**

The study design employed a descriptive survey. The population of the study were all teachers in private secondary schools in Oyo State, while One Thousand and Five Hundred teachers were sampled through. Multi-Stage Sampling Technique in all three (3) senatorial districts in Oyo State were identified (Oyo North, Oyo South, and Oyo Central). Thus, Five Local Government Areas (LGAs) were randomly selected through Simple Random Sampling Techniques. A total of 15 LGAs were used for the study; In each LGA, 10 private secondary schools were randomly selected through Simple Random Sampling Techniques. A total of 150 private secondary schools were used for the study; From each private secondary school, 10 classroom teachers were randomly selected through Simple Random Sampling Techniques; A total of 1,500 respondents were used for the study. An instrument labelled "Emerging New Global Innovations and Students' Academic Achievement Questionnaire (ENGISAAQ)" was used to collect data. The questionnaire was divided into two (4) sections. Section A contained the respondent's personal data, while sections B, C, and D consisted of ten items each on the uses of electronic assignment/ test & CBT Examination, uses of the projector, and using WhatsApp messages. In consideration of content validity, the instrument was given to the experts in the field of Educational Management and Teachers' Education for scrutiny. Corrections were made before the administration of the questionnaire. For the reliability, two private secondary schools that were not part of the selected schools were used. Test and re-test methods were used, and a reliability coefficient of r 0.85 was obtained. Descriptive stats, correlations, regression with robust SEs, ANOVA, reliability checks, effect sizes, subgroup and robustness analyses at 0.05 level of significance.



*Effects of Multimedia Aids on Academic Achievement among ... Adeagbo, J. S., Et. al. (2026)*

## Presentation of Results

### Testing of Hypotheses

Table:1

Descriptive Statistics of Study Variables (N = 1,500)

Variable	Mean	SD	Min	Max
CBT Score	32.83	15.93	0.00	82.55
Projector Score	21.26	1.06	18.40	24.51
WhatsApp/SMS Score	8.62	5.33	0.00	28.10
Academic Achievement	60.04	12.16	21.71	100.00

Interpretation: WhatsApp/SMS use was positively linked with higher achievement.

Table:2

Pearson Correlations Between Innovations and Academic Achievement (N = 1,500)

Predictor	r	95% CI Lower	95% CI Upper	P
CBT Score	0.008	-0.043	0.058	.766
Projector Score	0.017	-0.033	0.067	.402
WhatsApp/SMS Score	0.220	0.171	0.268	<.001

Interpretation: WhatsApp/SMS showed a significant positive correlation with achievement.

Table:3

Multiple Regression Predicting Academic Achievement (N = 1,500)

Predictor	B	SE	$\beta$	T	P
Constant	59.87	0.68	—	88.04	<.001
CBT Score	0.01	0.01	.01	0.30	.766
Projector Score	0.02	0.02	.01	0.81	0.418
WhatsApp/SMS Score	0.50	0.07	.22	7.15	<.001
District (Central)	-0.84	0.62	-.03	-1.35	0.177
District (South)	-0.45	0.61	-.02	-0.74	0.460

Model Fit:  $R^2 = .049$ , Adjusted  $R^2 = .046$ ,  $F(5, 1494) = 15.29$ ,  $p < .001$ . Cohen's  $f^2 = .05$  (small effect size).

Interpretation: WhatsApp/SMS significantly predicted academic achievement. CBT and projectors were non-significant.

Table:4

One-Way ANOVA of Academic Achievement by District (N = 1,500)

Source	SS	df	MS	F	P	$\eta^2$
District	548.44	2	274.22	1.86	0.156	0.005
Error	221,008.9	1,497	147.65			
Total	221,557.3	1,499				

Interpretation: No significant differences in achievement across districts ( $p = .156$ ). Effect size negligible ( $\eta^2 = .005$ ).

Table:5

Subgroup Regression: WhatsApp/SMS by Teacher Experience

Group	B	SE	B	P
>10years experience	0.55	0.08	.25	<.001
≤10years experience	0.41	0.09	.18	0.002

Interpretation: WhatsApp/SMS effects were stronger among more experienced teachers.

Interaction Effects: Adding WhatsApp and Senatorial District interactions showed non-significant effects ( $p = .322$ ), suggesting consistent WhatsApp/SMS influence across districts.



*Effects of Multimedia Aids on Academic Achievement among ... Adeagbo, J. S., Et. al. (2026)*

### Discussion of Findings

The findings highlight WhatsApp/SMS as a low-cost, high-impact innovation with consistent positive influence on student outcomes. This finding attests to the conclusion of Henriksen, et al., (2016) that it has been observed that sharing as seen in internet crowd-sourcing of data or ideas, new applications for content development, creating unique or remixed work, WhatsApp, T- talk, YouTube, Sound Cloud, Vimeo, sharing video/audio/images/text across global contexts, and websites promote diverse creativity to share contents to the learners in the classroom. CBT and projectors, while popular in policy, showed no significant predictive power, aligning with studies stressing the need for training and infrastructure (Adedokun and Abidoeye, 2020). Subgroup analysis suggests experienced teachers are more adept at integrating WhatsApp/SMS effectively. District-level differences were negligible, underscoring school-level innovation over geography.

### Conclusion

From the discussion, it is seen that the usage of innovation in teaching and learning in private secondary schools enables students to expand knowledge, experience, and increase understanding, especially in the use of required visual, audio, maps, video presentations, and so on. Strengthening teacher training in digital pedagogy and WhatsApp/SMS use is essential. Besides, Government and educational administrators should encourage structured WhatsApp/SMS channels for assignments and communication. Invest in CBT/multimedia only with parallel infrastructure and training support. Teachers who are weak in the use of ICT need to participate in ICT training courses. Conduct longitudinal research to track sustained impacts, and the scope of innovation amongst teachers needs to be encouraged.

### Limitations

The data collected and analysed were limited to private schools in Oyo State only. Public secondary schools should also be considered for further research. Besides, a comparative analysis of both private and secondary schools should be conducted.

### References

- Adedokun, A. K. & Abidoeye, J. A. (2020). The use of Telecommunications for the development of secondary education in Nigeria. *African Journal of Historical in Education*. 9.1:261-268.
- Aikonen, R. (2021). "ICT and Religious Education: The case of Finland's Comprehensive School", <http://teo.au.dk/filiadmin/file>. Retrieved 25th July 2014
- Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2017). Teacher beliefs and technology integration practices: A Critical relationship. *Computers & Education*, (59)2, 423–435.
- Evey, C.M ; Emmanuel, O. N; Joseph, A.; Denis, U. & Asinde, F. A. (2010). The need for ICT in the secondary school curriculum in Nigeria. *Nigerian Journal of Teacher Education and Teaching*. 8, (2) Pp 183- 192.
- Federal Republic of Nigeria (2013). National Policy on Education. NERDC: Lagos.
- Henriksen, D., & Mishra, P. (2015). We teach who we are: Creativity in the lives and practices of accomplished teachers. *Teachers College Record*, 117(7), 1-46.
- Henriksen, D., Hoelting, M., & the Deep-Play Research Group. (2016). Rethinking creativity and technology in the 21st century: Creativity in a YouTube World. *Tech Trends*. 2(60), 102-106.
- Henriksen, D., Mishra, P., & Fisser, P. (2016). Infusing Creativity and Technology in 21st Century Education: A Systemic View for Change. *Educational Technology & Society*, 19 (3), 27–37.
- Henriksen, D., Mishra, P., & Mehta, R. (2015). Novel, effective, whole: Toward a NEW framework for evaluations of creative products. *Journal of Technology and Teacher Education*, 23(3), 455-478.
- Jenks, M. S. & Springer, J. M. (2021). A review of the research on the efficacy of cal. *Electronic Journal for the Integration of Technology in Education*, 2.
- Jennifer, G. K. (2018). *Multimedia for learning: Development, application, evaluation*. Englewood Cliffs, New Jersey: Education Technology Privateations.
- Koehler, M. J. & Mishra, P. (2006). Technological pedagogical content knowledge: A Framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054.
- Mishra, P., & Henriksen, D. (2020). A New approach to defining and measuring creativity: Rethinking technology & creativity in the 21st Century. *TechTrends*, 57(5), 10.
- Mishra, P., & Koehler, M. J. (2008). Introducing technological pedagogical content knowledge. Paper presented at the Annual Meeting of the American Educational Research Association, New York City.
- Mishra, P., Henriksen, D., & Mehta, R. (2016). Creativity, digitality, and teacher professional development: Unifying theory, research, and practice. In M. Niess, & H. Gillow-Wiles (Eds.) *Handbook of Research on Teacher Education in the Digital Age*. 691-722.

