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THE IMPACT OF TECHNOLOGY-DRIVEN PEDAGOGIES ON SECONDARY SCHOOL LEARNERS' GLOBAL COMPETENCIES IN CALABAR SOUTH LOCAL GOVERNMENT AREA OF CROSS RIVER STATE, NIGERIA.

[1]Ezama, Elizabeth Castro and [2]Peter Otu Akubu
Department of Curriculum Instructional Technology, University of Cross River State (UNICROSS), Calabar.
Department of Educational Foundations, University of Cross River State (UNICROSS), Calabar.
Email: elizabethezama75@gmail.com, Phone number**: 08035157979**

Abstract
The primary objective of this study was to investigate the influence of various learning technologies on the development of global competencies among secondary school students in Calabar South Local Government Area, Cross River State. Specifically, the study aimed to assess the influence of multimedia resources, mobile learning tools, and digital presentation tools on global competencies such as critical thinking, collaboration, communication, digital literacy, and technological fluency. A survey research design was adopted, and data were collected using a structured 4-point Likert-scale questionnaire. A sample of 150 students was selected through stratified random sampling. Data were analyzed using Pearson Product Moment Correlation Coefficient.The findings revealed that multimedia resources significantly enhance students' ability to develop global competencies by improving engagement and fostering critical thinking ($r = 0.76$, $r^2 = 0.58$). Mobile learning tools were found to play a critical role in the acquisition of global competencies such as collaboration and digital literacy ($r = 0.81$, $r^2 = 0.66$). Additionally, digital presentation tools were shown to positively influence students' communication skills and technological fluency ($r = 0.84$, $r^2 = 0.71$). The study concludes that the integration of learning technologies into instructional practices is essential for fostering global competencies among secondary school students. It is recommended that educational stakeholders invest in multimedia resources, mobile learning tools, and digital presentation tools to enhance these competencies. Furthermore, teachers should receive comprehensive training to effectively utilize these technologies, while continuous evaluation and feedback mechanisms should be established to optimize their impact on students' learning outcomes.

Key words: Learning technologies, Global competencies, Multimedia resources, Mobile learning tools, Digital presentation tools**.**

1.0 Introduction

The 21st-century educational landscape demands innovative teaching approaches that equip students with global competencies essential for thriving in a rapidly evolving world. Technology-driven pedagogies, such as multimedia resources, mobile learning tools, and digital presentation platforms, have emerged as key drivers of educational transformation. These approaches enhance critical thinking, collaboration, creativity, and digital literacy, making learning more interactive and engaging. In Nigeria, the integration of technology into education has gained momentum, especially in urban and semi-urban areas, despite challenges such as limited infrastructure and digital divides. However, the extent to which these efforts influence learners' acquisition of global competencies remains underexplored (Ogunode, Jegede, & Musa, 2024).

This study focuses on three critical aspects of technology integration: multimedia resources, mobile learning tools, and digital presentation tools, which were selected for their accessibility and relevance to the semi-urban context of Calabar South LGA. Multimedia resources, which incorporate text, images, video, and audio, enhance learner engagement and comprehension by catering to diverse learning styles. This fosters creativity and improves information retention while developing key competencies such as communication, problem-solving, and digital literacy, which are essential in the 21st century (Akinbo, 2021). Similarly, mobile learning tools provide students with flexible and accessible opportunities to engage with educational content beyond the traditional classroom setting. By enabling real-time collaboration and access to learning materials, mobile learning fosters self-directed learning, time management, and digital communication skills, which are increasingly valued in the global workforce (Eze, 2022).

Furthermore, the adoption of digital presentation tools, such as PowerPoint, Prezi, and interactive whiteboards, enhances the way information is delivered and understood. These tools enable teachers to present lessons in a visually engaging and structured manner while also encouraging students to develop their presentation skills. As a result, learners cultivate essential global competencies, including critical thinking, public speaking, and technological fluency, which are critical for success in the global economy (Abdullahi, 2023). By examining the impact of these technology-driven approaches, this study seeks to provide empirical insights into how multimedia resources, mobile learning tools, and digital presentation platforms contribute to the development of global competencies among secondary school learners in Calabar South LGA.

Multimedia resources, including images, audio, video, and text, enhance learning by engaging students through dynamic content that stimulates cognitive processes. These tools promote critical thinking by encouraging learners to analyze and synthesize information while also refining their problem-solving and decision-making skills (Olaniyan, 2022). Additionally, multimedia fosters collaboration as students work together on digital platforms, improving communication and teamwork, which are crucial global competencies

(Nnamdi, 2021). Onwu, Ononaiwu, Jombo-Mba, and Akaneme (2021) found that multimedia usage significantly enhances academic engagement among undergraduates in Enugu State, Nigeria. Similarly, Bawa and Suleiman (2017) established that multimedia instructional packages significantly improve secondary school students' academic performance in Chemistry, reinforcing the importance of multimedia in fostering critical global competencies.

Mobile learning tools, such as smartphones and tablets, provide flexible access to learning materials, fostering self-directed learning and time management skills. These tools enhance critical thinking by enabling students to engage with diverse resources, collaborate in real time, and develop problem-solving skills essential for global competency (Ibrahim, 2023). Mobile platforms also facilitate digital literacy and teamwork, as students interact across various locations and gain exposure to modern technologies (Ogunyemi, 2022). Sarrab, Al Shibli, and Badrusha (2016) identified technological infrastructure, faculty readiness, and student engagement as key factors influencing mobile learning adoption in Omani higher education. Similarly, Ramadhani and Vicent (2016) found that both teachers and students in Tanzania hold positive perceptions of mobile phone use in teaching, highlighting its role in enhancing instructional effectiveness.

Digital presentation tools, such as PowerPoint and Prezi, enhance learning by encouraging students to organize, synthesize, and present information creatively, strengthening critical thinking and analytical skills (Eze, 2021). These tools also improve communication skills and technological fluency, as students gain experience in presenting ideas effectively, a vital competency for global engagement (Chukwu, 2022). Eze (2021) demonstrated that students trained in digital presentation tools showed significant improvements in critical thinking and organizational skills. Likewise, Chukwu (2022) found a strong relationship between digital presentation tool usage and students' communication skills and technological fluency in Lagos State, Nigeria. These findings emphasize the need for schools to integrate digital presentation tools into curricula to enhance students' global competencies.

The integration of technology into secondary education in Nigeria is essential for equipping students with global competencies; however, a significant gap exists in the effective adoption of technology-driven pedagogies in regions like Calabar South LGA, Cross River State. While multimedia resources, mobile learning tools, and digital presentation tools have been recognized for enhancing critical thinking, collaboration, digital literacy, and problem-solving, their actual impact on secondary school learners in this context remains underexplored. Furthermore, inadequate infrastructure, limited technology access, and insufficient professional development for teachers hinder effective implementation, potentially depriving learners of opportunities to develop essential 21st-century skills. Existing studies focus primarily on higher education or more technologically advanced regions, leaving a lack of empirical evidence on how these

digital tools influence secondary school learners in resource-constrained environments. This study, therefore, seeks to fill this gap by examining the extent to which these pedagogical tools contribute to global competency development, providing insights for policymakers, administrators, and educators to enhance technology integration in secondary education.

1.1 Research Objectives

This study aims to:

i. Assess the relationship between multimedia resources and the development of global competencies among secondary school learners in Calabar South LGA.
ii. Evaluate the relationship between mobile learning tools and the acquisition of global competencies such as critical thinking, collaboration, and digital literacy among secondary school students in Calabar South LGA.
iii. Examine the relationship between digital presentation tools and the enhancement of communication and technological fluency in secondary school learners in Calabar South LGA.

1.2 Research Questions

i. To what extent do multimedia resources relate to the development of global competencies among secondary school learners in Calabar South LGA?
ii. To what extent do mobile learning tools relate to the acquisition of global competencies, such as critical thinking, collaboration, and digital literacy, among secondary school students in Calabar South LGA?
iii. To what extent do digital presentation tools relate to communication and technological fluency among secondary school learners in Calabar South LGA?

1.3 Research Hypotheses

i. There is no significant relationship between multimedia resources and the development of global competencies among secondary school learners in Calabar South LGA.
ii. There is no significant relationship between mobile learning tools and the acquisition of global competencies, such as critical thinking, collaboration, and digital literacy, among secondary school students in Calabar South LGA.
iii. There is no significant relationship between digital presentation tools and the enhancement of communication and technological fluency among secondary school learners in Calabar South LGA.

2.0 Method

The study adopted a descriptive research design with a correlational approach. The population of the study comprised 683 secondary school students in Calabar South LGA (301 males and 382 female). The sample size for the study was 150 students, with the sample distribution of male and female students proportionally derived from the total population. Stratified random sampling was used to select the participants, ensuring representation from both male and female students in the study. The instrument used for data collection was a structured questionnaire titled “Technology-Driven Pedagogies and Global Competencies Questionnaire (TPGCQ)”. The questionnaire

was designed to assess the three key variables of the study: the use of multimedia resources in teaching, the integration of mobile learning tools, and the adoption of digital presentation tools. The instrument was validated by experts in the fields of educational technology and measurement and evaluation. Feedback from the experts, including suggestions for modifications and improvements, informed the final selection of items on the questionnaire. To ensure the reliability of the instrument, a pilot study was conducted with 30 students from a different school in Calabar South LGA, and the Cronbach Alpha method was used to calculate the reliability coefficient. The overall reliability coefficient of the instrument was 0.85, which indicated good internal consistency. Data collected by the researchers were analyzed using Pearson Product Moment Correlation Coefficient (PPMC) to examine the relationship between the independent variables (use of multimedia resources, integration of mobile learning tools, and adoption of digital presentation tools) and global competencies (critical thinking, collaboration, and digital literacy) among secondary school students.

3.0 RESULTS AND DISCUSSION

The results of the data analyzed are presented in tables below and are discussed subsequently.

Hypothesis One: There is no significant relationship between multimedia resources and the development of global competencies among secondary school learners in Calabar South LGA.

Table 1: Summary of Pearson Product Moment Correlation (r) analysis of the relationship between multimedia resources and the development of global competencies (N=150).

Variables	N	r	r^2	P-value	Decision
Multimedia Resources	150				
		0.76	0.58	0.000	Significant
Development of Global Competencies	150				

Table 1 shows that the relationship between multimedia resources and the development of global competencies was 0.76. This indicates a strong positive correlation, suggesting that the use of multimedia resources significantly influences the development of competencies such as critical thinking, collaboration, and digital literacy among secondary school learners in Calabar South LGA, as evidenced by the p-value of 0.000, which is less than the 0.05 significance threshold, confirming the statistical significance of this relationship. The coefficient of determination of 0.58 implies that 58% of the variation in the development of global competencies can be attributed to the availability and use of multimedia resources. Based on this result, the null hypothesis is rejected.

Hypothesis Two: There is no significant relationship between mobile learning tools

and the acquisition of global competencies, such as critical thinking, collaboration, and digital literacy, among secondary school students in Calabar South LGA.

Table 2: Summary of Pearson Product Moment Correlation (r) analysis of the relationship between mobile learning tools and the acquisition of global competencies (N=150).

Variables	N	r	r^2	P-value	Decision
Mobile Learning Tools	150				
		0.81	0.66	0.000	Significant
Acquisition of Global Competencies	150				

Table 2 reveals a strong positive correlation of 0.81 between mobile learning tools and the acquisition of global competencies. This suggests that mobile learning tools significantly contribute to the enhancement of critical thinking, collaboration, and digital literacy among secondary school students in Calabar South LGA, as evidenced by the p-value of 0.000, which is well below the 0.05 significance threshold, indicating a statistically significant relationship. The coefficient of determination of 0.66 indicates that 66% of the variation in the acquisition of global competencies is explained by the use of mobile learning tools. Based on this result, the null hypothesis is rejected.

Hypothesis Three: There is no significant relationship between digital presentation tools and the enhancement of communication and technological fluency among secondary school learners in Calabar South LGA.

Table 3: Summary of Pearson Product Moment Correlation (r) analysis of the relationship between digital presentation tools and the enhancement of communication and technological fluency (N=150).

Variables	N	r	r^2	P-value	Decision
Digital Presentation Tools	150				
		0.84	0.71	0.000	Significant
Communication and Technological Fluency	150				

Table 3 shows a high positive correlation of 0.84 between digital presentation tools and the enhancement of communication and technological fluency. This finding indicates that the use of digital presentation tools significantly enhances learners'

communication skills and technological fluency, as evidenced by the p-value of 0.000, which is less than the 0.05 significance threshold, confirming the statistical significance of this relationship. The coefficient of determination of 0.71 implies that 71% of the variation in communication and technological fluency is due to the utilization of digital presentation tools. Consequently, the null hypothesis is rejected.

4.0 Discussion of Findings

The study's first finding revealed that there is a significant relationship between multimedia resources and the development of global competencies, such as critical thinking, collaboration, and digital literacy, among secondary school learners in Calabar South LGA. This finding aligns with the study by Onwu et al. (2021), who examined the influence of multimedia usage on academic engagement among university undergraduates in Enugu State, Nigeria. Their findings showed that multimedia usage positively influences academic engagement by making learning more interactive and engaging. Similarly, Bawa and Suleiman (2017) demonstrated that multimedia instructional packages significantly enhance students' academic performance in Chemistry compared to traditional teaching methods. These studies highlight the transformative potential of multimedia in improving learner engagement and fostering competencies essential for global citizenship. The consistency of these findings underscores the need for the strategic incorporation of multimedia resources into the secondary school curriculum to nurture critical global skills among learners.

The study's second finding, that mobile learning tools is significantly related to the acquisition of global competencies, such as critical thinking, collaboration, and digital literacy, among secondary school learners, is supported by the study of Sarrab et al. (2016). Their research identified technological infrastructure, faculty readiness, and student engagement as critical factors in the successful adoption of mobile learning in Omani higher education. Additionally, Ramadhani and Vicent (2016) found that mobile phones, as ICT teaching tools, are positively perceived by both teachers and students for enhancing teaching and learning. These findings reinforce the role of mobile learning tools in providing flexible and accessible learning environments, which in turn facilitate the acquisition of critical global competencies. The alignment of these studies with the present findings emphasizes the importance of investing in mobile learning infrastructure and training programs to maximize their potential in fostering global competencies among students.

The study's third finding, that digital presentation tools are significantly related to communication and technological fluency among secondary school learners in Calabar South LGA, corroborates the findings of Eze (2021). Eze’s study demonstrated that digital presentation tools significantly improve students' critical thinking and organizational skills, which are foundational to effective communication and technological fluency. Similarly, Chukwu (2022) reported a significant relationship between the use of digital presentation tools and the enhancement of students' communication skills and technological fluency in Lagos

State, Nigeria. These findings collectively highlight the effectiveness of digital presentation tools in preparing students for technology-driven communication and organizational tasks. The alignment of these studies with the current findings underscores the necessity of integrating digital presentation tools into secondary school curricula to develop students' competencies in communication and technological fluency.

5.0 Conclusion

This study indicated that there a significant relationship between multimedia resources, mobile learning tools, digital presentation technologies and the development of global competencies among secondary school learners in Calabar South Local Government Area. The findings align with existing empirical literature, confirming that these technologies play a pivotal role in fostering critical thinking, collaboration, communication, and digital literacy skills essential for thriving in a globally interconnected world.

The first finding revealed that multimedia resources significantly enhance students' engagement and global competencies by creating an interactive and dynamic learning environment. This aligns with the view that multimedia stimulates active participation and critical thinking, crucial for academic success and global readiness. The second finding underscored the influence of mobile learning tools on fostering flexibility and accessibility, which are vital for collaboration and continuous learning. Lastly, the third finding established the effectiveness of digital presentation tools in enhancing communication skills and technological fluency, equipping students with essential competencies for both academic and professional success.

Generally, this study highlighted the necessity of integrating these technologies into educational practices to better prepare learners for the demands of a globalized knowledge economy. The findings also call for continued investment in technological infrastructure and comprehensive training programs for teachers to maximize the benefits of these tools. By addressing the diverse learning needs of students, these technologies not only enhance educational outcomes but also contribute to building a globally competent and empowered generation.

Recommendations

In light of the findings of this study, the following recommendations were proposed:

i. **Increased Investment in Educational Technology:** The government and educational authorities in Cross River State should prioritize the allocation of resources for the acquisition and implementation of multimedia resources, mobile learning tools, and digital presentation technologies in schools. By equipping classrooms with these tools, educators can foster a more dynamic and interactive learning environment that supports the development of students' global competencies, including critical thinking, collaboration, and communication skills.

ii. **Comprehensive Training for Educators:** Regular and detailed training programs should be organized

for teachers to enhance their proficiency in integrating multimedia, mobile learning, and digital presentation tools into classroom instruction. These training sessions should focus on both the technical use of these technologies and pedagogical strategies for leveraging them to maximize student engagement and learning outcomes. This approach will ensure that teachers are well-prepared to use these tools effectively to enhance students' competencies.

iii. **Sustained Support and Evaluation:** Educational authorities should establish mechanisms for ongoing support and monitoring of the use of educational technologies in schools. This includes providing technical assistance, conducting periodic evaluations of the impact of these tools on student outcomes, and addressing challenges as they arise. Regular feedback from both students and teachers should also be collected to identify areas for improvement and adapt the technologies to better suit the learning needs of students.

iv. **Curriculum Integration:** Schools should work towards embedding the use of multimedia resources, mobile learning tools, and digital presentation technologies into their curriculum. This will not only enhance students' learning experiences but also prepare them with essential skills for navigating a technology-driven global economy.

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