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EFFECT OF DIGITAL LEARNING TOOLS ON ACADEMIC PERFORMANCE OF BUSINESS EDUCATION STUDENTS IN FEDERAL COLLEGE OF EDUCATION (TECHNICAL), OMOKU

Dr. Uzoma Onita
Department of Marketing Education
School of Business Education, Federal College of Education (Technical),
Omoku, Rivers State, Nigeria

Abstract
This study examined the effect of digital learning tools on the academic performance of Business Education students in Federal College of Education (Technical), Omoku. Two research questions and two null hypotheses were used to address the specific objectives. A correlational research design was adopted. The population of the study comprised 575 Business Education undergraduate students in Federal College of Education (Technical), Omoku, from which a sample size of 236 was developed using Taro Yamane formula for sample size determination. Data were collected using a structured questionnaire titled *Digital Learning Tools and Academic Performance Questionnaire (DLTAPQ)*. The instrument was validated by experts, and its reliability was established using Cronbach's Alpha method. 212 copies of the instruments were filled out and returned correctly. Data collected were analyzed using Pearson Product Moment Correlation to answer the research questions and test the hypotheses at 0.05 level of significance through the aid of Statistical Package for Social Sciences (SPSS) software version 26.0. Findings revealed that virtual classrooms have a moderate positive and significant relationship with academic performance of Business Education students. Educational software was also found to have a moderate positive and significant relationship with academic performance. The study concludes that digital learning tools play a crucial role in enhancing teaching and learning of Business Education. It was recommended among others that institutional management provide adequate digital infrastructure to improve students' academic performance.

Keywords: Digital learning tools, virtual classrooms, educational software academic performance

Introduction
The integration of digital learning tools into the educational system has fundamentally transformed how students engage with academic content and how educators deliver instruction. In the context of business education, these changes are particularly pronounced due to the subject's practical and dynamic nature. This study seeks to explore the effect of digital learning tools on the academic performance of business education students at the Federal College of Education (Technical), Omoku. This focus is timely and relevant given the rapid technological advancements and the growing need for digital literacy in the modern workforce (World Economic Forum, 2023).

Digital learning tools, which include online platforms, educational software, and interactive multimedia resources, offer numerous benefits. These tools can enhance access to educational materials, provide personalized learning experiences, and increase student engagement (Almeida &Simoes, 2022). However, while there is a broad consensus on the potential advantages of digital learning, there is also a critical need to empirically evaluate their actual impact on academic performance, especially in specialized fields such as business education. This study aims to address this gap by examining how these tools affect the learning outcomes of business education students, who require a unique combination of theoretical knowledge and practical skills.

The Federal College of Education (Technical), Omoku, serves as an ideal setting for this research due to its commitment to leveraging technology to enhance its educational offerings. As an institution that prioritizes technical and vocational education, the college has invested in digital

infrastructure to support its diverse academic programs. Despite these advancements, there remains a lack of empirical data on how these digital tools influence student performance, particularly in business education. This study aims to provide this much-needed data, thereby contributing to the optimization of digital learning strategies within the institution (Nwosu et al., 2023).

Business education students face unique challenges in their academic journey, often requiring proficiency in complex software and applications relevant to their field. Tools such as accounting software, business simulation programs, and data analysis applications are integral to their curriculum. Mastery of these tools is not only essential for academic success but also for future employability in a competitive job market (Chen et al., 2023). This study will investigate how effectively these digital tools are integrated into the curriculum and their subsequent impact on student performance, providing insights that could help educators and administrators better support their students.

The increasing reliance on digital learning tools in education necessitates a thorough understanding of their impact on student outcomes. This study will explore the effects of these tools on the academic performance of business education students at the Federal College of Education (Technical), Omoku. By focusing on the specific needs and experiences of these students, the research aims to offer valuable insights into how digital learning can be optimized to enhance educational outcomes. The findings are expected to have significant implications for the development of effective digital learning strategies, contributing to improved educational practices and student success in an increasingly digital world (Johnson & Wong, 2023).

Statement of the Research Problem

The rapid adoption of digital learning tools in educational settings has sparked considerable debate regarding their efficacy in enhancing student academic performance. At the Federal College of Education (Technical), Omoku, the integration of these tools into the business education curriculum has been extensive, driven by the need to equip students with the necessary digital skills for the modern workforce. However, despite the institution's significant investments in digital infrastructure, there is limited empirical evidence to substantiate the impact of these tools on students' academic outcomes. This gap in knowledge presents a critical challenge for educators and policymakers who must make informed decisions regarding the continued use and optimization of digital learning technologies.

Moreover, business education students face unique challenges that may affect the efficacy of digital learning tools. The curriculum not only requires a solid understanding of theoretical concepts but also demands proficiency in practical applications such as accounting software, business simulations, and data analysis tools. These students must navigate complex digital environments to gain skills essential for their future careers. However, the lack of comprehensive studies evaluating how effectively these digital tools facilitate learning in this specific context raises concerns about their true impact on academic performance. Without robust data, it is difficult to determine whether these tools are genuinely enhancing learning or simply adding layers of complexity that may hinder students' progress.

Furthermore, existing research often generalizes the effects of digital learning tools across diverse educational settings, neglecting the distinct needs and contexts of specialized fields like business education. This oversight results in a one-size-fits-all approach that may not address the unique challenges faced by business education students at the Federal College of Education (Technical), Omoku. Therefore, there is an urgent need for targeted research that investigates the specific impact of digital learning tools on the academic performance of these students. This study aims to fill this critical gap by providing empirical evidence that will inform educational strategies, ensuring that digital learning tools are effectively utilized to support and enhance the academic success of business education students in this institution.

Purpose of the Study

The purpose of this study was to examine the effect of digital learning tools on the academic performance of Business Education students in Federal College of Education (Technical), Omoku. Specifically, the study sought to:

1. Determine the relationship between **virtual classrooms** and academic performance of Business Education students.
2. Determine the relationship between **educational software** and academic performance of Business Education students.

Research Questions

The following research questions guided this paper:

1. What is the relationship between virtual classroom and academic performance of business education students in Federal College of Education (Technical), Omoku?
2. What is the relationship between educational software and academic performance of business education students in Federal College of Education (Technical), Omoku?

Research Hypotheses

The following null hypotheses were tested using 0.05 level of significance as a benchmark:

H_{01}: There is no significant relationship between virtual classrooms and academic performance of business education students in Federal College of Education (Technical), Omoku.

H_{02}: There is no significant relationship between educational software and academic performance of business education students in Federal College of Education (Technical), Omoku.

Review of Related Literature

Literature was reviewed on the followings:

Concept of Digital Learning Tools

Digital learning tools refer to technological resources used to support teaching and learning activities in modern educational environments. These tools include online learning platforms, educational software, virtual classrooms, multimedia resources and mobile learning applications designed to improve instructional delivery and students' learning outcomes. The integration of digital learning tools in education has become increasingly important as institutions seek to provide flexible and accessible learning opportunities (Veletsianos & Houlden, 2020). These tools support different teaching approaches such as blended learning and collaborative learning, which encourage active participation among students.

One major benefit of digital learning tools is their ability to support personalized learning. Many digital platforms provide feedback and learning activities that are tailored to individual students' needs. Through adaptive learning systems, students can progress at their own pace while receiving immediate feedback on their learning tasks (Picciano, 2022). Interactive features such as quizzes, simulations and multimedia presentations also help students understand complex concepts more easily and enhance their engagement with learning activities.

Digital learning tools also improve access to educational resources. Students can access lecture materials, assignments and discussions online regardless of location or time. This flexibility is particularly useful in higher education where students may have different schedules and responsibilities. Hrastinski (2021) notes that online learning platforms promote continuous learning by allowing students to review course materials outside the classroom. However, the effectiveness of digital learning tools depends on the availability of infrastructure, internet connectivity and the digital competence of both educators and students (Bond et al., 2021).

Concept of Academic Performance

Academic performance refers to the level of achievement students attain in their educational activities within a specific period. It is usually measured through examinations, assignments,

projects and other forms of assessment. Academic performance is commonly expressed in grades or grade point averages and reflects how well students achieve their learning objectives (Schneider & Preckel, 2017).

Research indicates that academic performance is influenced by several factors including cognitive ability, motivation, emotional stability and social support. Cognitive skills such as memory, reasoning and problem-solving help students perform well in academic tasks. In addition, motivation and resilience enable students to overcome academic challenges and remain committed to their studies (Bücker et al., 2018). Support from lecturers and peers also contributes significantly to students' academic success.

With the introduction of digital technologies in education, the evaluation of academic performance has expanded beyond traditional methods. Digital learning platforms now provide opportunities for continuous assessment and instant feedback. These systems allow lecturers to monitor students' progress and identify learning difficulties early (West, 2020). However, challenges such as limited digital literacy and unequal access to technology may affect the effectiveness of technology-based assessments. Means et al. (2020) therefore emphasize that digital tools should complement traditional evaluation methods rather than replace them.

Virtual Classrooms and Academic Performance

Virtual classrooms are online learning environments that allow lecturers and students to interact in real time through video conferencing, chats and collaborative digital tools. They simulate traditional classroom interactions while allowing learning to occur remotely. The use of virtual classrooms increased significantly during the COVID-19 pandemic as institutions adopted online teaching to ensure continuity of learning (Dhawan, 2020).

Virtual classrooms can positively influence academic performance by providing flexible and accessible learning environments. Students can attend lectures, participate in discussions and access instructional materials from different locations. Interactive features such as breakout rooms, live chats and digital whiteboards encourage student participation and collaboration, which enhance engagement and learning outcomes (Martin & Bolliger, 2018).

In addition, virtual classrooms allow the integration of multimedia resources such as videos and presentations that help simplify complex concepts. These tools make learning more engaging and can improve students' understanding and retention of course content. However, challenges such as unstable internet connections, lack of digital devices and inadequate digital skills may hinder effective participation in virtual classrooms (Bond et al., 2021). When these challenges are addressed, virtual classrooms can significantly improve students' academic performance.

Educational Software and Academic Performance

Educational software refers to computer applications developed to support teaching and learning activities. Examples include word processing programs, spreadsheets, accounting packages and business simulation software commonly used in Business Education programmes. These tools enable students to practice practical skills and apply theoretical knowledge in real-life contexts (Chou et al., 2021).

One important advantage of educational software is its ability to provide immediate feedback to students. Through interactive exercises and assessments, students can quickly identify errors and improve their understanding of course materials. The data generated by these software tools also enables lecturers to monitor students' progress and provide targeted support where necessary (Heppen et al., 2017).

Educational software further promotes collaborative learning through discussion forums, group projects and shared digital platforms where students can exchange ideas and solve problems together. Such interactions help students develop critical thinking, communication and teamwork skills that are essential for academic success (Chen et al., 2020).

Despite these benefits, the effectiveness of educational software depends on factors such as access to technology, digital literacy and the quality of the software itself. Limited access to

computers or internet connectivity can restrict students' ability to benefit fully from these tools (Roblyer & Hughes, 2019). Therefore, proper infrastructure, training and institutional support are necessary to maximize the benefits of educational software in improving students' academic performance.

Theoretical Foundation

This paper was anchored on the technology acceptance model.

Technology Acceptance Model

The Technology Acceptance Model (TAM), developed by Davis (1989), explains how users adopt and use new technologies. It identifies perceived ease of use the belief that technology requires minimal effort and perceived usefulness the belief that technology enhances performance as the primary factors influencing adoption. If users find a technology easy to use and beneficial, they are more likely to integrate it into their routine activities.

In business education, TAM provides insights into the adoption of digital learning tools, such as educational software, virtual classrooms, and interactive multimedia. Students' perceptions of ease of use and usefulness influence engagement and academic performance (Davis et al., 2022). By understanding these perceptions, educators can identify barriers, improve interfaces, provide training, and demonstrate benefits, thereby enhancing students' adoption and effective utilization of digital tools. TAM thus guides both the prediction of technology acceptance and strategies to maximize its impact on learning outcomes (Venkatesh & Bala, 2022).

Empirical Review

Smith et al. (2018) investigated the use of tablet computers in improving literacy development among primary school students in rural Kenya. The study adopted a mixed-method design combining quantitative reading assessments with qualitative interviews involving students and teachers. Tablets containing educational learning software were provided to an experimental group while a control group continued using traditional textbooks. Literacy tests were administered periodically to measure students' progress in reading fluency and comprehension. The findings revealed that students who used the tablets demonstrated significant improvement in reading ability and motivation compared with those who relied on conventional learning materials. Teachers also reported that the use of educational software created a more engaging learning environment and improved student participation. However, the study identified challenges such as unstable electricity supply and internet connectivity which affected effective technology utilization. The authors recommended increased access to digital learning tools and continuous teacher training to ensure effective integration of technology into teaching practices.

Johnson (2019) examined the impact of technology-supported classroom instruction on students' academic engagement and performance in Nairobi secondary schools. The study involved five schools where three schools adopted digital classroom technologies while two schools used conventional teaching approaches. Data were collected through pre- and post-instructional tests, student focus group discussions, and teacher interviews. The results showed that students exposed to technology-supported instruction demonstrated improved understanding of academic concepts and participated more actively during lessons. Teachers also reported that digital tools made it easier to explain complex topics and enhance interaction during classroom activities. The study concluded that technology-enhanced classroom environments can significantly improve students' academic outcomes when properly integrated into teaching practices. The author recommended that schools invest more in digital classroom facilities and teacher training to promote effective technology-based instruction.

Thompson (2022) explored the influence of e-learning platforms on students' academic performance across urban and rural schools in Kenya. The study utilized technology usage logs, academic performance records, and interviews with students and teachers to determine how access to digital learning platforms affects learning outcomes. The findings indicated that students who had regular access to e-learning platforms performed better academically than

those with limited access. The study also revealed that internet availability, teacher competence in digital instruction, and students' attitudes toward technology significantly influenced the effectiveness of digital learning tools. Thompson emphasized the need for improved technological infrastructure and professional development programmes for teachers to maximize the benefits of digital learning in schools.

Knowledge Gap

Despite the growing body of research on digital learning technologies, limited empirical studies have specifically examined their impact on the academic performance of Business Education students at the Federal College of Education (Technical), Omoku. Most existing studies focus on general education contexts without considering the unique characteristics of business education programmes in teacher training institutions. Consequently, there is insufficient localized evidence to guide the effective integration of digital learning tools within this academic environment.

Furthermore, previous research has rarely examined how specific digital learning tools such as virtual classrooms and educational software influence the academic performance of business education students. Understanding the relationship between these tools and students' learning outcomes is essential for improving instructional delivery and enhancing academic achievement. Addressing this gap will therefore provide valuable insights for educators and policymakers on the effective use of digital learning tools in business education programmes.

Methodology

This study examined the effect of digital learning tools on the academic performance of Business Education students in Federal College of Education (Technical), Omoku. Two research questions and two null hypotheses were used to address the objectives of the study. A correlational research design was adopted. The population of the study comprised 575 Business Education undergraduate students in Federal College of Education (Technical), Omoku, from which a sample size of 236 was developed using Taro Yamane formula for sample size determination. Data were collected using a structured questionnaire titled *Digital Learning Tools and Academic Performance Questionnaire (DLTAPQ)*. The instrument was validated by experts, and its reliability was established using Cronbach's Alpha method. Two hundred and twelve copies of the instruments were correctly filled and returned. Data collected were analyzed using Pearson Product Moment Correlation to answer the research questions and test the hypotheses at 0.05 level of significance through the aid of Statistical Package for Social Sciences (SPSS) version 26.0.

RESULTS AND DISCUSSION

Research question one

What is the relationship between virtual classroom and academic performance of business education students in Federal College of Education (Technical), Omoku?

Table 1: Analysis of Responses to Research Question One

		Virtual classroom	Academic Performance
Virtual classroom	Pearson Correlation	1	.373**
	Sig. (2-tailed)		.000
	N	212	212
Academic performance	Pearson Correlation	.373**	1
	Sig. (2-tailed)	.000	
	N	212	212

**. Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Output, 2025.
Table 1 shows a Pearson correlation coefficient (r = 0.373) between virtual classrooms and academic performance of Business Education students, with a significance value of 0.000. This indicates a moderate positive and statistically significant relationship (p < 0.01). The result implies that increased use of virtual classroom platforms enhances students' academic performance in Federal College of Education (Technical), Omoku.

Research question Two
What is the relationship between educational software and academic performance of business education students in Federal College of Education (Technical), Omoku?
Table 2: Analysis of Responses to Research Question Two

		Educational Software	Academic Performance
educational software	Pearson Correlation	1	.455**
	Sig. (2-tailed)		.000
	N	212	212
Academic performance	Pearson Correlation	.455**	1
	Sig. (2-tailed)	.000	
	N	212	212

**. Correlation is significant at the 0.01 level (2-tailed).
Source: SPSS Output, 2025.

Table 2 shows a Pearson correlation coefficient (r = 0.455) between educational software and academic performance, with a significance value of 0.000. This indicates a moderate positive and statistically significant relationship. The result implies that increased use of educational software enhances understanding of course content, improves practical skills, and contributes to better academic performance among Business Education students.

Research Hypotheses
The following null hypotheses was tested using 0.05 level of significance as a benchmark:
Hypotheses One
H_{01}: There is no significant relationship between virtual classrooms and academic performance of business education students in Federal College of Education (Technical), Omoku.
Table 4: Pearson Product Correlation Coefficient on Virtual Classroom and Academic Performance

		Virtual classroom	Academic performance
Virtual classroom	Pearson Correlation	1	.373**
	Sig. (2-tailed)		.000
	N	212	212
Academic performance	Pearson Correlation	.373*	1
	Sig. (2-tailed)	.000	
	N	212	212

**. Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation analysis shows r = 0.373 with a p-value of 0.000 < 0.01. Therefore, the null hypothesis is rejected. This means that there is a significant relationship between virtual classrooms and academic performance of Business Education students.

Hypotheses Two

H_{02}: There is no significant relationship between educational software and academic performance of business education students in Federal College of Education (Technical), Omoku.

Table 5: Pearson Product Correlation Coefficient on Virtual Classroom and Academic Performance

		Educational Software	Academic performance
Educational Software	Pearson Correlation	1	.455**
	Sig. (2-tailed)		.000
	N	212	212
Academic performance	Pearson Correlation	.455*	1
	Sig. (2-tailed)	.000	
	N	212	212

**. Correlation is significant at the 0.01 level (2-tailed).

The Pearson correlation result indicates r = 0.455 with a p-value of 0.000 < 0.01. Consequently, the null hypothesis is rejected. This implies that there is a significant relationship between educational software and academic performance of Business Education students.

Discussion of Findings

The findings of the study revealed that virtual classrooms have a positive and significant relationship with the academic performance of Business Education students in Federal College of Education (Technical), Omoku. The implication of this finding is that the use of virtual classroom platforms enhances students' participation, improves access to learning materials, and facilitates interaction between students and lecturers. Virtual classroom technologies allow synchronous and asynchronous learning which supports flexible learning environments and improves students' understanding of course content. This finding supports Dhawan (2020) who observed that virtual classroom systems improve instructional delivery and students' learning outcomes.

The study also revealed that educational software has a positive and significant relationship with students' academic performance. Educational software enables students to practice concepts, receive immediate feedback, and develop problem-solving skills relevant to business education courses such as accounting, commerce, and office technology. The availability and effective use of such software therefore contribute to improved academic achievement among students.

Summary of Findings

The study investigated the effect of digital learning tools on the academic performance of Business Education students in Federal College of Education (Technical), Omoku. Based on the analysis of data and testing of hypotheses, the following findings were made:

1. There is a moderate positive and significant relationship between virtual classrooms and academic performance of Business Education students. Increased use of virtual classroom platforms enhances students' access to learning materials, interaction, and participation, which improves their academic performance.
2. There is a moderate positive and significant relationship between educational software and academic performance of Business Education students. The utilization of software applications for learning supports practical skill development and improves students'

understanding of business concepts, leading to better academic outcomes.

CONCLUSION

The study concludes that digital learning tools such as virtual classrooms and educational software significantly enhance the academic performance of Business Education students in Federal College of Education (Technical), Omoku. The integration of these digital tools into teaching and learning processes improves students' engagement, accessibility to learning resources, and overall academic outcomes.

RECOMMENDATIONS

Based on the findings, recommendations made are as follows:

1. Management of Federal College of Education (Technical), Omoku should provide adequate virtual classroom infrastructure to support effective teaching and learning.
2. Lecturers should integrate educational software into Business Education courses to enhance students' academic performance.

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