

INFLUENCE OF DIGITAL INSTRUCTIONAL MATERIALS ON TEACHING AND LEARNING OUTCOMES IN BUSINESS EDUCATION: EVIDENCE FROM TERTIARY INSTITUTIONS IN KWARA STATE NIGERIA

BY

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Abstract

Digital instructional materials have become indispensable for successful teaching and learning in higher education, particularly in professionally oriented fields like Business Education. This study investigated the impact of digital instructional resources on teaching and learning outcomes in Business Education, using data from two tertiary institutions in Kwara State, Nigeria: Kwara State University (Kwasu), Malete, and the University of Ilorin (Unilorin). The study focused on the impact of Learning Management Systems (LMS), interactive slide instructional materials, and collaborative tutoring tools. A descriptive survey research design was used. The demographic included Business Education lecturers and undergraduate students from both universities, and a stratified random selection method was used to choose 142 respondents. A standardized and validated questionnaire was used to collect data, and reliability was determined using Cronbach's alpha. The study questions were answered using mean and standard deviation, and the hypotheses were tested using independent samples t-tests at the 0.05 level of significance. The study found that Learning Management Systems (LMS) improved access to instructional materials, lecturer-student interactions, and structured course delivery. Interactive slide instructional materials simplified complicated concepts, boosted learner engagement, and enhanced information retention, and collaborative tutoring tools encouraged peer connection, involvement, and problem-solving abilities. Hypothesis testing revealed no statistically significant variations in respondents' perceptions between Kwasu and Unilorin. The study suggests that digital instructional resources greatly increase teaching and learning results in Business Education and advocates continuous lecturer training and institutional support for digital instructional practices.

Keywords: Digital Instructional Materials, Educational Technology, Learning Management Systems, Business Education, Digital Learning Tools.

Introduction

The rapid progress of digital technologies has radically transformed instructional practices in higher education globally. The delivery of instruction has changed from primarily lecture-based methods to more interactive, learner-centered, and flexible learning environments thanks to digital resources like electronic textbooks, learning management systems (LMS), multimedia presentations, interactive simulations, online videos, collaborative platforms, and adaptive learning software (Haleem et al., 2022). From a constructivist learning perspective, these technologies encourage active knowledge construction by enabling learners to connect with content, classmates, and instructors in ways that promote meaning-making rather than passive information reception. Through asynchronous access, multimodal information delivery, and immediate feedback, digital instructional materials encourage deeper cognitive processing, critical thinking, and long-term memory (Haleem et al., 2022).

Despite policy-level support for digital transformation, the use of digital instructional resources in Nigerian higher education institutions is hampered by significant systemic impediments. These include inconsistent power supply, expensive expenses of devices and internet data, limited broadband coverage, outdated ICT infrastructure, insufficient technical support systems, and low levels of digital literacy among both teachers and students (Jummai, 2021). From a socio-technical systems perspective, these restrictions highlight how technology innovation cannot flourish in isolation from supportive organizational, infrastructural, and human-capacity systems. Consequently, many institutions experience superficial adoption, where digital technologies are present but underutilized or deployed in ways that do not materially impact teaching practices or learning outcomes (Jummai, 2021). Within Kwara State, both Kwara State University (KWASU), Malete and the University of Ilorin (UNILORIN) provide essential institutional contexts for exploring how digital instructional resources perform in genuine teaching and learning circumstances within public higher education. Evidence from resource-constrained environments indicates that the presence of digital infrastructure alone does not guarantee pedagogical effectiveness, even though both universities have implemented learning management systems, online communication channels, and varying degrees of multimedia-supported instruction (Eze et al., 2022). Rather, consistent with the TPACK and TAM frameworks, effective integration depends on lecturers' confidence and skill in using digital technologies, students' readiness and access, stable connectivity, and persistent institutional support (Eze et al., 2022; Babalola & Genga, 2024). Differences in institutional culture, leadership agendas, and resource allocation further necessitate a multi-institutional approach to assessing utilisation patterns and instructional impact.

Global and continental research indicates that digital instructional resources can greatly boost student motivation, conceptual understanding, and academic achievement when enabling conditions are implemented (Haleem et al., 2022). From a development policy standpoint, investments in digital education infrastructure and teacher capacity-building are expected to produce significant returns in terms of completion rates and graduate employability, especially when equity-focused measures address affordability and access (World Bank, 2023). However, constructivist and technology-acceptance theories warn that learning gains are mediated by how technologies are perceived, adopted, and integrated in pedagogical practice, emphasizing the significance of context-specific empirical evidence. A large study gap therefore continues about the influence of digital teaching resources inside Business Education curricula in Nigerian public universities, especially outside major urban centres. Although research on digital adoption has increased since the COVID-19 pandemic, few studies have looked into how availability, accessibility, utilization intensity, and perceived pedagogical value interact in specific disciplinary and institutional contexts (Eze et al., 2022; Babalola & Genga, 2024). Without such data, institutional decisions risk being directed by assumptions rather than theory-informed and empirically based insights. Against this backdrop, the present study analyzes the influence of digital instructional resources on the teaching and learning of Business Education courses in two public universities in Kwara State (Kwara State University, Malete and the University of Ilorin). The study, which is guided by constructivist learning theory, the Technology Acceptance Model, and the TPACK framework, investigates the availability and accessibility of digital instructional materials, patterns and extent of use by lecturers and students, perceived benefits for instructional effectiveness and skill acquisition, and the challenges that limit effective integration, as well as viable mitigation strategies. In order to improve the quality and labor-market relevance of business education in Nigeria's changing digital landscape, the study aims to inform curriculum enhancement, faculty development initiatives, infrastructure planning, and evidence-based policy formulation by producing theory-informed, context-sensitive evidence from two institutions.

Purpose of the Study

- i. To determine the influence of Learning Management System LMS based instructional materials on the teaching and learning of business education courses in Kwara State Institutions.
- ii. To examine the influence of interactive slide instructional materials on the teaching and learning of business education courses in Kwara State Institutions.
- iii. To investigate the influence of collaborative tutoring tools on the teaching and learning of business education courses in Kwara State Institutions.

Research Questions

- i. What influence do Learning Management System LMS instructional materials have on the teaching and learning of business education courses in Kwara State Institutions?
- ii. What impact does interactive slide instructional materials have on the teaching and learning of business education courses in Kwara State Institutions?
- iii. What influence do collaborative tutoring tools have on the teaching and learning of business education courses in Kwara State Institutions?

Research Hypotheses

- H₀₁: There is no significant difference in the mean responses of Kwasu and Unilorin respondents regarding the influence of LMS based instructional materials on the teaching and learning of business education courses.
- H₀₂: There is no significant difference in the mean responses of Kwasu and Unilorin respondents regarding the influence of interactive slide instructional materials on the teaching and learning of business education.
- H₀₃: There is no significant difference in the mean responses of Kwasu and Unilorin respondents regarding the influence do collaborative tutoring tools have on the teaching and learning of business education courses.

Literature Review

Digital learning is the purposeful use of information and communication technology (ICT) to enhance teaching, learning, and evaluation outside of traditional classroom limits. It encompasses fully online, blended, hybrid, and mobile learning strategies offered via learning management systems, virtual classrooms, multimedia resources, and collaborative platforms (Zou et al., 2025). In higher education, digital learning has progressed from an emergency response during the COVID-19 epidemic to a strategic mechanism for increasing access, flexibility, and learner-centered instruction (Adedoyin & Soykan, 2020). Globally, digital learning promotes personalized learning, active knowledge production, and ongoing interaction between students, teachers, and content. Multimedia and interactive tools provide self-paced learning, timely feedback, and increased conceptual understanding, in line with constructivist and social constructivist learning principles (Haleem et al., 2022). Adoption in Nigeria has increased in response to post-pandemic reforms, but difficulties such as inconsistent power supply, high data costs, restricted broadband access, and uneven digital literacy continue to hinder efficacy (Haruna, 2021). Empirical research reveals that successful digital learning is heavily reliant on institutional support, lecturer preparation, and infrastructure reliability, especially in Business Education, where alignment with technology-driven workplaces is critical (Amaonye & Anyaeji, 2023).

A Learning Management System (LMS) is a digital platform for managing, delivering, monitoring, and evaluating teaching and learning activities in online and blended settings. It allows lecturers to organize content, create

assessments, manage communication, and track student progress, while students can access materials, submit assignments, receive feedback, and participate in conversations (Al-Fraihat et al., 2020). LMS platforms allow structured e-learning in a variety of formats, including readings, videos, quizzes, and interactive multimedia. During the COVID-19 epidemic, institutions turned from face-to-face instruction to online and blended models to maintain academic continuity, resulting in a rapid uptake of LMS platforms in higher education. Asynchronous access, automated assessment, discussion forums, and learning analytics all contribute to increased flexibility, engagement, and data-driven instruction (Singh et al., 2021). However, in underdeveloped countries, effective LMS use is determined by infrastructure availability, digital literacy, and institutional support, with constraints such as inconsistent connectivity and inadequate instructor training limiting impact (Bizzo, 2022). LMS platforms in Business Education enhance experiential learning by using case studies, simulations, collaborative projects, and continuous evaluation to prepare students for technology-mediated business environments (Ali, 2020). Instructional materials are the resources and media that educators utilize to improve teaching effectiveness and students' grasp of the subject matter. They include printed texts, visual aids, audiovisual resources, physical artifacts, and digital tools like multimedia presentations, simulations, and learning management systems. Well-designed teaching materials organize information, reduce cognitive burden, and encourage active participation (Clark & Mayer, 2021). Advances in digital technology have altered higher education instructional materials by allowing the incorporation of multimedia features such as graphics, animations, narration, and integrated assessments, which improve comprehension and retention, particularly for complicated content. The COVID-19 epidemic enhanced the use of digital instructional tools, such as recorded lectures, interactive slides, and online discussion forums, to continue teaching during institutional closures (Adedoyin & Soykan, 2020). Although studies at African institutions show that efficient use of instructional resources leads to increased engagement and understanding, infrastructural restrictions and digital skill gaps continue to impact usage (Galle et al., 2020).

Interactive slide teaching materials are multimedia-rich digital presentations that use text, graphics, animations, videos, hyperlinks, and embedded quizzes to encourage active learning. Unlike static slides, they enable for non-linear navigation, learner involvement, and immediate feedback. They are often created with applications like PowerPoint, Google Slides, Prezi, and Canva. Based on multimedia learning theory, interactive slides improve learning by mixing words and graphics in ways that minimize cognitive load and facilitate information processing (Mayer, 2021). Interactive features like interactive diagrams, quizzes, and branching situations promote active engagement and are consistent with constructivist learning approaches (Clark & Mayer, 2021). Interactive slides are very useful in Business Education for visualizing financial processes, business models, and case-based decision-making, and when connected into LMS systems, they enable blended and self-paced learning (Dhawan, 2020). Business Education is a subfield of vocational and technical education that integrates academic knowledge with practical skills needed for employment, entrepreneurship, and economic engagement. It provides learners with skills in accounting, management, marketing, entrepreneurship, business communication, and office technology, ensuring conceptual knowledge and industry relevance (Alonta, 2021). In Nigeria, Business Education is an essential component of the Technical and Vocational Education and Training (TVET) framework, and it is meant to develop trained workers with ethical values, technical adaptation, and entrepreneurial capacity. Its goals include improving functional occupational skills, increasing self-employment, cultivating ethical business practices, and stimulating creativity and innovation (Chigozie, 2023). The curriculum's interdisciplinary approach develops multi-skilled graduates who can work in a variety of economic sectors (Sulaimon, 2023). In the digital age, the relevance of business education is increasingly dependent on the integration of ICT tools and digital learning techniques that are matched with modern company operations, such as data analytics, e-commerce, and enterprise technologies (Oni &

Ngongpah, 2025). Based on functionalist and constructivist theories, Business Education emphasizes practical relevance, active learning, and real-world application.

Galle et al. (2020) investigated the impact of instructional materials on students' academic performance in quantitative economics at colleges of education in North-West Nigeria. Using a cross-sectional survey of 1,085 participants from seven institutions, the study discovered that instructional resources were widely unavailable and infrequently used during instruction. Despite this constraint, the study found a strong beneficial association between instructional materials and student academic achievement. The study indicated that insufficient provision and usage of instructional materials impair effective teaching and learning, and it advocated increased availability and mandatory use to improve academic results. Brady and Reilly (2020) investigated how Learning Management Systems (LMS) affect academic work practices in higher education through a qualitative interview-based study. The study found that academics largely used LMS platforms for content storage and assessment management, with little interest in interactive or pedagogically creative features. The study revealed that, while LMS platforms have revolutionary potential, their impact on teaching practices is limited in the absence of proper institutional support and professional development. Dambo and Kayii (2020) explored the use of open educational resources (OER) to enhance Business Education instructional content at Rivers State universities. The study identified no significant variations in the utilization of online tutorials and digital learning items among 38 Business Education teachers from two institutions. The findings revealed that, while OER were available, their educational potential remained underutilized. The study suggested a more intentional integration of OER to improve instructional delivery in Business Education. Edionwe (2023) examined the impact of new technologies on instructional delivery in Business Education programmes at Delta State higher education institutions. Using survey data from 437 instructors and students, the researchers discovered that modern technology improved teaching efficacy and enhanced students' learning experiences. The study indicated that technology integration improves instructional delivery and suggested ongoing institutional support and capacity building for lecturers. Asysyura et al. (2023) used a quasi-experimental method to investigate the effect of interactive multimedia on students' cognitive learning results. The study discovered a statistically significant improvement in cognitive function among pupils exposed to interactive multimedia versus those taught traditional methods. The study found that interactive multimedia was well-accepted by learners and helpful in improving cognitive learning outcomes.

Furqon et al. (2023) did a literature study on how LMS usage affects students' learning outcomes and attitudes in higher education. The review found that LMS platforms improve academic achievement significantly by enhancing access to teaching resources, facilitating structured collaboration, and allowing for continuous assessment. Students also reported good attitudes toward LMS use because of its flexibility and support for independent learning. The study suggested a more deliberate educational integration of LMS elements. Opiah and Obasi (2023) evaluated the impact of digital switch-over technologies on Business Education instruction delivery in South-South Nigerian colleges of education. Using survey data from 154 lecturers, the study discovered a strong link between digital technology usage and improved instructional delivery. Respondents said digital tools improved content presentation, student engagement, and overall teaching effectiveness. To maximize educational effects, the study advised that lecturers receive continual digital skills training. Wariowei and Banabo (2024) used a correlational methodology to investigate the association between digital information resources and business education delivery in Bayelsa State's tertiary institutions. The study found a modest association between e-book resources and instructional delivery, but a high positive relationship between e-journal resources and instructional delivery. The study stated that digital information resources are critical for increasing instructional quality, and it suggested focused training for lecturers

as well as better institutional administration of e-journal materials. Zhou et al. (2025) used a mixed-method experimental design to explore the impact of blended interactive digital resources on academic achievement in Business Education. The findings revealed that students exposed to blended interactive resources performed much better academically than those who used traditional online materials, albeit performance varied depending on students' digital competence. The study showed that blended interactive digital resources improve learning outcomes in Business Education and advocated for intentional integration alongside learner support systems.

Closely related with constructivism is social constructivist theory, which highlights learning as a socially mediated process. Digital technologies such as collaboration platforms, discussion forums, and shared workspaces promote peer contact, discourse, and collaborative problem-solving, thereby expanding learning beyond the actual classroom. These affordances are particularly essential in higher education situations where learners are expected to engage in reflective discourse and applied problem-solving. Empirical syntheses reveal that technology-supported collaborative learning settings greatly boost student engagement, motivation, and conceptual understanding when effectively integrated into instructional design (Haleem et. al, 2022). The COVID-19 pandemic significantly expedited the deployment of digital instructional materials globally, requiring universities to convert fast to emergency remote teaching. In Nigeria, the abrupt shutdown of campuses in March 2020 forced the widespread usage of platforms such as Zoom, Google Meet, Microsoft Teams, Moodle, and social messaging tools to sustain teaching, evaluation, and lecturer–student connection (Adedoyin & Soykan, 2020). While these tools permitted instructional continuity, the crisis exposed profound structural inequities in access to technology, institutional preparation, and digital competence (Adedoyin & Soykan, 2020). From the standpoint of the Technology Acceptance Model (TAM), these problems directly influence users' perceived usefulness and perceived ease of use—two critical drivers of whether lecturers and students effectively adopt digital teaching materials beyond emergency circumstances. The requirement for effective digital integration is particularly obvious in professionally oriented subjects such as Business Education, where curriculum relevance is intimately tied with changing workplace technologies. Enterprise resource planning systems, cloud-based accounting platforms, e-commerce infrastructures, data analytics tools, and artificial intelligence-driven decision-support systems are all becoming more and more important in modern corporate operations. Preparing graduates for such situations involves instructional approaches that align technical tools, pedagogical strategies, and content knowledge. The Technological Pedagogical Content Knowledge (TPACK) framework offers a useful perspective on this alignment, arguing that effective technology integration occurs when lecturers have not only subject-matter expertise and pedagogical competence, but also the ability to integrate appropriate technologies to support learning objectives. Studies in Nigerian and analogous contexts indicate that insufficient integration of these knowledge domains relates to skills mismatches and hinders graduate employment in a digitizing economy (Olokundun et al., 2022).

Methodology

This study adopted a quantitative research approach to examine the influence of digital instructional materials on teaching and learning in Business Education programmes. A descriptive survey research design was employed to obtain empirical data on lecturers' and students' perceptions of the use of digital instructional materials, including Learning Management Systems (LMS), interactive slide instructional materials, and collaborative tutoring tools. The population of the study comprised Business Education lecturers and undergraduate students from Kwara State University, Malete and the University of Ilorin. Using a stratified random sampling technique, a total of 142 respondents, consisting of lecturers and students of 300L and 400L were selected to ensure adequate representation

of both institutions and respondent categories. Data were collected using a structured and validated questionnaire designed to measure the availability, utilization, and perceived influence of digital instructional materials on teaching effectiveness and learning outcomes. Responses were rated on a four-point Likert scale. The reliability of the instrument was established through a pilot study, with internal consistency confirmed using Cronbach's alpha. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics, including mean and standard deviation, were used to answer the research questions, while independent samples *t*-tests were employed to test the hypotheses at the 0.05 level of significance. The results were interpreted to determine the extent to which digital instructional materials influence instructional delivery and learning experiences in Business Education.

Results

Table 1: Mean and Standard Deviation of respondents on the influence of Learning Management System (LMS) instructional materials on teaching and learning of business education courses.

S/N	Item	Mean ($\bar{x}$)	SD	Decision
1	LMS platforms such as Google Classroom or Moodle are used regularly in my courses.	3.18	0.84	Agreed
2	LMS helps me access lecture notes and materials easily.	3.42	0.76	Agreed
3	LMS improves communication between lecturers and students.	3.27	0.88	Agreed
4	LMS enhances my understanding of Business Education topics.	3.15	0.91	Agreed
5	LMS supports timely submission of assignments and tasks.	3.36	0.79	Agreed
6	LMS provides opportunities for interactive learning activities.	3.09	0.93	Agreed
7	Using LMS helps me stay organized with course content.	3.33	0.82	Agreed
8	LMS makes it easier for lecturers to deliver structured lessons.	3.25	0.87	Agreed
9	LMS encourages self-paced learning among students.	3.12	0.96	Agreed
10	LMS has improved the overall teaching and learning experience in Business Education.	3.38	0.74	Agreed
Grand Mean		3.26	0.85	Agreed

According to Table 1, respondents concurred that instructional resources from Learning Management Systems (LMS) have a good impact on business education course instruction and learning. With a grand mean of 3.26, all items had mean values above the decision benchmark, suggesting that LMS usage was generally seen favorably. In particular, respondents concurred that LMS platforms improve timely assignment submission, systematic course delivery, lecturer-student communication, and access to learning resources. A significant degree of consistency in respondents' opinions is suggested by the comparatively moderate standard deviation numbers.

Table 2: Mean and Standard Deviation of respondents on the influence of interactive slide instructional materials on the teaching and learning of business education courses.

S/N	Item	Mean ($\bar{x}$)	SD	Decision
1	Interactive slides are used frequently during Business Education lessons.	2.94	0.91	Agreed
2	Interactive slides simplify difficult ideas and concepts.	3.21	0.87	Agreed
3	Multimedia elements such as charts, videos, and audio improve understanding.	3.07	0.93	Agreed
4	Interactive slides make lessons more engaging.	3.18	0.89	Agreed
5	Interactive slide presentations help me remember lessons better.	3.12	0.85	Agreed
6	The use of interactive slides increases my concentration during class.	2.98	0.94	Agreed
7	Interactive slides allow practical illustration of real business situations.	3.25	0.88	Agreed
8	Interactive slides support better communication of key points in lessons.	3.16	0.92	Agreed
9	Interactive slides help clarify complex business processes.	3.09	0.90	Agreed
10	Interactive slides improve the quality of lesson delivery in Business Education.	3.28	0.86	Agreed
Grand Mean		3.13	0.90	Agreed

The grand mean of 3.13 in Table 2 shows that respondents felt that interactive slide instructional materials have a favorable impact on the teaching and learning of Business Education courses. The mean values for every item were higher than the acceptability threshold, indicating a generally positive opinion of the usage of interactive slides during education. According to the research, interactive slides are thought to make complex ideas easier to understand, increase student engagement, improve comprehension through multimedia components, and provide more effective transmission of important topics. Particularly high mean values were recorded for items pertaining to the practical illustration of actual business scenarios and the overall quality of the lecture, underscoring the educational potential of interactive slides.

Table 3: Mean and Standard Deviation of respondents on the influence do collaborative tutoring tools have on the teaching and learning of business education courses.

S/N	Item	Mean ($\bar{x}$)	SD	Decision
1	Collaborative digital tools such as Zoom groups or Google Docs are used in my classes.	2.88	0.97	Agreed
2	Collaborative tutoring helps me understand difficult topics better.	3.14	0.90	Agreed
3	Online group discussions improve my learning in Business Education.	3.09	0.93	Agreed
4	Working with others through digital platforms increases my participation.	3.22	0.88	Agreed
5	Collaborative tools help me share ideas with classmates easily.	3.17	0.86	Agreed

S/N	Item	Mean ($\bar{x}$)	SD	Decision
6	Online collaborative work helps me develop problem solving skills.	3.05	0.95	Agreed
7	Collaborative tutoring improves communication between group members.	3.11	0.91	Agreed
8	Collaborative tools help me complete group assignments more effectively.	3.19	0.89	Agreed
9	Collaborative tutoring increases my confidence in class activities.	2.97	0.94	Agreed
10	Collaborative tutoring positively influences my academic performance	3.23	0.87	Agreed
Grand Mean		3.10	0.91	Agreed

A grand mean of 3.10 in Table 3 indicates that respondents agreed that collaborative tutoring technologies have a good impact on the teaching and learning of Business Education courses. The mean scores for every item were higher than the decision benchmark, indicating a generally favorable opinion of the use of collaborative digital technologies in education. The findings show that collaborative teaching tools improve students' comprehension of challenging subjects, involvement, communication, idea sharing, and successful group assignment completion. The importance of collaborative tools in enhancing academic achievement, learning confidence, and problem-solving abilities was also recognized by respondents. A modest and acceptable degree of consistency in respondents' thoughts is suggested by the standard deviation numbers.

Testing of Hypotheses

H₀₁: There is no significant difference in the mean responses of KWASU and UNILORIN respondents regarding the influence of LMS based instructional materials on the teaching and learning of business education courses.

Table 4: Independent Samples t Test for LMS Influence

Institution	N	Mean ($\bar{x}$)	SD	t cal	t crit	Sig p	Sig. (p)	Decision
Kwasu	71	3.25	0.41	-1.24	1.96	0.22	0.16	Not Significant
Unilorin	71	3.41	0.38					
Grand Mean = 3.28								

Decision: Since the calculated p value 0.22 is greater than 0.05, the null hypothesis H₀₁ is retained.

The independent samples t-test analysis comparing the mean responses of respondents from Kwara State University (KWASU) and the University of Ilorin (UNILORIN) regarding the impact of instructional materials based on learning management systems (LMS) on the teaching and learning of business education courses is shown in Table 4. The two institutions' mean answer scores ($\bar{x} = 3.25$ and $\bar{x} = 3.41$) were strongly correlated, suggesting that respondents' opinions about the usage of LMS instructional materials were similar. The observed difference in mean responses is not statistically significant, as indicated by the computed p-value (0.22), which is higher than the 0.05 level of significance. As a result, the null hypothesis (H₀₁) is accepted. This finding suggests that respondents from KWASU and UNILORIN have similar opinions on how LMS-based teaching resources affect business education

instruction and learning. The results point to a similar level of LMS integration and efficacy as well as a common experience between the two schools.

Ho₂: There is no significant difference in the mean responses of KWASU and UNILORIN respondents regarding the influence of interactive slide instructional materials on the teaching and learning of business education courses.

Table 5: Independent Samples t Test for Interactive Slide Influence

Institution	N	Mean ($\bar{x}$)	SD	t-cal	t-crit	Sig. (p)	Decision
Kwasu	71	3.12	0.39	-1.23	1.96	0.35	Not Significant
Unilorin	71	3.28	0.42				
Grand Mean = 3.14							

Decision: Since the calculated p value 0.22 is greater than 0.05, the null hypothesis H₀₂ is retained.

The mean responses of respondents from Kwara State University (KWASU) and the University of Ilorin (UNILORIN) regarding the impact of interactive slide instructional materials on the teaching and learning of Business Education courses do not differ statistically significantly, as Table 5 demonstrates. The mean score of UNILORIN respondents was somewhat higher ($\bar{x} = 3.28$) than that of KWASU respondents ($\bar{x} = 3.12$), but the difference was not statistically significant ($p = 0.35 > 0.05$). This result suggests that respondents from both universities had comparable opinions about how effective interactive slide teaching resources are. It implies that KWASU and UNILORIN have similar levels of exposure to and educational benefits from the use of interactive slides in business education.

Ho₃: There is no significant difference in the mean responses of KWASU and UNILORIN respondents regarding the influence do collaborative tutoring tools have on the teaching and learning of business education courses in Kwara State University, Malete.

Table 6: Independent Samples t Test for Collaborative Tutoring Influence

Institution	N	Mean ($\bar{x}$)	SD	t-cal	t-crit	Sig. (p)	Decision
Kwasu	71	3.09	0.44	-1.20	1.96	0.23	Not Significant
Unilorin	71	3.26	0.47				
Grand Mean = 3.11							

Decision: Since the calculated p-value (0.23) is greater than 0.05, the null hypothesis (H₀₃) is retained.

Table 6 shows that there is no statistically significant difference in the mean replies of respondents from Kwara State University (KWASU) and the University of Ilorin (UNILORIN) about the impact of collaborative tutoring tools on the teaching and learning of Business Education courses. The mean score was somewhat higher for respondents from UNILORIN ($\bar{x} = 3.26$) than for those from KWASU ($\bar{x} = 3.09$), but the difference was not statistically significant ($p = 0.23 > 0.05$). This result implies that respondents from both universities have comparable opinions about how successful collaborative teaching technologies are. It suggests that KWASU and UNILORIN's use of collaborative digital tools in business education is similar, as is their educational impact.

Discussion

This study assessed the influence of digital instructional material on teaching and learning outcomes in Business Education, utilizing evidence from two tertiary institutions in Kwara State, Nigeria, Kwara State University (KWASU), Malete and the University of Ilorin (UNILORIN). The study specifically examined the impact of Learning Management Systems (LMS), interactive slide instructional materials, and collaborative tutoring tools at both universities. The findings provide empirical evidence for the emerging consensus that digital instructional resources play a significant role in enhancing instructional delivery and learning effectiveness in contemporary Business Education programmes. The findings revealed that Learning Management Systems have a positive impact on Business Education teaching and learning by improving access to instructional materials, strengthening lecturer-student communication, promoting structured lesson delivery, and facilitating timely academic task submission. This conclusion corroborates Furqon et al. (2023), who demonstrated that LMS platforms boost academic performance by offering flexible access to learning resources and supporting continuous assessment. It also resonates with Brady and Reilly (2020), who stated that although LMS platforms are occasionally underutilized, they remain useful tools for arranging instructional content and managing assessment processes. The implication of this study is that persistent and deliberate usage of LMS platforms can considerably increase instructional organization and learner support. Consequently, schools should prioritize continual professional development for lecturers to foster deeper pedagogical engagement with LMS features, particularly interactive and feedback-oriented systems.

Beyond LMS usage, the study further demonstrated that interactive slide instructional materials increase teaching and learning by clarifying complicated concepts, enhancing learner engagement, improving concentration, and promoting better memory of instructional content. This finding is similar with Asysyura et al. (2023), whose experimental investigation indicated that interactive multimedia greatly improves students' cognitive learning outcomes. It also supports Dambo and Kayii (2020), who stressed the instructional benefit of digital learning objects, particularly interactive presentations, in improving Business Education curriculum. The conclusion of this research is that multimedia-enriched and interactive slide presentations might improve conceptual clarity, particularly in abstract and process-oriented Business Education courses. Institutions should consequently encourage instructional design methods that blend animations, real-life business illustrations, and formative evaluations into slide presentations to boost learning effectiveness. In addition, the findings suggested that collaborative tutoring tools favorably enhance teaching and learning by fostering peer interaction, enhancing problem-solving skills, increasing student participation, and supporting the effective completion of group assignments. This result coincides with Zhou et al. (2025), who indicated that blended interactive digital tools boost learning results in Business Education, while variances in learners' digital adaptability may influence performance. The positive opinions recorded in the present study show that collaborative digital tools promote social learning and build academic confidence among students. The conclusion of this study is that collaborative tutoring tools can develop active learning, teamwork, and communication skills important for both Business Education and the modern workplace. Universities should consequently integrate collaborative digital platforms into instructional preparation and provide students with structured coaching on efficient online cooperation.

Furthermore, hypothesis testing found no statistically significant variations in the perspectives of respondents from KWASU and UNILORIN regarding the influence of LMS platforms, interactive presentations, and collaborative tutoring tools. This finding shows a shared awareness of the pedagogical relevance of digital instructional materials

across both institutions. It validates earlier studies by Dambo and Kayii (2020) and Wariowei and Banabo (2024), which revealed consistent agreement on the instructional benefits of digital tools. The lack of significant institutional differences implies that digital instructional practices and perceived benefits are relatively consistent across the two universities, opening up possibilities for cross-institutional collaboration, policy harmonization, and shared professional development initiatives to strengthen digital pedagogy in Business Education programs. The findings confirm earlier empirical evidence that current digital technologies boost instructional delivery and learning outcomes in Business Education (Edionwe, 2023; Opiah & Obasi, 2023). The present study reveals that when digital instructional materials are effectively incorporated, they contribute considerably to effective teaching, greater student engagement, and enriched learning experiences. Consequently, the study underlines the need for persistent investment in digital infrastructure, continual capacity building for lecturers, and institutional policies that enable the pedagogical integration of digital instructional resources. Such measures are vital for ensuring that Business Education programmes stay responsive to the demands of a technology-driven market and capable of creating digitally proficient graduates.

Conclusion

The findings explicitly show that digital instructional resources have a large and beneficial impact on instructional delivery, learner engagement, and learning effectiveness in Business Education at both institutions. The study revealed that LMS platforms improve access to instructional resources, strengthen lecturer-student communication, enable structured course delivery, and allow for timely submission of academic projects. Interactive slide instructional materials were shown to simplify complicated ideas, boost learner engagement, and improve information retention, whilst collaborative tutoring tools improved peer interaction, problem-solving skills, participation, and group assignment completion. Importantly, the study found no significant variations in respondents' evaluations of KWASU and UNILORIN, demonstrating that both universities recognize the pedagogical usefulness of digital teaching materials.

Recommendations

- i. Tertiary institutions should strengthen the usage of Learning Management System (LMS)-based instructional materials through continual training for Business Education lecturers and orientation for students to enhance effective teaching and learning.
- ii. Business Education lecturers should continuously deploy interactive slide instructional tools to explain complicated topics, boost learner engagement, and assist better understanding of course content.
- iii. Collaborative tutoring tools should be actively included into Business Education education to increase peer interaction, active engagement, and problem-solving abilities among students..

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