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Integrating Blended Learning in Tertiary Institutions: Mathematics Teachers' and Students' Perspective

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Abstract
This study examined the perspectives of students and teachers on the integration of blended learning in tertiary institutions in Kwara State, Nigeria. The study was motivated by the increasing adoption of technology-driven instructional approaches in higher education and the growing need to understand stakeholders' experiences within blended learning environments. A descriptive survey research design was adopted for the study. The population consisted of lecturers and students from selected tertiary institutions in Kwara State, while a total of 320 respondents comprising 80 lecturers and 240 students participated in the study through a multi-stage sampling procedure. Data were collected using a researcher-designed questionnaire titled *Blended Learning Integration Questionnaire (BLIQ)*. The instrument was validated by experts in computer education and educational technology, while a reliability coefficient of 0.81 was obtained using Cronbach's alpha method. Data collected were analyzed using mean, standard deviation, and independent samples t-test. The findings revealed that both students and lecturers had positive perceptions toward blended learning integration. The study further showed no significant difference between students' and teachers' perceptions regarding the benefits of blended learning. However, a significant difference existed in the perceived challenges affecting implementation between universities and colleges of education. The study concluded that blended learning can improve teaching and learning effectiveness when supported with adequate infrastructure and institutional commitment.

Keywords: Blended learning, Tertiary institutions, Students' perception, Teachers' perception, Educational technology

Introduction

The growing influence of digital technology in education has continued to reshape teaching and learning practices across the world. In higher education, institutions are increasingly combining face-to-face instruction with online learning activities in what is commonly referred to as blended learning. Blended learning is generally understood as the integration of traditional classroom interaction with digital platforms and online instructional resources in order to improve teaching effectiveness, learner participation, and flexibility in learning delivery (Anthony Jr *et al*., 2022) [6,7]. Over the last decade many universities and teacher training institutions have gradually moved away from purely conventional teaching methods toward technology-supported instructional approaches. This transition became even more noticeable after the COVID-19 pandemic, when educational institutions were compelled to explore remote and hybrid learning alternatives to sustain academic activities.

In many developed countries, blended learning has become an established instructional approach in higher education due to its perceived ability to support collaborative learning, learner autonomy, and improved academic engagement. Studies conducted in different regions have shown that blended learning creates opportunities for flexible access to learning materials, improves communication between teachers and students, and supports individualized learning experiences (Ayob *et al*., 2023; Han, 2025) [8, 13]. Similarly, Verpoorten *et al*. (2022) [20] observed that faculty members in higher education increasingly view blended learning as an important strategy for improving instructional delivery and classroom interaction. Students also tend to appreciate the flexibility and accessibility associated with online-supported learning environments, especially where learning management systems and digital resources are effectively integrated into course delivery (Yu *et al*., 2023) [22].

Despite these growing advantages, the adoption and implementation of blended learning have not been uniform across countries and institutions. In many developing nations, including Nigeria, tertiary institutions still struggle with inadequate technological infrastructure, unstable electricity supply, poor internet connectivity, insufficient digital competence among lecturers and students, and weak institutional support systems. Brenya (2024) [9] noted that institutions in developing countries often encounter structural and economic challenges that limit the successful implementation of blended learning initiatives. Similar concerns were raised by Ali (2025), who identified inadequate training, resistance to change, and institutional barriers as major obstacles affecting teachers' willingness to adopt blended learning approaches.

In Nigeria, the discussion around blended learning has become more relevant because of the increasing pressure on tertiary institutions to modernize instructional delivery and improve educational quality. Colleges of education, polytechnics, and universities are expected to prepare graduates who can function effectively in a digital society. This expectation is particularly important in teacher education institutions where future teachers are trained. If student-teachers are not adequately exposed to technology-driven instructional practices during their training, it may become difficult for them to integrate such approaches effectively in their future classrooms. Consequently, the integration of blended learning in Nigerian tertiary institutions is no longer merely an innovation; it is gradually becoming a necessity.

Although several tertiary institutions in Nigeria have introduced some form of online learning platforms and virtual instructional support, the extent of integration remains inconsistent. Some institutions mainly rely on social media applications such as WhatsApp and Telegram for communication and assignment distribution, while others have attempted to institutionalize learning management systems like Moodle and Google Classroom. However, many lecturers still depend heavily on traditional lecture methods, with minimal integration of digital learning tools. In some cases, students participate in online learning activities without adequate guidance or institutional coordination. These realities suggest that blended learning implementation in many Nigerian tertiary institutions is still evolving and may not yet have achieved the expected level of effectiveness.

Another important issue relates to the perception of both teachers and students regarding blended learning. Perception plays a significant role in technology adoption because positive attitudes often influence willingness to use digital instructional methods. Anthony Jnr (2022) [6,7] found that academic staff attitudes toward blended learning are strongly linked to institutional support, perceived usefulness, and ease of technology use. Likewise, Wu and Luo (2022) [21] reported that students' and teachers' perceptions of blended learning significantly affect participation and learning outcomes. When lecturers perceive blended learning as difficult, time-consuming, or ineffective, they may resist its implementation. Similarly, students who lack digital skills or access to internet facilities may develop negative attitudes toward online-supported learning activities.

In recent years, studies from different countries have continued to explore factors influencing blended learning adoption, effectiveness, and sustainability. Mohammadi *et al*. (2025) [14] emphasized the importance of institutional support, teacher assistance, and appropriate learning platforms in enhancing students' motivation in blended learning environments. Sanders and Mukhari (2024) [17] also observed that lecturers' perception of blended learning is influenced by technological readiness and institutional culture. In addition, ElSayad (2024) [11] found that students' learning perception within blended learning environments is connected to interaction quality, social presence, and instructional design.

While these studies have contributed significantly to understanding blended learning practices globally, there is still limited empirical evidence focusing specifically on tertiary institutions in Kwara State, Nigeria. Most available studies in the Nigerian context tend to focus broadly on e-learning or ICT integration without paying adequate attention to the perspectives of both students and teachers regarding blended learning implementation. Moreover, many international studies are situated in contexts where technological infrastructure and institutional support are relatively advanced compared to the realities in many Nigerian institutions. As a result, findings from those environments may not fully explain the experiences of students and lecturers in Nigerian tertiary institutions.

There is also a practical gap relating to institutional readiness and implementation strategies. Although blended learning is frequently discussed in educational policy and academic discourse, many institutions still lack clear implementation frameworks, regular digital training for lecturers, and adequate learning support systems for students. Ali and Georgiou (2025) argued that successful institutional adoption of blended learning requires systematic planning, staff development, and continuous evaluation. However, such coordinated implementation processes are often weak or inconsistent in many Nigerian institutions. This creates uncertainty regarding how students and lecturers perceive current blended learning practices and whether such practices are meeting instructional expectations.

The present study therefore becomes necessary because it seeks to examine the perspectives of both students and teachers on blended learning integration in tertiary institutions within Kwara State, Nigeria. Understanding these perspectives is important because educational reforms are more likely to succeed when the experiences and concerns of the major stakeholders are properly understood. Findings from the study may help institutional administrators, curriculum planners, and policymakers identify areas

requiring improvement in the implementation of blended learning strategies. The study may also contribute to existing literature on technology-driven instructional practices in Nigerian higher education.

Furthermore, this study is important because many tertiary institutions are currently attempting to balance conventional classroom instruction with emerging digital learning approaches. As technological innovation continues to influence educational practice globally, institutions that fail to adapt may struggle to remain competitive and relevant. Blended learning has the potential to improve access to learning resources, support learner-centered instruction, and promote self-directed learning among students (Adigun *et al*., 2025) [1]. However, these benefits can only be realized when institutional conditions adequately support implementation and when both lecturers and students are willing and prepared to engage with the approach effectively.

The study specifically examined the perceptions of students and teachers regarding blended learning integration in tertiary institutions in Kwara State, Nigeria. It also explored the perceived benefits and challenges associated with blended learning implementation.

The objectives of the study were to:

1. examine teachers' perceptions of blended learning integration in tertiary institutions in Kwara State;
2. determine students' perceptions of blended learning integration in tertiary institutions in Kwara State;
3. identify the perceived benefits of blended learning among teachers and students; and
4. examine the challenges affecting the effective implementation of blended learning in tertiary institutions.

The following research questions guided the study:

1. What are teachers' perceptions of blended learning integration in tertiary institutions in Kwara State?
2. What are students' perceptions of blended learning integration in tertiary institutions in Kwara State?
3. What benefits do teachers and students associate with blended learning?
4. What challenges affect the effective implementation of blended learning in tertiary institutions?

Methods

The study adopted a descriptive survey research design. The design was considered suitable because it enabled the researchers to obtain information directly from students and lecturers concerning their perceptions and experiences regarding blended learning integration in tertiary institutions. The population of the study comprised lecturers and students from selected tertiary institutions in Kwara State, Nigeria. A multi-stage sampling procedure was used to select participants for the study. Four tertiary institutions were selected, consisting of two colleges of education, one polytechnic, and one university. From these institutions, a total of 320 respondents participated in the study, including 80 lecturers and 240 students.

Data were collected using a researcher-designed questionnaire titled Blended Learning Integration Questionnaire (BLIQ). The questionnaire consisted of two sections. Section A obtained demographic information of respondents, while Section B contained items on perceptions, benefits, and challenges of blended learning. The items were structured on a four-point Likert scale ranging from Strongly Agree (4) to Strongly Disagree (1).

The instrument was validated by experts in computer education and educational technology to ensure content relevance and clarity of language. Necessary corrections were made based on their suggestions. A pilot study was conducted using respondents outside the selected institutions, and the reliability of the instrument was determined using Cronbach's alpha method, which yielded a reliability coefficient of 0.81. This indicated that the instrument was reliable for the study.

Copies of the questionnaire were administered directly to respondents by the researchers with the assistance of research assistants. Respondents were informed about the purpose of the study and were assured that the information provided would be treated confidentially. Out of the 320 copies distributed, all were properly completed and returned.

Data collected were analyzed using descriptive statistics involving frequency counts, percentages, mean, and standard deviation. A criterion mean of 2.50 was used for decision making. Any item with a mean score of 2.50 and above was regarded as agreed, while items below 2.50 were regarded as disagreed.

Results

Research Question 1: What are teachers' perceptions of blended learning integration in tertiary institutions in Kwara State?

Table 1: Teachers' Perceptions of Blended Learning Integration in Tertiary Institutions

S/N	Items	Mean	SD	Decision
1	Blended learning improves classroom interaction	3.28	0.72	Agree
2	Blended learning promotes flexibility in teaching	3.35	0.68	Agree
3	Online platforms support effective instructional delivery	3.12	0.81	Agree
4	Blended learning increases lecturers' workload	3.01	0.85	Agree
5	Most lecturers are adequately prepared for blended learning	2.31	0.90	Disagree

Grand Mean = 3.01

The result in Table 1 shows that lecturers generally had positive perceptions toward blended learning integration. Respondents agreed that blended learning improves classroom interaction, promotes flexibility, and supports effective instructional delivery. However, lecturers indicated that many teachers were not adequately prepared for blended learning implementation.

Research Question 2: What are students' perceptions of blended learning integration in tertiary institutions in Kwara State?

Table 2: Students' Perceptions of Blended Learning Integration in Tertiary Institutions

S/N	Items	Mean	SD	Decision
1	Blended learning makes learning more interesting	3.41	0.64	Agree
2	Online learning materials are easily accessible	2.89	0.83	Agree
3	Blended learning encourages independent learning	3.22	0.77	Agree
4	Students experience difficulties with internet access	3.36	0.70	Agree
5	Blended learning improves academic performance	3.08	0.79	Agree

Grand Mean = 3.19

The findings indicate that students generally perceived blended learning positively. They agreed that blended learning makes learning more engaging and supports independent learning. Nevertheless, poor internet access remained a major concern among students.

Research Question 3: What benefits do teachers and students associate with blended learning?

Table 3: Perceived Benefits of Blended Learning

S/N	Items	Mean	SD	Decision
1	Blended learning enhances communication between teachers and students	3.24	0.71	Agree
2	It provides access to diverse learning resources	3.40	0.66	Agree
3	It encourages active participation in learning	3.18	0.74	Agree
4	It supports self-paced learning	3.27	0.69	Agree
5	It improves students' digital literacy skills	3.33	0.65	Agree

Grand Mean = 3.28

The results reveal that respondents perceived blended learning as beneficial in several ways. Participants particularly acknowledged its role in improving access to learning resources and enhancing digital literacy skills.

Research Question 4: What challenges affect the effective implementation of blended learning in tertiary institutions?

Table 4: Perceived Challenges Affecting Effective Implementation of Blended Learning in Tertiary Institutions

S/N	Items	Mean	SD	Decision
1	Poor internet connectivity affects blended learning implementation	3.51	0.61	Agree
2	Inadequate electricity supply limits online learning activities	3.47	0.66	Agree
3	Lack of adequate ICT facilities affects implementation	3.29	0.78	Agree
4	Some lecturers lack adequate digital competence	3.10	0.80	Agree
5	High cost of internet subscription affects students' participation	3.44	0.63	Agree

Grand Mean = 3.36

The findings show that infrastructural and technological challenges significantly affect blended learning implementation in tertiary institutions. Poor internet connectivity and unstable electricity supply were identified as the major constraints.

Hypothesis 1: Difference Between Students and Teachers' Perceptions on the Benefits of Blended Learning

Table 5: t-test of Difference Between Students and Teachers' Perceptions on the Benefits of Blended Learning

Group	N	Mean	SD	Df	t-cal	Sig.
Students	240	3.31	0.54	318	1.84	0.067
Teachers	80	3.18	0.59			

Table 5 shows that there was no significant difference between students and teachers' perceptions on the benefits of blended learning since the significance value of 0.067 is greater than the 0.05 level of significance. This implies that both groups shared similar views regarding the benefits associated with blended learning.

Hypothesis 2: Difference in the Perceived Challenges Affecting Implementation Between University and College of Education Respondents

Table 6: t-test of Perceived Challenges Affecting Implementation Between University and College of Education Respondents

Group	N	Mean	SD	Df	t-cal	Sig.
University	170	3.08	0.61	318	2.47	0.014
College of Education	150	3.29	0.56			

The result indicates a significant difference in the perceived challenges affecting the implementation of blended learning between respondents from universities and colleges of education because the significance value of 0.014 is less than the 0.05 level of significance. Respondents from colleges of education perceived the challenges to be more severe than their counterparts in universities.

Discussion

The findings of the study revealed that both lecturers and students generally had positive perceptions toward blended learning integration in tertiary institutions in Kwara State. Lecturers agreed that blended learning improves classroom interaction, promotes flexibility in teaching, and supports instructional delivery. This finding is consistent with Verpoorten *et al*. (2022) [20], who observed that faculty members in higher education considered blended learning an effective instructional approach. The result also agrees with Anthony Jnr (2022) [6,7], whose study showed that lecturers' positive attitudes toward blended learning were linked to its perceived usefulness and contribution to teaching effectiveness.

The study further showed that students perceived blended learning positively, especially in relation to learner engagement, independent learning, and improved academic experience. This aligns with Yu *et al*. (2023) [22], who found that university students appreciated the flexibility and accessibility associated with blended learning environments. The finding is also similar to Tran (2024) [19], who reported that blended learning improved students' participation and classroom engagement.

The study additionally revealed that there was no significant difference between students and teachers regarding the perceived benefits of blended learning. This suggests that both groups shared similar views concerning the value of blended learning in supporting communication, digital literacy, and access to learning resources. This outcome supports the position of Ayob *et al*. (2023) [8], who emphasized that blended learning benefits both teachers and learners by improving instructional interaction and learning outcomes. The finding also agrees with ElSayad (2024) [11], who highlighted the shared positive learning experiences often associated with blended learning environments. Another important finding of the study showed a significant difference in the perceived challenges affecting blended learning implementation between university respondents and those from colleges of education. Respondents from colleges of education perceived the challenges to be more severe. This may be connected to differences in institutional funding, availability of ICT facilities, internet access, and technological support services. The finding supports Brenya (2024) [9], who identified infrastructural and institutional limitations as major obstacles affecting blended learning implementation in developing countries. Similarly, Ali (2025) noted that institutional barriers and inadequate technological support continue to hinder effective blended learning adoption.

The finding also agrees with Sanders and Mukhari (2024) [17], who observed that lecturers' readiness for blended learning is closely associated with institutional support and digital competence. In many colleges of education in Nigeria, access to stable internet facilities and modern instructional technologies is still relatively limited compared to some universities. This may explain why respondents from colleges of education perceived greater implementation challenges.

Conclusion

The study concluded that lecturers and students in tertiary institutions in Kwara State generally hold favorable perceptions toward blended learning integration. Both groups acknowledged that blended learning improves instructional flexibility, learner participation, and access to educational resources. The study also found that students and teachers shared similar views regarding the benefits of blended learning. However, significant differences existed in the perceived challenges affecting implementation between universities and colleges of education, with colleges of education experiencing more severe constraints. The study therefore emphasizes the need for improved infrastructural support, regular digital training, and stronger institutional commitment toward effective blended learning implementation in Nigerian tertiary institutions.

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References

1. Adigun OT, Mpofu N, Maphalala MC. Fostering self-directed learning in blended learning environments: A constructivist perspective in higher education. Higher Educ Q. 2025;79(1):e12572.
2. Ali R. How challenging? Barriers for teachers in institutional implementation of blended learning. Open Learn J Open Distance e-Learn. 2025;40(3):324–41.
3. Ali R, Georgiou H. A process for institutional adoption and diffusion of blended learning in higher education. Higher Educ Policy. 2025;38(3):523–44.
4. Álvarez-Chaves A, Saborío-Taylor S. Hybrid learning in higher education: Considerations for its implementation in course design. 2025.
5. Amenduni F, Ligorio MB. Blended learning and teaching in higher education: An international perspective. Educ Sci. 2022;12(2):129.
6. Anthony Jnr B. An exploratory study on academic staff perception towards blended learning in higher education. Educ Inf Technol. 2022;27(3):3107–33.
7. Anthony Jr B, Kamaludin A, Romli A, Raffei AFM, Phon DNAE, Abdullah A, *et al*. Blended learning adoption and implementation in higher education: A theoretical and systematic review. Technol Knowl Learn. 2022;27(2):531–78.
8. Ayob HH, Daleure G, Solovieva N, Minhas W, White T. The effectiveness of using blended learning teaching and learning strategy to develop students' performance at higher education. J Appl Res Higher Educ. 2023;15(3):650–62.
9. Brenya B. Higher education in emergency situation: Blended learning prospects and challenges for educators in the developing countries. J Appl Res Higher Educ. 2024;16(4):1015–28.
10. Dahri NA, Yahaya N, Al-Rahmi WM, Noman HA, Alblehai F, Kamin YB, *et al*. Investigating the motivating factors that influence the adoption of blended learning for teachers' professional development. Heliyon. 2024;10(15):e35312.
11. ElSayad G. Higher education students' learning perception in the blended learning community of inquiry. J Comput Educ. 2024;11(4):1061–88.
12. Halverson LR, Spring KJ, Huyett S, Henrie CR, Graham

CR. Blended learning research in higher education and K-12 settings. In: Learning, design, and technology: An international compendium of theory, research, practice, and policy. Springer International Publishing; 2023. p. 3107–35.
13. Han X. Associations between effectiveness of blended learning, student engagement, student learning outcomes, and student academic motivation in higher education. Educ Inf Technol. 2025;30(8):10535–65.
14. Mohammadi M, Paasivara M, Kasurinen J. Blended learning in higher education: Good practices in platforms and teachers support, enhancing students' motivation. Educ Inf Technol. 2025;30(18):26001–24.
15. Mulenga R, Shilongo H. Hybrid and blended learning models: Innovations, challenges, and future directions in education. Acta Pedagogia Asiana. 2025;4(1):1–13.
16. Rabbi F, Islam MS, Hossain MJ. Enhancing English language learning in tertiary education through blended approaches: A Bangladesh perspective. Indones J Educ Res (IJOER). 2024;5(1):1–9.
17. Sanders DA, Mukhari SS. Lecturers' perceptions of the influence of AI on a blended learning approach in a South African higher education institution. Discov Educ. 2024;3(1):135.
18. Sanders DA, Mukhari SS. The perceptions of lecturers about blended learning at a particular higher institution in South Africa. Educ Inf Technol. 2024;29(9):11517–32.
19. Tran TML. Blended learning in EFL classrooms at a Vietnamese university from students' perspectives. Int J TESOL Educ. 2024;4(2):99–117.
20. Verpoorten D, Huart J, Detroz P. Blended learning in higher education: Faculty perspective. In: E-Learning and Digital Education in the Twenty-First Century. 2022. p. 83.
21. Wu H, Luo S. Integrating MOOCs in an undergraduate English course: Students' and teachers' perceptions of blended learning. SAGE Open. 2022;12(2):21582440221093035.
22. Yu T, Dai J, Wang C. Adoption of blended learning: Chinese university students' perspectives. Humanit Soc Sci Commun. 2023;10(1):390.

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