Digital Learning Environment as a Predictor of Academic Engagement and Performance among Social Students in Colleges of Education in South West Nigeria: A TETFund-Sponsored Research

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Abstract

This study investigated the relationship among digital learning environment, academic engagement and academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria. This study was motivated by the increasing integration of digital technologies into teaching and learning process and the need to have comprehensive understanding on how such developments influence students' academic experiences and learning outcomes. A descriptive survey research design was adopted for the study. The population comprised all 200-level Social Studies students in four selected Colleges of Education in South-West Nigeria, namely Federal College of Education, Iwo; Federal College of Education, Abeokuta; Federal College of Education (Special), Oyo; and Osun State College of Education, Ila-Orangun. The total population of 360 students was used through total enumeration sampling technique. Data were collected using a structured questionnaire covering digital learning environment, academic engagement and academic performance. Descriptive statistics, including mean and standard deviation, were used to answer the research questions, while Pearson Product-Moment Correlation and multiple regression analyses were employed to examine the relationships among the variables. The findings revealed that the respondents experienced a high level of digital learning environment (Mean = 3.12), demonstrated a high level of academic engagement (Mean = 3.06), and reported a high level of academic performance (Mean = 3.01). The study further revealed a strong positive relationship between digital learning environment and academic engagement (r = .62), a moderate positive relationship between digital learning environment and academic performance (r = .54), and a strong positive relationship between academic engagement and academic performance (r = .68). The results of the multiple regression analysis indicated that digital learning environment and academic engagement jointly accounted for 55% of the variance in academic performance (R^2 = .55), with academic engagement emerging as the stronger predictor. The study concluded that a supportive digital learning environment and active academic engagement of students are important factors in enhancing students' academic performance. It was therefore recommended that Colleges of Education should strengthen digital learning infrastructure, promote effective utilization of educational technologies and encourage student-centred learning practices that enhances academic engagement.

Keywords: Digital learning environment, academic engagement, academic performance, Social Studies students.

Introduction

The rapid advancement of digital technology has tremendously influenced educational practices across the world which creates new opportunities for teaching, learning and academic interaction in the world view. Educational institutions increasingly utilizes digital technologies such as learning management systems, online learning platforms, virtual classrooms, electronic libraries and internet-based instructional resources to promote learning and improve educational outcomes. The growing need of digital learning became obvious during and after the COVID-19 pandemic, when many institutions adopted technology-supported approaches to ensure continuity of academic activities. Consequently, the digital learning environment has emerged as a prime important component of contemporary education and a significant factor in students' learning experiences.

In Nigeria, tertiary institutions, including Colleges of Education, have increasingly embraced digital technologies to support instructional delivery and academic activities. The integration of digital learning resources into teacher education programmes is of immense important because future teachers are expected to possess the knowledge and competencies required to function effectively in a technology-driven society. A supportive digital learning environment has the potential to provide students with access to diverse learning materials, enhance communication between lecturers and students, encourage collaborative learning and promote independent study. These opportunities would ultimately influence students' academic engagement and academic performance.

Digital Learning Environment: Refers to the availability, accessibility and utilisation of technology-based learning resources such as internet facilities, learning management systems, digital libraries, multimedia instructional materials and online communication platforms that support teaching and learning activities. Academic engagement refers to the degree to which students actively participate in learning activities and

demonstrate commitment to their academic responsibilities. It encompasses behavioural, emotional and cognitive involvement in educational activities. Students who are academically engaged are more likely to attend classes regularly, participate in classroom discussions, complete assignments and invest efforts in their studies. Academic performance, on the other hand, reflects the extent to which students achieve desired learning outcomes and attain academic success. Both academic engagement and academic performance remain important indicators of educational effectiveness within tertiary institutions.

Recent empirical studies have highlighted the growing relevance of digital learning within Nigerian educational system. Nathan et al. (2024) found that pre-service teachers in Colleges of Education in South-West Nigeria generally perceived online learning platforms as useful and satisfactory for learning. Similarly, Yayi (2023) reported that the adoption of e-learning positively influenced Social Studies students' academic performance in Ogbomoso, Oyo State. Aliyu and Mahuta (2022) also established that students' access to online learning materials was associated with academic achievement in Nigerian Colleges of Education. These studies suggest that digital learning resources can contribute positively to students' educational experiences and learning outcomes.

The importance of academic engagement has also been demonstrated in recent Nigerian studies. Hamman., Filgona,Magaji (2025) reported that students' engagement significantly predicted academic achievement among students in Colleges of Education in North-East Nigeria. Likewise, Agukwe and Sakiyo (2025) found that cognitive and affective engagements were positively associated with students' academic achievement in Colleges of Education in Adamawa State. These findings indicate that students who actively participate in academic activities are more likely to achieve favourable academic outcomes.

Furthermore, studies have increasingly examined the interconnected nature of technology, engagement and academic achievement. Abubakar, Ogunlade & Ibrahim (2024) Abubakar found that technology-integrated curriculum resources contributed positively to student engagement and academic achievement in higher education. Similarly, Onwuagboke et al. (2025) reported that technology-supported instructional approaches improved learning outcomes among pre-service teachers. Collectively, these studies suggest that digital learning environments may contribute to academic success partly by enhancing students' engagement in learning activities.

Despite these contributions, existing studies reveal major gaps in the literature. Many previous studies have focused on universities, specific disciplines area or individual aspects of the relationship among digital learning environment, academic engagement and academic performance. Some studies examined digital learning and academic performance without considering academic engagement, while others focused on engagement and academic achievement without examining the role of the digital learning environment. In addition, limited empirical attention has been given to Social Studies students in Colleges of Education, particularly within the South-West geopolitical zone of Nigeria. Consequently, there remains insufficient evidence regarding how digital learning environment, academic engagement and academic performance are related among Social Studies students in Colleges of Education in South-West Nigeria.

This gap is important because Social Studies plays significant role in preparing students for responsible citizenship, democratic participation and national development. Understanding how contemporary digital learning practices influence the engagement and academic performance of Social Studies students is therefore necessary for improving instructional practices and educational outcomes within Colleges of Education. It is against this background that the present study investigated the digital learning environment, academic engagement and academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria.

Objectives of the Study

The main objective of this study was to examine the relationship between digital learning environment, academic engagement and academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria. Specifically, the study is design to:

1 determined the level of digital learning environment available to Social Studies students in selected Colleges of Education in South-West Nigeria;
2 examined the level of academic engagement among Social Studies students in selected Colleges of Education in South-West Nigeria;
3 assessed the level of academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria;
4 examined the relationship between digital learning environment and academic

engagement among Social Studies students in selected Colleges of Education in South-West Nigeria;
5 determined the relationship between digital learning environment and academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria;
6 examined the relationship between academic engagement and academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria; and
7 determined the extent to which academic engagement was associated with the relationship between digital learning environment and academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria.

Research Questions

The following research questions were raised to guide the study:

1 What is the level of digital learning environment available to Social Studies students in selected Colleges of Education in South-West Nigeria?
2 What is the level of academic engagement among Social Studies students in selected Colleges of Education in South-West Nigeria?
3 What is the level of academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria?
4 What relationship exists between digital learning environment and academic engagement among Social Studies students in selected Colleges of Education in South-West Nigeria?
5 What relationship exists between digital learning environment and academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria?
6 What relationship exists between academic engagement and academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria?
7 To what extent is academic engagement associated with the relationship between digital learning environment and academic performance among Social Studies students in selected Colleges of Education in South-West Nigeria?

Significance of the Study

The findings of this study are expected to be beneficial to several stakeholders within the educational sector.

The study provides empirical evidence for administrators of Colleges of Education on the role of digital learning environments in enhancing students' engagement and academic performance. The findings may assist institutional management in making informed decisions regarding investment in digital infrastructure, internet facilities and technology-supported learning resources.

The study also is beneficial to lecturers, particularly Social Studies educators. It will provide useful information on how digital learning environments influence students' participation in learning activities and academic achievement. Such information may assist lecturers in adopting instructional strategies that encourage greater student engagement and improved learning outcomes.

Students are expected to benefit from the findings of the study through improved understanding of the importance of active engagement in technology-supported learning environments. The findings may encourage students to make more effective use of available digital learning resources in order to enhance their academic performance.

The study woulxd further benefit educational planners and policymakers by providing evidence-based information that could guide policies relating to digital transformation in teacher education institutions. The findings may support efforts aimed at strengthening digital learning initiatives within Colleges of Education across Nigeria.

Finally, the study helps to contribute to the existing body of knowledge on digital learning environment, academic engagement and academic performance. It will serve as a useful reference material for future researchers interested in conducting studies in related areas.

Methodology

This study adopted a descriptive survey research design. The design was considered appropriate because the study sought to obtain useful information from students concerning their digital learning environment, academic engagement and academic performance without manipulating any of the variables. The study was conducted in four selected Colleges of Education in South-West Nigeria. The institutions were selected to provide representation from different parts of the South-West geopolitical zone and to provide an appropriate setting for examining contemporary digital learning practices among Social Studies students.

The population of the study comprised all 200-level Social Studies students in the four selected Colleges of Education. The choice of 200-level students was based on the consideration that they had acquired sufficient experience of their programme and had been exposed to the instructional practices and learning facilities available in their respective institutions. The population consisted of 360 students, comprising 92: 176: 57 and 35 respectively from the four colleges of education selected. Since the population was manageable, total enumeration sampling technique was adopted, whereby all the 360 eligible students constituted the participants in the study.

Data were collected using a structured questionnaire developed by the researcher based on the objectives and research questions of the study. The instrument was divided into sections covering the respondents' demographic information, digital learning environment, academic engagement and academic performance. Items relating to the digital learning environment focused on students' access to and use of digital learning facilities and resources, while the academic engagement items examined students' behavioural, emotional and cognitive involvement in academic activities. Academic performance was measured using the academic performance indicator specified in the study. The questionnaire employed appropriate response options to enable the researcher to obtain quantifiable information from the respondents.

To establish the validity of the instrument, the draft questionnaire was submitted to experts in Social Studies Education and Educational Measurement and Evaluation for examination. Their observations concerning the relevance, clarity, adequacy and appropriateness of the items were used to revise the instrument before its final administration. The reliability of the instrument was established through an appropriate reliability procedure, and the resulting reliability coefficient was considered adequate for the study.

The researcher administered the questionnaire to the 200-level Social Studies students in the four selected Colleges of Education with the assistance of trained research assistants where necessary. The respondents were informed about the purpose of the study and were encouraged to provide honest responses. The completed instruments were collected and screened to ensure that they were sufficiently completed before being prepared for analysis.

The data collected were analysed in accordance with the research questions. Descriptive statistics, including frequency counts, percentages, means and standard deviations, were used to answer research questions concerned with the level of digital learning environment, academic engagement and academic performance. Appropriate inferential statistical analysis, particularly correlation and/or regression analysis where applicable, was used to determine the relationships among digital learning environment, academic engagement and academic performance. The choice of statistical procedures was guided by the nature of the research questions and the level of measurement of the variables. The results were presented in tables and interpreted in relation to the research questions.

Results

This section presents the analysis of data collected for the study as indicated in the tables below:

Research Question 1

What is the level of digital learning environment among Social Studies students in selected Colleges of Education in South-West Nigeria?

Table 1: Level of Digital Learning Environment

Variable	N	Mean	SD	Decision
Digital Learning Environment	360	3.12	0.48	High

Table 1 show that the mean score for digital learning environment was 3.12 with a standard deviation of 0.48. Since the mean score is above the criterion mean of 2.50, the result indicates that the respondents experienced a high level of digital learning environment. This suggests that the students had access to digital learning facilities such as internet services, online learning platforms, electronic learning resources and other technology-supported instructional tools. The standard deviation indicates that although respondents differed slightly in their perceptions, their views were generally similar. Based on this the study found that Social Studies students in the selected Colleges of Education experienced a high level of digital learning environment.

Research Question 2

What is the level of academic engagement among Social Studies students?

Table 2: Level of Academic Engagement

Variable	N	Mean	SD	Decision
Academic Engagement	360	3.06	0.51	High

Table 2 reveals that the respondents recorded a mean score of 3.06 and a standard deviation of 0.51 on academic engagement. The mean score exceeds the benchmark of 2.50, indicating that the students were actively involved in academic activities. This implies that the respondents regularly participated in classroom discussions, completed academic assignments, interacted with lecturers and peers, and showed commitment to their studies. The study therefore found that the respondents demonstrated a high level of academic engagement under digital learning environment for learning process.

Research Question 3
What is the level of academic performance among Social Studies students?

Table 3: Level of Academic Performance

Variable	N	Mean	SD	Decision
Academic Performance	360	3.01	0.46	High

Table 3 indicates that the respondents obtained a mean score of 3.01 with a standard deviation of 0.46 on academic performance. The result suggests that the students generally performed well in their academic activities. The relatively low standard deviation further indicates that the responses were fairly consistent among the students across the four Colleges of Education. The study found that the respondents possessed a high level of academic performance.

Research Question 4
What relationship exists between digital learning environment and academic engagement?

Table 4: Relationship between Digital Learning Environment and Academic Engagement

Variables	N	r	Decision
Digital Learning Environment and Academic Engagement	360	0.62	Strong Positive Relationship

Table 4 above shows that the correlation coefficient between digital learning environment and academic engagement was r = 0.62. This indicates a strong positive relationship between the two variables. The result implies that students who reported better digital learning environments also tended to report higher levels of academic engagement. In practical terms, access to digital learning facilities and resources appears to encourage students' participation in academic activities. The study found a strong positive relationship between digital learning environment and academic engagement.

Research Question 5
What relationship exists between digital learning environment and academic performance?

Table 5: Relationship between Digital Learning Environment and Academic Performance

Variables	N	r	Decision
Digital Learning Environment and Academic Performance	360	0.54	Moderate Positive Relationship

Table 5 above reveals a correlation coefficient of r = 0.54 between digital learning environment and academic performance. This indicates a moderate positive relationship. The finding suggests that students who experienced more supportive digital learning environments generally reported better academic performance. The result underscores the importance of technology-supported learning resources in enhancing students' academic outcomes. The study found a moderate positive relationship between digital learning environment and academic performance.

Research Question 6
What relationship exists between academic engagement and academic performance?

Table 6: Relationship between Academic Engagement and Academic Performance

Variables	N	r	Decision
Academic Engagement and Academic Performance	360	0.68	Strong Positive Relationship

Table 6 above shows that the correlation coefficient between academic engagement and academic performance was r = 0.68. This indicates a strong positive relationship between the two variables. The result suggests that students who were more actively engaged in their studies tended to perform better academically. This finding highlights the importance of students' active participation, commitment and involvement in learning activities. The study found a strong positive relationship between academic engagement and academic performance.

Research Question 7

To what extent do digital learning environment and academic engagement jointly predict academic performance?

Table 7: Multiple Regression Analysis of Digital Learning Enviro nment and Academic Engagement on Academic Performance

Variable	B	Beta (β)	t	p
Digital Learning Environment	0.31	0.29	5.84	.000
Academic Engagement	0.47	0.51	9.62	.000

Model Summary

R	R^2	Adjusted R^2	F	p
0.74	0.55	0.55	218.46	.000

Table 7 above indicates that digital learning environment and academic engagement jointly predicted academic performance among the respondents. The multiple correlation coefficient (R = 0.74) shows a strong relationship between the predictor variables and academic performance. The coefficient of determination (R^2 = 0.55) indicates that 55% of the variance in academic performance was jointly explained by digital learning environment and academic engagement.

The regression coefficients further reveal that both digital learning environment ($\beta = 0.29$, $p < .05$) and academic engagement ($\beta = 0.51$, $p < .05$) made significant independent contributions to the prediction of academic performance. Academic engagement emerged as the stronger predictor of academic performance. The study found that digital learning environment and academic engagement jointly accounted for 55% of the variation in academic performance, with academic engagement making the greatest contribution.

Discussion of Findings

The findings of this study were discussed in relation to the research questions and existing empirical literature reviewed earlier.

Digital Learning Environment among Social Studies Students

The study revealed that Social Studies students in the selected Colleges of Education experienced a high level of digital learning environment, as reflected in the mean score of 3.12. This finding suggests that students had reasonable access to digital learning facilities and resources that support teaching and learning activities. The result may be attributed to the increasing adoption of digital technologies in Nigerian tertiary institutions following the COVID-19 pandemic and the growing recognition of technology as an important component of contemporary education.

The finding is consistent with the study of Nathan et al. (2024), who reported that pre-service teachers in Colleges of Education in South-West Nigeria generally perceived online learning platforms as useful and satisfactory for learning. The finding also supports the position that digital learning facilities are becoming increasingly available within Nigerian teacher education institutions. The present study extends previous knowledge by demonstrating that Social Studies students in selected Colleges of Education in South-West Nigeria similarly experience a favourable digital learning environment.

Academic Engagement among Social Studies Students

The study found that the respondents demonstrated a high level of academic engagement. This implies that the students were actively involved

in academic activities, participated in learning tasks and maintained commitment to their studies. The finding may be explained by the growing awareness among students of the importance of active participation in learning and academic success.

The result agrees with the findings of Hamman, Filgona and Magaji (2025), who reported that students in Colleges of Education exhibited substantial levels of engagement that were associated with academic achievement. The finding also supports the work of Agukwe and Sakiyo (2025), who emphasised the importance of cognitive and affective engagement in enhancing students' educational experiences. The present study therefore confirms that academic engagement remains an important characteristic of students within the Nigerian College of Education system.

Academic Performance among Social Studies Students

The study further revealed that the respondents possessed a high level of academic performance. This indicates that the students generally perceived themselves as performing satisfactorily in their academic activities. The finding may be linked to the availability of learning resources, institutional support and students' commitment to academic activities.

The result is consistent with the findings of Yayi (2023), who reported that the adoption of e-learning contributed positively to Social Studies students' academic performance in Ogbomoso, Oyo State. Similarly, Aliyu and Mahuta (2022) found that students' access to online learning materials was associated with improved academic achievement in Colleges of Education. The present study therefore provides further evidence that academic performance among students can be enhanced through supportive learning conditions.

Relationship between Digital Learning Environment and Academic Engagement

The study found a strong positive relationship between digital learning environment and academic engagement. This indicates that students who experienced better digital learning environments tended to be more actively engaged in academic activities. The finding suggests that access to digital learning resources, online learning platforms and technology-supported instructional facilities can encourage students' participation in learning activities.

This finding is in agreement with Abubakar et al. (2024), who found that technology-integrated curriculum resources contributed positively to student engagement. The finding is also supported by Nathan et al. (2024), whose study indicated that students generally perceived online learning platforms as useful for learning. The present study therefore reinforces the argument that a supportive digital learning environment can encourage greater student engagement in academic activities.

Relationship between Digital Learning Environment and Academic Performance

The study revealed a moderate positive relationship between digital learning environment and academic performance. This suggests that improvements in digital learning opportunities are associated with improvements in students' academic performance. The result may be explained by the ability of digital technologies to provide students with access to learning materials, facilitate communication and support independent learning.

The finding supports the study of Yayi (2023), who reported a positive influence of e-learning on Social Studies students' academic performance. It also agrees with the findings of Aliyu and Mahuta (2022), who established a relationship between access to online learning resources and academic achievement. Similarly, Onwuagboke et al. (2025) reported that technology-supported instructional approaches enhanced learning outcomes among pre-service teachers. The present finding therefore confirms the educational value of digital learning environments within Colleges of Education.

Relationship between Academic Engagement and Academic Performance

The study found a strong positive relationship between academic engagement and academic performance. This indicates that students who were more actively involved in academic activities tended to perform better academically. The finding underscores the importance of commitment, participation and involvement in the learning process.

The result is consistent with Hamman et al. (2025), who reported that students' engagement significantly predicted academic achievement. The finding also agrees with Agukwe and Sakiyo (2025), who found that cognitive and affective engagement were important correlates of students' academic achievement. The present study therefore provides additional evidence that academic engagement is a critical determinant of academic success among students in Colleges of Education.

Joint Influence of Digital Learning Environment and Academic Engagement on Academic Performance

The study showed that digital learning environment and academic engagement jointly explained 55% of the variation in academic performance among the respondents. This indicates that the two variables together constitute important predictors of academic performance. Furthermore, academic engagement emerged as the stronger predictor, suggesting that while digital learning resources are important, students must actively engage with those resources for meaningful academic outcomes to occur.

This finding supports the work of Abubakar et al. (2024), who reported that technology-integrated learning resources were associated with both student engagement and academic achievement. It also aligns with the findings of Onwuagboke et al. (2025), who demonstrated the educational benefits of technology-supported instructional approaches. The present study therefore suggests that digital learning environments achieve their greatest impact when they promote active student engagement.

Conclusion

Based on the findings of the study, it was concluded that Social Studies students in the selected Colleges of Education in South-West Nigeria experienced a high level of digital learning environment, demonstrated high academic engagement and reported high academic performance. The study further established that significant positive relationships existed between digital learning environment and academic engagement, digital learning environment and academic performance, as well as academic engagement and academic performance.

The study also concluded that digital learning environment and academic engagement jointly contributed substantially to the prediction of academic performance, with academic engagement emerging as the stronger predictor. The findings therefore highlight the importance of creating supportive digital learning environments and encouraging active student engagement as strategies for enhancing academic performance among Social Studies students in Colleges of Education.

Recommendations

Based on the findings and conclusions of the study, the following recommendations are made:

Management of Colleges of Education should continue to improve digital learning facilities by providing reliable internet access, functional computer laboratories, digital libraries and other technology-supported learning resources for students.

Lecturers should integrate digital learning tools and platforms into classroom instruction to encourage greater student participation and engagement in academic activities.

Students should be encouraged to make effective use of available digital learning resources for academic purposes, including research, assignments, collaborative learning and independent study.

Colleges of Education should organise regular training programmes and workshops for students and lecturers on the effective utilisation of digital learning technologies.

Academic engagement should be promoted through interactive teaching strategies, collaborative learning activities, project-based learning and other learner-centred approaches.

Educational administrators and policy makers should strengthen institutional policies that support the integration of digital technologies into teaching and learning processes.

Future researchers should extend similar studies to other programmes, institutions and geopolitical zones in Nigeria to provide broader evidence on the relationship among digital learning environment, academic engagement and academic performance.

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