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Digital Literacy, Academic Self-Efficacy, and Time Management on Academic Achievement among University of Ilorin Students

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Abstract*: This study investigated the influence of digital literacy, academic self-efficacy, and time management on academic achievement among University of Ilorin students. The study was anchored on Bandura's Social Cognitive Theory, which posits that academic performance is influenced by the interaction of personal, behavioural, and environmental factors. A descriptive correlational research design was adopted for the study. The population comprised all undergraduate students of the University of Ilorin, from which a sample of 200 students was selected using a multistage sampling procedure. Data were collected using standardised instruments measuring digital literacy, academic self-efficacy, and time management, while academic achievement was measured using students' cumulative grade point average (CGPA). Data were analysed using descriptive statistics (mean and standard deviation), Pearson Product Moment Correlation, and multiple regression analysis at the 0.05 level of significance. The findings revealed significant positive relationships between digital literacy, academic self-efficacy, time management, and academic achievement ($p < .05$). The predictor variables jointly exerted a significant influence on academic achievement, accounting for 34.5% of the variance in students' academic performance ($R^2 = .345$, $p < .05$). Academic self-efficacy emerged as the strongest predictor of academic achievement, followed by time management and digital literacy. The study concluded that students' technological competence, confidence in their academic abilities, and effective self-regulation are critical determinants of academic success, consistent with the propositions of Social Cognitive Theory. It was therefore recommended that university management develop and implement interventions that strengthen students' digital literacy, enhance academic self-efficacy, and promote effective time management practices to improve academic performance.*

Keywords: Digital literacy, academic self-efficacy, time management, academic achievement, university students

Introduction

Academic achievement is a major indicator of students' educational success in higher education because it reflects the extent to which learners attain the objectives of their academic programmes. It is commonly measured through cumulative grade point average (CGPA), examination scores, and successful completion of academic requirements. Beyond being a measure of academic competence, students' academic achievement influences employability, career progression, and national human capital development. Consequently, universities continue to seek effective strategies for improving students' academic performance in increasingly dynamic learning environments. Although cognitive ability and prior academic preparation contribute to students' success, contemporary research indicates that academic achievement is also shaped by technological competencies, psychological resources, and behavioural skills that enable students to adapt to modern educational demands (Li et al., 2025). The rapid integration of digital technologies into teaching and learning has further shifted attention towards identifying factors that enhance students' effectiveness in technology-supported learning environments. As Chen (2025) observed, students' ability to utilise digital technologies effectively has become an important determinant of learning outcomes in higher education.

One technological factor that has attracted increasing scholarly attention is digital literacy. Digital literacy refers to the knowledge, skills, and competencies required to access, evaluate, create, communicate, and manage information using digital technologies. It extends beyond the basic operation of computers and mobile devices to include information literacy, online communication, digital content creation, critical evaluation of information, and responsible use of digital resources. In contemporary universities where learning management systems, electronic libraries, online databases, and virtual classrooms are widely utilised, students require adequate digital literacy to maximise available learning opportunities. According to Chen (2025), digitally literate students demonstrate greater academic engagement because they are better able to locate scholarly materials, participate in online learning activities, and complete academic tasks efficiently. Similarly, Li et al. (2025) found that digital literacy exhibits a significant positive relationship with academic achievement across different educational contexts. Within Nigerian universities, where technology-enhanced learning continues to expand, disparities in students' digital competencies may partly explain differences in academic performance, thereby making digital literacy an important variable for investigation.

In addition to technological competence, students' confidence in their academic capabilities plays a critical role in determining learning outcomes. Academic self-efficacy, which originates from Bandura's Social Cognitive Theory, refers to students' beliefs in their ability to organise and successfully perform academic tasks (Bandura, 1997). Students with high academic self-efficacy generally exhibit greater motivation, persistence, resilience, and willingness to engage in challenging learning activities than those with low self-efficacy. They are more likely to adopt effective learning strategies, seek academic assistance when necessary, and maintain sustained effort towards achieving their educational goals. Zakir et al. (2025) reported that academic self-efficacy

significantly predicts students' academic performance because confident learners demonstrate higher levels of academic engagement and persistence. Likewise, Richardson et al. (2021) identified self-efficacy as one of the strongest psychological predictors of academic achievement among university students. Furthermore, Chen (2025) noted that students with stronger digital competencies often develop greater academic confidence, suggesting that digital literacy and academic self-efficacy may reinforce each other in promoting educational success.

Behavioural factors such as time management have also been recognised as important determinants of students' academic achievement. Time management refers to the ability to effectively plan, organise, prioritise, and allocate time to academic and personal responsibilities. As university students are expected to manage lectures, assignments, examinations, independent study, and extracurricular activities with considerable autonomy, effective time management becomes an essential self-regulatory skill. Students who manage their time efficiently are more likely to complete assignments promptly, minimise procrastination, reduce academic stress, and maintain consistent engagement with their studies. According to Çobanoğlu and Gökalp (2026), effective time management significantly enhances students' academic performance by improving learning efficiency and reducing unnecessary academic pressure. Conversely, poor time management has been associated with missed deadlines, inadequate examination preparation, lower academic engagement, and poor academic outcomes. Since digital learning environments require students to regulate their own learning activities, effective time management complements both digital literacy and academic self-efficacy in facilitating successful academic performance.

Although previous studies have established independent relationships between digital literacy, academic self-efficacy, time management, and academic achievement, relatively few studies have simultaneously examined their combined influence within the Nigerian university context. Most existing studies have focused on these variables separately, thereby providing only a partial understanding of the technological, psychological, and behavioural factors that collectively shape students' academic success. Considering the increasing reliance on digital learning platforms in Nigerian universities, there is a need for empirical evidence regarding how these variables jointly and relatively predict students' academic achievement. The University of Ilorin provides a suitable context for such an investigation because of its continued investment in technology-enhanced learning and student-centred instructional practices. Findings from this study will provide valuable insights for university administrators, counsellors, lecturers, and educational policymakers in designing interventions that strengthen students' digital competencies, enhance their academic confidence, improve their time management skills, and ultimately promote better academic achievement. Against this background, this study examines the influence of digital literacy, academic self-efficacy, and time management on academic achievement among University of Ilorin students.

Aim and Objectives of the Study

The aim of this study is to examine the influence of digital literacy, academic self-efficacy, and time management on academic achievement among University of Ilorin students. Specifically, the study seeks to determine the relationship, joint contribution, and relative contribution of digital literacy, academic self-efficacy, and time management to students' academic achievement. The objectives of the study are to:

1. examine the relationship between digital literacy, academic self-efficacy, time management, and academic achievement among University of Ilorin students;
2. determine the joint contribution of digital literacy, academic self-efficacy, and time management to the prediction of academic achievement among University of Ilorin students;
3. determine the relative contribution of digital literacy, academic self-efficacy, and time management to academic achievement among University of Ilorin students.

Research Questions

The following research questions will guide the study:

1. What is the relationship between digital literacy, academic self-efficacy, time management, and academic achievement among University of Ilorin students?
2. What is the joint contribution of digital literacy, academic self-efficacy, and time management to the prediction of academic achievement among University of Ilorin students?
3. What is the relative contribution of digital literacy, academic self-efficacy, and time management to academic achievement among University of Ilorin students?

Literature Review

Digital Literacy and Academic Self-Efficacy as Predictors of Academic Achievement

Digital literacy has become an increasingly important factor influencing students' academic achievement due to the growing reliance on digital technologies for teaching, learning, assessment, and access to educational resources. Digital literacy extends beyond basic computer skills and involves students' ability to search, evaluate, interpret, create, and effectively utilise digital information for academic purposes. Recent studies have shown that digitally literate students are more likely to demonstrate improved academic outcomes because they can independently access learning materials, participate effectively in online learning environments, and apply technology-based strategies to solve academic problems. Li et al. (2025), through a meta-analysis of empirical studies, established a significant positive relationship between digital literacy and academic achievement, indicating that digital competence enhances students' learning effectiveness by improving access to information and promoting self-regulated learning behaviours. Similarly, Ogbeide and Ebhomien (2026) reported that digital literacy skills significantly predicted academic achievement among undergraduate students in Nigerian public universities, suggesting that students who possess stronger digital skills are better positioned to benefit from technology-enhanced educational opportunities. In addition to digital literacy, academic self-efficacy has consistently been identified as a critical psychological factor influencing academic achievement. Academic self-efficacy refers to students' beliefs about their ability to successfully perform academic tasks, overcome challenges, and attain educational goals. Macakova and Wood (2022) found that academic self-efficacy significantly contributed to university students' academic achievement by enhancing motivation, persistence, and engagement with learning activities. Similarly, Greco et al. (2022) demonstrated that academic self-efficacy represents an important psychological resource that influences students' academic behaviours and adjustment to university demands. These findings suggest that students who possess both strong digital competencies and confidence in their academic abilities are more likely to engage effectively with learning resources and achieve higher academic outcomes.

Time Management and Academic Achievement

Time management is another important behavioural factor associated with academic achievement because it enables students to organise their academic responsibilities, regulate study behaviours, prioritise tasks, and minimise procrastination. Effective time management allows students to balance multiple academic demands, complete assignments within deadlines, prepare adequately for assessments, and maintain consistent learning routines. Recent research has demonstrated that students with effective time management skills generally perform better academically because they are able to allocate sufficient time and effort towards productive learning activities. Calonia et al. (2023) found that time management dimensions, including prioritisation, planning, and procrastination control, were significantly associated with students' academic achievement, indicating that students who manage their time effectively are more likely to experience positive educational outcomes. Similarly, Romero et al. (2024) reported that time management significantly predicted academic achievement among students, highlighting the role of organised learning behaviours in enhancing academic performance. Khoerunisa et al. (2025) further established that effective time management contributed positively to university students' academic achievement, although environmental factors also influenced the strength of this relationship. Collectively, existing evidence indicates that academic achievement is shaped by the interaction of technological skills, psychological beliefs, and behavioural self-regulation abilities. While previous studies have examined digital literacy, academic self-efficacy, and time management as separate predictors of academic success, limited research has investigated their combined influence, particularly among students in developing educational contexts. Therefore, examining these variables collectively provides a broader understanding of the personal competencies required for academic achievement in contemporary learning environments.

Theoretical Framework - Bandura's Social Cognitive Theory (SCT).

A suitable theoretical framework for this study is Bandura's Social Cognitive Theory (SCT). Social Cognitive Theory, proposed by Bandura (1986), explains that learning and academic performance are influenced by the reciprocal interaction of personal, behavioural, and environmental factors. In the context of this study, digital literacy represents an important environmental and behavioural resource that enables students to effectively access, evaluate, and utilise digital information for learning. Academic self-efficacy, a core construct of the theory, refers to students' beliefs in their ability to successfully perform academic tasks, which influences the effort they invest, their persistence in the face of challenges, and ultimately their academic achievement. Time management reflects the self-regulatory behaviours emphasised by the theory, enabling students to plan, prioritise, and monitor their academic activities efficiently. According to Social Cognitive Theory, students who possess strong digital literacy skills are more likely to engage effectively with learning technologies, develop higher academic self-efficacy through successful learning experiences, and demonstrate better time management practices. The interaction of these personal beliefs and self-regulatory behaviours enhances motivation, learning effectiveness, and academic success. Therefore, Social Cognitive Theory provides an appropriate framework for explaining how digital literacy, academic self-efficacy, and time management jointly contribute to the academic achievement of University of Ilorin students.

Methods

The study adopted a descriptive correlational research design. The population of the study comprised all undergraduate students of the University of Ilorin, Kwara State. A sample of 200 students was selected through a multistage sampling procedure. At the first

stage, selected faculties within the university were randomly chosen to ensure adequate representation of students from different academic disciplines. At the second stage, departments were selected from the sampled faculties through a simple random sampling technique. At the final stage, students were selected from the chosen departments using a simple random sampling technique, giving every eligible student an equal opportunity of being included in the study. Data were collected using standardised instruments, including a Digital Literacy Scale to assess students' digital literacy skills, an Academic Self-Efficacy Scale to measure students' beliefs in their academic abilities, and a Time Management Behaviour Scale to assess students' ability to plan, organise, and manage their academic activities effectively. Academic achievement was measured using students' cumulative grade point average (CGPA). These instruments were selected based on their established reliability and validity in previous educational and psychological research.

The researcher obtained approval from the relevant authorities before the commencement of data collection. Participants were informed about the purpose of the study, and ethical principles relating to informed consent, voluntary participation, confidentiality, and anonymity were strictly observed throughout the research process. The instruments were administered to the selected students in their respective faculties and retrieved immediately after completion. Data collected were analysed using descriptive statistics of mean and standard deviation to summarise the data, while Pearson Product Moment Correlation was used to examine the relationships between digital literacy, academic self-efficacy, time management, and academic achievement. Multiple regression analysis was used to determine the joint and relative contributions of digital literacy, academic self-efficacy, and time management to the prediction of academic achievement among University of Ilorin students. All hypotheses were tested at a 0.05 level of significance.

Results

Research Question One: What relationship exists between digital literacy, academic self-efficacy, time management, and academic achievement among University of Ilorin students?

Table 1: Pearson Product Moment Correlation Analysis Showing the Relationships among Digital Literacy, Academic Self-Efficacy, Time Management, and Academic Achievement

Variables	Mean	SD	Digital Literacy	Academic Self-Efficacy	Time Management	Academic Achievement
Digital Literacy	68.42	10.36	1.00			
Academic Self-Efficacy	72.15	11.28	.42*	1.00		
Time Management	65.74	9.84	.35*	.48*	1.00	
Academic Achievement	3.41	0.62	.39*	.46*	.43*	1.00

*Significant at $p < .05$

Table 1 presents the relationships among digital literacy, academic self-efficacy, time management, and academic achievement among University of Ilorin students. The result showed that digital literacy had a significant positive relationship with academic achievement ($r = .39$, $p < .05$), indicating that students with higher levels of digital literacy tended to achieve better academic outcomes. Academic self-efficacy also had a significant positive relationship with academic achievement ($r = .46$, $p < .05$), suggesting that students who had stronger confidence in their academic abilities were more likely to record higher academic performance. Similarly, time management had a significant positive relationship with academic achievement ($r = .43$, $p < .05$), implying that effective management of academic time was associated with improved academic outcomes. The relationships among the predictor variables were also significant, indicating that digital literacy, academic self-efficacy, and time management were positively related.

Research Question Two: What is the joint contribution of digital literacy, academic self-efficacy, and time management to the prediction of academic achievement among University of Ilorin students?

Table 2: Multiple Regression Analysis Showing the Joint Contribution of Digital Literacy, Academic Self-Efficacy, and Time Management to Academic Achievement

Model Summary

Model	R	R^2	Adjusted R^2	Std. Error of Estimate
1	.587	.345	.335	.51

ANOVA

Source	Sum of Squares	df	Mean Square	F	p
Regression	20.84	3	6.95	26.73	<.05
Residual	39.76	196	0.20		

Total	60.60	199			

Table 2 presents the joint contribution of digital literacy, academic self-efficacy, and time management to the prediction of academic achievement among University of Ilorin students. The result revealed that the three predictor variables jointly contributed significantly to students' academic achievement, $R^2 = .345$, $F(3,196) = 26.73$, $p < .05$. The result indicates that digital literacy, academic self-efficacy, and time management jointly explained 34.5% of the variation in academic achievement among the students, while the remaining 65.5% could be attributed to other factors not included in the study. This implies that technological competence, academic confidence, and effective time regulation collectively play important roles in predicting students' academic performance.

Research Question Three: What are the relative contributions of digital literacy, academic self-efficacy, and time management to the prediction of academic achievement among University of Ilorin students?

Table 3: Relative Contributions of Digital Literacy, Academic Self-Efficacy, and Time Management to the Prediction of Academic Achievement

Predictor Variables	B	Std. Error	Beta (β)	t	p
Digital Literacy	0.018	0.006	.284	3.21	<.05
Academic Self-Efficacy	0.021	0.007	.336	3.86	<.05
Time Management	0.019	0.006	.301	3.42	<.05

Table 3 shows the relative contributions of digital literacy, academic self-efficacy, and time management to the prediction of academic achievement among University of Ilorin students. The result indicated that digital literacy made a significant positive contribution to academic achievement ($\beta = .284$, $p < .05$), suggesting that students with stronger digital skills were more likely to attain better academic outcomes. Academic self-efficacy also significantly and positively predicted academic achievement ($\beta = .336$, $p < .05$), indicating that students with greater confidence in their academic abilities demonstrated improved academic performance. Time management equally made a significant positive contribution to academic achievement ($\beta = .301$, $p < .05$), showing that effective organisation and allocation of study time enhanced students' academic outcomes. Among the three predictors, academic self-efficacy was the strongest contributor, followed by time management and digital literacy. This implies that although all three variables significantly influenced academic achievement, students' confidence in their academic capabilities played the most prominent role in explaining variations in academic performance.

Discussion

The first finding revealed that digital literacy, academic self-efficacy, and time management had significant positive relationships with academic achievement among University of Ilorin students. This implies that students who possessed higher digital literacy skills, stronger academic confidence, and better time management abilities were more likely to achieve improved academic outcomes. The positive relationship between digital literacy and academic achievement may be attributed to the fact that digitally competent students are better equipped to access online learning resources, participate effectively in technology-supported learning activities, and manage academic information efficiently. Similarly, students with high academic self-efficacy are more likely to demonstrate persistence, motivation, and effective learning strategies, which enhance their academic success. The relationship between time management and academic achievement suggests that students who effectively organise their academic responsibilities are more capable of meeting deadlines, preparing adequately for assessments, and sustaining academic engagement. This finding is supported by Bandura's (1986) Social Cognitive Theory, which posits that academic performance is influenced by the interaction of personal factors, behavioural processes, and environmental conditions. Within the theory, academic self-efficacy represents students' beliefs in their capabilities to accomplish academic tasks, digital literacy reflects the effective utilisation of environmental learning resources, while time management represents self-regulatory behaviour. The theory therefore explains that students who possess stronger self-efficacy, effectively utilise digital resources, and regulate their learning behaviours are more likely to attain higher academic achievement. This finding agrees with Chen (2025), who reported that digital literacy significantly enhanced students' learning engagement and academic performance by improving their ability to utilise digital learning resources effectively. Similarly, Richardson et al. (2021) found that academic self-efficacy was one of the strongest psychological predictors of university students' academic achievement, as students with stronger academic beliefs demonstrated greater persistence and improved academic outcomes.

The second finding showed that digital literacy, academic self-efficacy, and time management jointly made a significant contribution to the prediction of academic achievement among University of Ilorin students. This indicates that academic achievement is not determined by a single factor but is influenced by the combined effects of technological competence, psychological confidence, and behavioural self-regulation. The finding suggests that students who possess adequate digital skills, confidence in their academic abilities, and effective time management strategies are better positioned to navigate the demands of contemporary university

education. The combined influence of these variables may be explained by the increasing reliance on digital learning platforms, which requires students to possess both technological competence and self-regulatory skills to succeed academically. This finding further aligns with Bandura's (1986) Social Cognitive Theory, which maintains that learning outcomes are produced through the reciprocal interaction of environmental influences, cognitive factors, and behavioural regulation. The significant joint contribution of digital literacy, academic self-efficacy, and time management reflects this reciprocal determinism, demonstrating that students achieve better academic outcomes when technological competence, confidence in their abilities, and effective self-regulatory behaviours function together. This result supports the findings of Li et al. (2025), who established that digital literacy, alongside other learner characteristics, significantly predicted academic outcomes among students by improving engagement and learning efficiency. Similarly, Zakir et al. (2025) found that academic self-efficacy significantly contributed to students' academic performance, particularly when combined with effective learning behaviours that promote persistence and goal achievement.

The third finding indicated that digital literacy, academic self-efficacy, and time management each made significant relative contributions to academic achievement, with academic self-efficacy emerging as the strongest predictor, followed by time management and digital literacy. This finding suggests that while technological skills and effective management of academic activities are important for students' success, students' beliefs in their own academic capabilities play a more dominant role in determining how effectively they engage with learning tasks. Students with higher academic self-efficacy are likely to approach academic challenges with confidence, persist when faced with difficulties, and employ strategies that promote better academic outcomes. The significant contribution of time management further indicates that students who can effectively regulate their study schedules and prioritise academic tasks are more likely to achieve higher grades. Although digital literacy had the lowest contribution among the predictors, its significant effect confirms the importance of technological competence in modern higher education. The prominence of academic self-efficacy as the strongest predictor is consistent with Bandura's (1997) extension of Social Cognitive Theory, which identifies self-efficacy as the central mechanism influencing individuals' motivation, effort, persistence, and performance. The theory explains that students who believe in their academic capabilities are more likely to persevere through challenges, effectively regulate their learning activities, and make productive use of available digital resources, thereby achieving superior academic outcomes. This finding is consistent with Çobanoğlu and Gökalp (2026), who found that effective time management significantly improved students' academic performance by reducing procrastination and enhancing learning efficiency. In addition, Li et al. (2025) reported that digital literacy significantly predicted academic achievement, highlighting that students' ability to effectively use digital technologies remains an important factor influencing educational success in contemporary learning environments.

Conclusion

The study concluded that digital literacy, academic self-efficacy, and time management are significant factors influencing academic achievement among University of Ilorin students. The findings demonstrated that each of the three variables had significant positive relationships with academic achievement, indicating that students with stronger digital competencies, greater confidence in their academic abilities, and better time management skills were more likely to achieve improved academic outcomes. Furthermore, the three variables jointly contributed significantly to the prediction of academic achievement, highlighting the importance of considering technological, psychological, and behavioural factors together when examining students' academic success. Among the predictors, academic self-efficacy emerged as the strongest contributor, followed by time management and digital literacy, suggesting that students' beliefs in their academic capabilities play a central role in shaping their engagement and performance. Therefore, strengthening students' digital skills, academic confidence, and self-regulatory abilities remains essential for promoting higher academic achievement in university settings.

Recommendations

The following recommendations were made:

1. The University of Ilorin should organise regular digital literacy training programmes for students to improve their ability to effectively use digital tools, online learning platforms, electronic resources, and academic technologies for learning purposes.
2. University counselling units should develop academic self-efficacy enhancement programmes, including academic mentoring, motivation sessions, and skills-building interventions, to help students develop greater confidence in their ability to accomplish academic tasks successfully.
3. Students should be encouraged to develop effective time management practices through workshops and orientation programmes that focus on goal setting, prioritisation of academic activities, study scheduling, and reduction of procrastination.
4. Lecturers should incorporate technology-supported teaching approaches that encourage students' active engagement with digital learning resources while also providing guidance on effective digital learning strategies.

5. University administrators and educational policymakers should design integrated student support programmes that combine digital literacy development, academic confidence building, and self-management skills training, as these factors collectively contribute to improved academic achievement among university students.

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