

Influence of Information and Communication Technology (ICT) Skills on the Academic Performance of Educational Technology Undergraduates in Southwestern Nigeria

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DOI: <https://doi.org/10.5281/zenodo.21718321>

ABSTRACT

The study examined the influence of information and communication technology (ICT) skills on the academic performance of educational technology undergraduates in Southwestern, Nigeria. Four (4) research questions guided the study. A descriptive survey research design was used. The population of this study comprised 2,421 Educational Technology undergraduates of Tai Solarin Federal University of Education, (TASFUED) Ijagun, Ogun State, and Adekunle Ajasin University (AAUA). For record purpose, TASFUED has a total of 1246 and AAUA has 1175 undergraduates. A total of 520 Educational Technology undergraduates of Tai Solarin Federal University of Education, (TASFUED), and Adekunle Ajasin University (AAUA) were selected as sample size using stratified sampling technique. However, 300 and 220 were selected from TASFUED and AAUA respectively. A self-researchers-designed instrument tagged Information and Communication Technology Skills and Academic Performance Questionnaire (ICTSAPQ) with 0.79 as reliability coefficient was used for data collection. Descriptive statistics of mean and standard deviation were used for answering research questions 1, 3 and 4. Research question 2 was analyses using inferential statistics of regression analysis. The findings of the study showed that basic computer proficiency skill, keyboarding and word processing skill, data management and spreadsheets skill, presentation software skill and information literacy and critical evaluation skill were among required information and communication technology (ICT) skills for the academic performance of educational technology undergraduates. ICT skills influence academic performance of educational technology students $\beta = .100$, $t = 2.227$, $P < .05$. It was also showed that poor infrastructure and access limitations are issues, skills and knowledge are gaps, poor or unstable internet connectivity is a problem, inconsistent power supply is a problem and high cost of personal ICT devices (laptops, smartphones) and internet access creates a "digital divide are problems were among issues affecting undergraduates' usage of ICT skills for academic

performance of educational technology undergraduates. And that institutional support is a strategy, integrate ICT into the curriculum is a strategy, usage of student-centered learning approaches, adequate infrastructure and access and align university curricula with current industry needs were among the strategies to be adopted towards improving undergraduates' ICT skills for academic performance of educational technology undergraduates. It was recommended that institutions should integrate ICT into the curriculum, improve access to digital infrastructure, and provide continuous training.

Keywords: Information and Communication Technology (ICT) Skills, Academic Performance, Educational Technology, Undergraduates

INTRODUCTION

Academic performance of university undergraduates is their measured success in studies, typically via Grade Point Average (GPA), reflecting attainment of educational goals, but it's a complex outcome shaped by internal factors (study habits, motivation, anxiety) and external ones (social media, peer pressure, socioeconomics, teaching quality), influencing future opportunities and national development. It's assessed through grades, exams, and sometimes self-reporting, showing progress and capability. Educational technology undergraduate academic performance is a complex interplay of student effort, cognitive ability, external influences, and institutional support, ultimately reflecting their journey and success in higher education (Nwosu, 2023). Educational Technology (EdTech) prepares undergraduates to analyze, design, develop, and implement technological tools and strategies to improve teaching and learning, focusing on creating engaging, personalized, and effective learning environments through digital resources, instructional design, and innovative methods like virtual classrooms, Learning Management System (LMS), and interactive media, blending theory with practical application to enhance educational outcomes; so their academic performance matter a lot for future sustainability.

Good academic performance offers significant, long-term benefits to university undergraduates, spanning career opportunities, personal development, and overall well-being. Strong academic achievement is often a basic requirement for many employers and can provide a competitive edge in the job market, making it easier to land desirable entry-level positions. Good grades often lead to better initial job placements, quicker career progression, and higher earning potential, contributing to greater financial stability and an improved quality of life. High academic performance is crucial for admission to competitive graduate programmes and for securing merit-based scholarships and financial aid, which can reduce student debt and open doors to top-tier institutions. The process of striving for academic excellence involves developing skills such as research, problem-solving, time management, and communication that are highly valued by employers and directly applicable in the workforce (Najeem, 2025).

The falling academic performance of undergraduate is attributed to a wide array of interconnected factors, including individual student characteristics, the university environment, and external pressures and the strategy for impacting the instruction; that is why Okunuga (2025) lamented that the falling rate of undergraduates' academic performance could be attributed to decline in the standard of education. In the opinion of Ogujiofor et al. (2024), Educational Technology undergraduates need Information and Communication Technologies (ICTs) to boost academic performance by gaining vast resources, enabling personalized/self-paced learning,

fostering collaboration, improving engagement through interactivity (videos, simulations), developing crucial 21st-century digital skills, enhancing communication, and making learning more accessible (anytime, anywhere), ultimately leading to better understanding, critical thinking, and career readiness.

Undergraduates' ICT (Information and Communication Technology) skills are the essential abilities to use digital tools for academic, research, and professional success, encompassing core competencies like word processing, internet research, and presentation software (e.g., Word, PowerPoint) alongside advanced skills in data analysis, networking, cloud computing, and ethical digital communication to effectively manage, evaluate, and create information in the digital age (Ishaq et al., 2020). These skills are crucial for modern learning, allowing undergraduates to access vast resources, collaborate online, and prepare for the tech-driven job market. For instance, Usman and Abdulrazaq (2025) claimed that proficiency with operating systems, hardware, and peripherals (printers, scanners; skills to used tools like Microsoft Office (Word, Excel, PowerPoint) or Google Docs/Sheets for creating documents, spreadsheets, and presentations; efficiently searching, browsing, and locating reliable information online, including using library databases and skills or ability to effective use of email, social media, and video conferencing for academic and professional interaction were among ICT skills that have potential to aid Educational Technology undergraduates academic performance.

According to Azi and Shehu (2022), ICT skills for undergraduates' academic performance encompassed organizing, storing (cloud storage), and managing large datasets and digital files as well as skills in data processing and visualization to interpret complex information, skills in understanding network basics and digital security practices; basic web design or understanding of programming languages for specialized fields; skills in assessing the reliability, authority, and potential bias of online information; communicating and using digital information legally and ethically; and skills in applying ICT tools to solve academic challenges and fulfill information needs.

Information and Communication Technology (ICT) skills could aid undergraduates' academic performance by enhancing access to educational resources, promoting interactive and flexible learning environments, and developing crucial 21st-century skills (Ajokpaniovo & Adeyemi, 2020). Through ICT skills, undergraduates can access an unlimited range of information, e-books, online databases, research articles, and library resources beyond physical library walls and proficiency in using search engines, online databases, and information retrieval skills allows undergraduates to efficiently find relevant and authoritative information for their research and assignments, saving time and improving information quality. ICT tools like smartboards, educational apps, simulations, and multimedia presentations make learning more dynamic, interesting, and engaging, which improves concentration and comprehension. These skills cater to individual learning styles and paces, allowing students to revisit learning materials as needed, catch up on difficult topics, and take control of their educational process. Even undergraduates can access online courses, virtual lectures, and educational materials anytime, anywhere, fitting learning around their schedules and removing geographical and time constraints. In conclusion, utilizing ICT helps undergraduates acquire vital skills needed for the modern workforce, including digital literacy, critical thinking, problem-solving, and communication skills (Mohammad, 2024).

Statement of the Problem

Good undergraduates' academic performance offers substantial benefits that extend across professional, personal, and societal aspects of life. It serves as a foundation for future success by developing key skills, opening up opportunities, and contributing to overall well-being. However, observations have revealed that Educational Technology undergraduates academic performance is hampered by a mix of personal issues (mental health, poor sleep, procrastination, bad habits), social pressures (balancing studies with social life, peer influence, family expectations, financial stress), and academic environment factors (teaching methods, lack of resources, poor time management, distractions). These challenges often interact, creating a complex web that affects focus, motivation, and the ability to learn effectively, leading to lower grades and potential dropouts. Even, poor internet extraction skills can negatively affect academic performance by hindering the ability to locate, evaluate, synthesize, and properly cite relevant information for schoolwork. undergraduates who struggle with these skills may experience several consequence and low level of academic performance. This effect suggests that an initial small difference in academic success can generate an increasingly wider gap in overall life outcomes compared to their more successful peers. Thus, based on the ugly development, this study therefore sought to examine the influence of information and communication technology (ICT) skills on the academic performance of educational technology undergraduates in southwestern, Nigeria.

Objectives of the Study

The main objective of the study was to examine the influence of information and communication technology (ICT) skills on the academic performance of educational technology undergraduates in Southwestern, Nigeria. Specifically, the study sought to:

1. identify required information and communication technology (ICT) skills for academic performance of educational technology undergraduates;
2. ascertain the influence of ICT skills on the academic performance of educational technology undergraduates;
3. determine the issues affecting undergraduates' usage of ICT skills for academic performance of educational technology undergraduates;
4. itemize the strategies to be adopted towards improving undergraduates' ICT skills for academic performance of educational technology undergraduates.

Research Questions

The following research questions were guided this study:

1. What are the required information and communication technology (ICT) skills for academic performance of educational technology undergraduates?
2. To what extent does ICT skills influence the academic performance of educational technology undergraduates?
3. What are the issues affecting undergraduates' usage of ICT skills for academic performance of educational technology undergraduates?
4. What are the strategies to be adopted towards improving undergraduates' ICT skills for academic performance of educational technology undergraduates?

Theoretical Framework

Social Constructivism (Collaboration) Theory

The theoretical framework for this theory was Social Constructivism (Collaboration) Theory and this was propounded by Lev Vygotsky (1896-1934) in the early to mid-20th century, Social Constructivism (Collaboration) Theory, developed by Vygotsky, posited that learning is a social process where individuals co-construct knowledge through interaction, language, and shared cultural experiences, emphasizing collaboration with peers and knowledgeable guides (MKOs) to develop higher cognitive functions, moving understanding from the social to the individual level, contrasting with individual learning by highlighting context and community. Unlike individual constructivism (Piaget), social constructivism sees knowledge built collaboratively, not just by solitary discovery. Learning stems from human activity, culture, language, and interactions with others, not just physical experiences. In short, in a classroom, this means group projects, discussions, and hands-on activities where students teach and learn from each other, developing not just facts but also crucial social and self-management skills.

Also, Social Constructivism theory emphasizes that knowledge is collaboratively constructed through social interaction and communication. Applied to how Information and Communication Technologies (ICTs) skills aid undergraduates' academic performance, the theory highlights that ICT skills serve as powerful tools for facilitating the shared creation of knowledge, rather than just delivering information passively. Social constructivism posits that learning occurs most effectively when individuals interact with peers and experts to solve problems or discuss concepts. ICTs provide the platforms for these interactions. Platforms like Moodle or Canvas are hubs for interaction, enabling students to access shared resources and engage in group activities that mimic real-world problem-solving. These tools allow asynchronous communication where students can challenge ideas, ask questions, and build shared understanding over time, a core element of social constructivism. Tools like Google Docs or Microsoft 365 allow students to co-author papers, presentations, and projects simultaneously, necessitating negotiation of meaning and shared responsibility for the final output.

According to the theory, effective ICT skills enable undergraduates to interact seamlessly with both peers and instructors, breaking down geographical and temporal barriers; undergraduates use messaging apps, video conferencing, and social media groups to explain concepts to one another. This act of teaching reinforces their own understanding and collectively builds knowledge that might not be available solely through a textbook. ICTs facilitate quicker, more frequent feedback from lecturers via email or Virtual Learning Environment (VLE) grading tools. This timely guidance helps students adjust their understanding and performance dynamically within their learning community and that skilled use of ICTs allows undergraduates to move beyond local library resources to a global knowledge base. And that essential ICT skills involve not just finding information but evaluating its credibility. By sharing diverse, credible sources found online, students expose their group to a wider range of perspectives, enriching the collaboratively constructed understanding of complex subjects.

According to Social Constructivism (Collaboration) Theory, ICT skills do not improve performance just because they offer efficiency or access to information. Instead, they improve academic performance by empowering undergraduates to actively participate in knowledge-building communities. The mastery of ICTs facilitates richer, deeper, and more frequent collaborative interactions that are central to the learning process.

Relevance of the theory to this study

Social Constructivism, emphasizing collaborative knowledge building, is highly relevant to ICTs for undergraduates as technology (forums, video calls) facilitates the peer interaction and shared problem-solving central to the theory, transforming learners from passive receivers to active creators, boosting critical thinking, deeper understanding, and ultimately enhancing academic performance by enabling real-world, collaborative skill development. Also, ICTs provide platforms (wikis, shared docs) where students actively construct knowledge together, rather than passively receiving it, aligning perfectly with constructivism; tools like video conferencing, social media, and online platforms enable real-time or asynchronous group work, making Vygotsky's concept of learning through social interaction a reality; engaging in collaborative digital projects inherently builds essential ICT skills, like digital communication, information sharing, and using collaborative software; and explaining concepts to peers and receiving varied perspectives through ICT-mediated discussions pushes learners to clarify thoughts and gain deeper insights.

Furthermore, the theory's relevance to this theory through aiding collaborative challenges using ICTs encourage hypothesis testing, critical thinking, and reaching complex solutions together, fostering higher-order skills; reflecting on group processes and evaluating others' contributions, facilitated by technology, improves self-regulation and learning awareness; developing strong digital collaboration and communication skills via ICTs prepares undergraduates for the teamwork-focused demands of the modern workplace, researchgate.net notes; ICTs act as powerful "tools" (like shared screens or instant messaging) that help students achieve tasks with peers or instructors that they couldn't alone, as per Vygotsky's theory, and from online simulations to digital project management, ICTs shift focus from rote memorization to active experimentation and idea application. Thus, in conclusion, ICTs are not just tools but enablers that make the social, interactive, and cognitive processes of Social Constructivism scalable and effective in higher education, directly improving both technical and academic outcomes of undergraduates.

Methodology

A descriptive survey research design was used for the study. The population of this study comprised 2,421 Educational Technology undergraduates of Tai Solarin Federal University of Education, (TASFUED) Ijagun, Ogun State, and Adekunle Ajasin University (AAUA). For record purpose, TASFUED has a total of 1246 and AAUA has 1175 undergraduates. A total of 520 Educational Technology undergraduates of Tai Solarin Federal University of Education, (TASFUED), and Adekunle Ajasin University (AAUA) were selected as sample size using stratified sampling technique. However, 300 and 220 were selected from TASFUED and AAUA respectively. A self-researchers-designed instrument tagged Information and Communication Technology Skills and Academic Performance Questionnaire (ICTSAPQ) were used for this study. ICTSAPQ was used for the collection of data from the respondents on the required information and communication technology (ICT) skills for academic performance of educational technology undergraduates; influence of ICT skills on the academic performance of educational technology undergraduates; issues affecting undergraduates' usage of ICT skills for academic performance of educational technology undergraduates; and strategies to be adopted towards improving undergraduates' ICT skills for academic performance of educational technology undergraduates. The questionnaire will request responses on a four (4) – point scale format which was a modification of 5-point Likert scale. To ensure the face and content validity of the instrument, copies of the instrument was given to an expert in the Department of Educational Technology, Tai Solarin Federal University of Education.

Reliability test of the instrument was done using a test-retest method. In this case, copies of the instrument were administered twice on 15 Educational Technology undergraduates from the Emmanuel Alayande University of Education, that were not part of the sample size within a week interval. The collected data from the dual administration of the instruments was compared using Pearson Product Moment Correlation (PPMC) and reliability coefficient was reported as 0.79. Primary method of data collection was used in this study. Primary method includes the usage of questionnaire to collect data from the identified respondents. However, an introduction letter was collected from the Head of Department, Department of Educational Technology, TASFUED presented to the case study area to show the researcher's mission and reasons for conducting the study. Descriptive statistics of mean and standard deviation were used for answering research questions 1, 3 and 4. Research question 2 was analyses using inferential statistics of regression analysis.

Results

Presentation of Results

Research Question 1: What are the required information and communication technology (ICT) skills for academic performance of educational technology undergraduates?

Table 1: Mean and standard deviation responses on the required information and communication technology (ICT) skills for academic performance of educational technology undergraduates

Items	Mean	SD
I ascertained that basic computer proficiency skill is required.	3.12	.683
I know that keyboarding and word processing skill is required.	3.27	.636
I believed that data management and spreadsheets skill is required.	3.49	.689
I believed that presentation software skill is required.	3.67	.643
I believed that information literacy and critical evaluation skill is required.	3.19	.667
Cluster Mean	3.35	

Source: Field Survey, 2026

Table 1 revealed that cluster mean was 3.35 which greater than bench mark pf 2.50. This implied that basic computer proficiency skill, keyboarding and word processing skill, data management and spreadsheets skill, presentation software skill and information literacy and critical evaluation skill were among required information and communication technology (ICT) skills for academic performance of educational technology undergraduates.

Research Question 2: To what extent does ICT skills influence the academic performance of educational technology undergraduates?

Table 2: Extent ICT skills influence the academic performance of educational technology undergraduates

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	35.294	1.439		24.528	.000
	ICT skills	.114	.051	.100	2.227	.026

a. Dependent Variable: Academic performance

Table 2 showed that the sign of the coefficient of ICT skills is positive which implied that an increase or improvement in it will increase students' academic performance. The independent variables were found to be significant and strongly determine students' academic performance with the P-value less than 0.05 and magnitude of ICT skills ($\beta = .100$, $t = 2.227$, $P < .05$). The researchers concluded that about 10% increases in the academic performance of educational technology could be attributed towards ICT skills.

Research Question 3: What are the issues affecting undergraduates' usage of ICT skills for academic performance of educational technology undergraduates?

Table 3: Mean and standard deviation responses on the issues affecting undergraduates' usage of ICT skills for academic performance of educational technology undergraduates

Items	Mean	SD
I believed poor infrastructure and access limitations are issues.	2.76	.747
I believed skills and knowledge are gaps.	2.94	.798
I believed poor or unstable internet connectivity is a problem.	2.85	.857
I believed inconsistent power supply is a problem.	2.89	.822
I believed high cost of personal ICT devices (laptops, smartphones) and internet access creates a "digital divide are problems.	2.99	.873
Cluster Mean	2.89	

Source: Field Survey, 2026

Table 3 showed that cluster mean was 2.89 and greater than bench mark mean 2.50. This suggested that poor infrastructure and access limitations are issues, skills and knowledge are gaps, poor or unstable internet connectivity is a problem, inconsistent power supply is a problem and high cost of personal ICT devices (laptops, smartphones) and internet access creates a "digital divide are problems were among issues affecting undergraduates' usage of ICT skills for academic performance of educational technology undergraduates.

Research Question 4: What are the strategies to be adopted towards improving undergraduates' ICT skills for academic performance of educational technology undergraduates?

Table 4: Mean and standard deviation responses on the strategies to be adopted towards improving undergraduates' ICT skills for academic performance of educational technology undergraduates

Items	Mean	SD
I believed a blend of institutional support is a strategy.	2.80	.678
I believed integrate ICT into the curriculum is a strategy.	2.79	.632
I believed usage of student-centered learning approaches is among the strategies.	2.99	.699
I believed provide adequate infrastructure and access were among the strategies.	2.86	.619
Align university curricula with current industry needs.	2.58	.675
Cluster Mean	2.80	

Source: Field Survey, 2026

Table 4 showed that cluster mean was 2.80 and greater than bench mark mean value 2.50. This implied that institutional support is a strategy, integrate ICT into the curriculum is a strategy, usage of student-centered learning approaches, adequate infrastructure and access and align university curricula with current industry needs were among the strategies to be adopted towards improving undergraduates' ICT skills for academic performance of educational technology undergraduates

Discussion of Findings

The findings of the study showed that basic computer proficiency skill, keyboarding and word processing skill, data management and spreadsheets skill, presentation software skill and information literacy and critical evaluation skill were among required information and communication technology (ICT) skills for academic performance of educational technology undergraduates. These findings correlate with Najeem (2025) who found that required Information and Communication Technology (ICT) skills for academic performance include a blend of technical proficiency, information management, and digital citizenship. These competencies enable students to efficiently access, create, and communicate knowledge, directly impacting their ability to conduct research, collaborate on projects, and manage their academic workflow.

Also, the findings revealed that ICT skills positively influence academic performance of educational technology undergraduates. These findings were in tandem with Okunuga (2025) who Information and Communication Technology (ICT) skills significantly enhance university students' academic performance by facilitating efficient information access, improving engagement through interactive learning, and fostering independent study habits. These skills, including digital literacy and tool proficiency, improve knowledge retention, allow for flexible learning, and prepare students for modern, digital workplaces.

Furthermore, it was showed that poor infrastructure and access limitations are issues, skills and knowledge are gaps, poor or unstable internet connectivity is a problem, inconsistent power supply is a problem and high cost of personal ICT devices (laptops, smartphones) and internet access creates a "digital divide are problems were among issues affecting undergraduates' usage of ICT skills for academic performance of educational technology undergraduates. These findings were

in consonant with Onyebinama (2024) found that issues affecting Information and Communication Technology (ICT) skills usage by students in universities are multifaceted, ranging from infrastructural deficits to pedagogical and individual limitations. While many students possess basic digital literacy for social media and browsing, they often struggle with advanced, academic, or professional ICT applications.

It was found that institutional support is a strategy, integrate ICT into the curriculum is a strategy, usage of student-centered learning approaches, adequate infrastructure and access and align university curricula with current industry needs were among the strategies to be adopted towards improving undergraduates' ICT skills for academic performance of educational technology undergraduates. These findings corroborated with Umar et al. (2025) improving Information and Communication Technology (ICT) skills in universities for student usage requires a multi-faceted approach combining infrastructure development, curriculum integration, and targeted training programs. Key strategies include enhancing access to ICT facilities, integrating digital skills into all disciplines, promoting hands-on learning, and fostering digital literacy through workshops and certifications.

Conclusion

This study examined the influence of information and communication technology (ICT) skills on the academic performance of educational technology undergraduates in Southwestern; Nigeria and the following conclusions were drawn based on the findings of the study that basic computer proficiency skill, keyboarding and word processing skill, data management and spreadsheets skill, presentation software skill and information literacy and critical evaluation skill were among required information and communication technology (ICT) skills for academic performance of educational technology undergraduates; revealed that ICT skills positively influence academic performance of educational technology undergraduates, poor infrastructure and access limitations are issues, skills and knowledge are gaps, poor or unstable internet connectivity is a problem, inconsistent power supply is a problem and high cost of personal ICT devices (laptops, smartphones) and internet access creates a "digital divide are problems were among issues affecting undergraduates' usage of ICT skills for academic performance of educational technology undergraduates and that institutional support is a strategy, integrate ICT into the curriculum is a strategy, usage of student-centered learning approaches, adequate infrastructure and access and align university curricula with current industry needs were among the strategies to be adopted towards improving undergraduates' ICT skills for academic performance of educational technology undergraduates.

Recommendations

The following recommendations were raised in line with the findings of the study:

1. Institutions should integrate ICT into the curriculum, improve access to digital infrastructure, and provide continuous training.
2. Institutions should foster proficiency in educational software, boosting internet access for research, and encouraging the use of digital tools for collaborative learning.
3. Provide regular training and retraining for students and lecturers on emerging educational technologies.

4. Foster skills in using educational software, multimedia, simulations, and digital tools for content creation.
5. Universities should expand and upgrade ICT centers, offering reliable, high-speed internet connectivity, and up-to-date computer labs.
6. Ensure students have access to necessary devices such as laptops, tablets, and smartphones for academic purposes.

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