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IMPACT OF ICT COMPETENCE ON THE ACADEMIC PERFORMANCE OF OFFICE TECHNOLOGY AND MANAGEMENT (OTM) STUDENTS IN TERTIARY INSTITUTIONS IN DELTA STATE

BY

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Abstract.

This study examines the impact of ICT competence on the academic performance of Office Technology and Management (OTM) students in tertiary institutions in Delta State, Nigeria. ICT competence has become a critical requirement in modern office education due to the increasing digitalization of administrative processes and learning environments. The study adopted descriptive survey research design, the study was carried out in four tertiary institutions in Delta state namely Federal College of Education (Technical) Asaba, Delta State College of Education Warri, Delta state University Abraka and University of Delta Agbor. The population of the study comprised 102 students in OTM .Convenient sampling technique was used to select eighty (80) from the population of the study The instrument for data collection was a structured questionnaire tittled Impact of ICT Competence on the Academic Performance of Office Technology and Management Students in Tertiary Institutions in Delta State Questionaire (ITCCAPOTMSQ).The instrument was validated by two experts in measurement and evaluation Federal College of Education (Technical) Asaba and another from OTM department University of Delta Agbor. The corrections and recommendations provided were utilized to enhance the quality of the instrument employed for data collection. The reliability of the instrument was established using the Cronbach Alpha technique, which produced a reliability coefficient of 0.73, indicating that the instrument was reliable for the study. Mean and standard deviation were used to answer the research questions and analyze the data collected. The findings indicate that while ICT competence significantly enhances academic performance, the effectiveness of ICT integration in tertiary institutions largely depends on the availability of adequate infrastructure, institutional support, and continuous ICT training.Based on the findings, it was recommended that Tertiary institutions in Delta State should provide adequate ICT facilities such as modern computer laboratories, internet services, projectors, and digital

learning platforms to improve students' access to ICT tools. School management and government agencies should organize regular ICT training programmes and workshops for students and lecturers to improve digital competence and effective utilization of ICT tools in teaching and learning.

Keywords: ICT Competence, Academic Performance, Office Technology and Management Tertiary Institutions.

Introduction

The rapid advancement of Information and Communication Technology (ICT) has significantly transformed educational systems across the world, particularly in higher education institutions. ICT refers to digital technologies used for the processing, storage, retrieval, and dissemination of information, including computers, internet services, software applications, and mobile technologies (UNESCO, 2023). In modern education systems, ICT is widely recognized as a major catalyst for innovation that enhances teaching effectiveness and improves learning outcomes (World Bank, 2020).In contemporary academic environments, ICT competence has become a key determinant of students' academic success. ICT competence refers to the ability of learners to effectively use digital tools and applications for academic, communication, and problem-solving purposes (Van Laar et al., 2017). These skills include word processing, spreadsheet usage, presentation development, internet navigation, email communication, and the use of learning management systems. Studies have shown that students with higher ICT competence tend to perform better academically due to improved access to learning materials and more efficient study processes (Sánchez-Prieto et al., 2019).Office Technology and Management (OTM) is a vocational discipline designed to equip students with administrative, clerical, and technological competencies required in modern office environments. According to Nwosu and Ogidi (2019), OTM education prepares learners for efficient office operations through the use of modern office technologies. With the increasing digital transformation of workplaces, graduates are expected to possess strong ICT skills in order to remain relevant and competitive in the labour market (OECD, 2021).

ICT tools such as computers, word processing software, spreadsheets, internet services, email systems, and learning management platforms have become essential in teaching and learning processes within OTM programmes. These tools enhance students' academic engagement by promoting interactive learning, improving access to educational resources, and facilitating collaborative academic activities (Chang et al., 2021). Furthermore, Fraillon et al. (2020) emphasized that ICT integration enhances digital literacy and academic achievement among students. Despite these advantages, many students in developing countries still face challenges in

acquiring adequate ICT competence. In Nigeria, issues such as inadequate ICT infrastructure, poor internet connectivity, limited access to digital devices, and insufficient training opportunities continue to hinder effective ICT utilization in tertiary institutions (Iwu & Ike, 2022). These challenges are particularly evident among students in vocational programmes such as Office Technology and Management. Furthermore, the effectiveness of ICT integration in education depends on institutional support and lecturers' ability to incorporate digital tools into teaching practices. According to Eze et al. (2020), effective use of ICT in teaching enhances student engagement and academic performance. However, inadequate technical support and limited training opportunities often restrict the full implementation of ICT-based instruction in many tertiary institutions.In Delta State, tertiary institutions offering Office Technology and Management programmes are expected to produce graduates who are competent in both theoretical knowledge and practical ICT skills. However, concerns persist regarding whether students possess sufficient ICT competence required for academic success and workplace readiness. This situation necessitates empirical investigation into how ICT tools competence influences the academic performance of OTM students in tertiary institutions in Delta State, Nigeria.

Concept of Information and Communication Technology (ICT)

Information and Communication Technology (ICT) encompasses a variety of digital tools and technologies used for creating, processing, storing, retrieving, and exchanging information. These technologies include computers, internet facilities, mobile devices, software applications, telecommunication systems, and digital learning platforms. Within the educational sector, ICT plays a significant role in enhancing teaching, learning, research, and communication processes. According to UNESCO (2023), ICT facilitates access to educational resources, encourages interactive learning experiences, and promotes greater student participation in academic activities. The integration of ICT into higher education has transformed conventional teaching methods by supporting flexible, learner-centered, and collaborative learning approaches.

Concept of ICT Competence

ICT competence refers to an individual's ability to effectively and efficiently utilize digital technologies to accomplish academic, professional, and personal tasks. It comprises the knowledge, skills, and attitudes required to operate computers, use application software, navigate the internet, communicate through electronic platforms, and engage with online learning systems. Van Laar et al. (2017) described ICT competence as a combination of technical, cognitive, and social capabilities that enable individuals to function effectively in digital environments. For Office Technology and

Management students, ICT competence is essential for carrying out academic activities and preparing for technology-driven workplace responsibilities.

Concept of Academic Performance

Academic performance represents the extent to which students achieve their educational goals and learning objectives. It is often assessed through examinations, assignments, projects, presentations, class participation, and overall academic grades. Academic performance serves as a measure of students' mastery of knowledge and their ability to apply acquired skills effectively. Sánchez-Prieto et al. (2019) observed that students who possess strong ICT competencies generally demonstrate better academic outcomes because digital skills enhance access to information, improve learning efficiency, and support effective study practices.

Concept of Office Technology and Management (OTM)

Office Technology and Management (OTM) is a specialized area of business and vocational education aimed at developing administrative, managerial, technological, and communication competencies required in contemporary office environments. The programme equips students with both theoretical understanding and practical skills in office administration, information management, communication systems, and the use of modern office technologies. According to Nwosu and Ogidi (2019), OTM education is structured to prepare graduates for efficient performance in technology-oriented workplaces by providing training in the operation and management of digital office systems.

Theoretical Framework

Technology Acceptance Model (TAM)

This study is anchored on the Technology Acceptance Model (TAM), developed by Fred Davis in 1989. The model explains the factors that influence an individual's decision to adopt and use technology. TAM identifies two key determinants of technology acceptance: perceived usefulness and perceived ease of use. Perceived usefulness refers to the extent to which an individual believes that a particular technology will enhance performance, while perceived ease of use relates to the degree to which technology is considered simple and effortless to operate.

The model posits that when users perceive technology as beneficial and easy to use, they are more likely to adopt and utilize it effectively. In educational settings, students who recognize the value of

ICT tools and find them easy to operate are more likely to integrate them into their learning activities, thereby improving their academic performance.

Relevance of TAM to the Study

The Technology Acceptance Model is relevant to this study because it provides insight into the factors that influence OTM students' adoption and utilization of ICT tools. Students who perceive ICT technologies as useful and user-friendly are more likely to develop higher levels of ICT competence. Such competence can contribute positively to academic achievement by enhancing access to learning resources, facilitating communication, and improving the quality of academic tasks.

Connectivism Theory

The study is also supported by Connectivism Theory, proposed by George Siemens in 2005. The theory emphasizes the role of technology and digital networks in the learning process. Connectivism argues that knowledge is distributed across networks of information sources, and learning occurs through the ability to establish, maintain, and utilize connections within these networks. According to the theory, learners acquire knowledge not only through traditional classroom interactions but also through digital technologies, online communities, and virtual learning environments. Consequently, the capacity to access and navigate information networks becomes an essential component of effective learning.

Relevance of Connectivism Theory to the Study

Connectivism is applicable to this study because ICT tools provide students with opportunities to access online educational resources, engage in collaborative learning, participate in virtual discussions, and communicate with lecturers and peers. Students who possess strong ICT competence are better positioned to utilize these digital networks effectively, which can enhance learning experiences and improve academic performance.

Office Technology and Management education is designed to produce graduates who are proficient in modern office practices and capable of functioning effectively in technology-driven work environments. However, despite the integration of ICT into educational curricula, there is growing concern that many OTM students in tertiary institutions in Delta State still lack adequate ICT competence.Observations indicate that some students experience difficulties in performing basic ICT tasks such as word processing, internet research, spreadsheet operations, and the use of

presentation software. These deficiencies may negatively affect their academic performance, especially in courses that require practical application of ICT tools. Since ICT competence is now essential for academic success and employability, this situation raises serious concern among educators and stakeholders.In addition, many tertiary institutions face challenges such as inadequate ICT facilities, poor internet connectivity, insufficient computer laboratories, and irregular power supply. These constraints limit students' exposure to practical ICT training and reduce their ability to develop necessary digital skills.Furthermore, although ICT tools are expected to enhance teaching and learning processes, some lecturers may not fully integrate them into instructional delivery due to lack of training, technical support, or institutional resources. As a result, students may not receive adequate ICT-based learning experiences required to improve their academic performance.Given these challenges, there is uncertainty regarding the extent to which ICT tools competence influences the academic performance of Office Technology and Management students in Delta State. Therefore, this study seeks to empirically examine the relationship between ICT tools competence and students' academic performance in OTM programmes.

The main objective of this is to examine the impact of ICT tools competence on the academic performance of Office Technology and Management students in tertiary institutions in Delta State. Specifically, the study seeks to:

1. Examine the level of competence of Office Technology and Management students in the use of ICT tools for enhancing their academic performance in tertiary institutions in Delta State.

2. Determine the extent to which competence in ICT tools influences the academic performance of Office Technology and Management students in tertiary institutions in Delta State.

3. Identify the challenges associated with the use of ICT tools that affect the academic performance of Office Technology and Management students in tertiary institutions in Delta State.

1. What is the level of competence of Office Technology and Management students in the use of ICT tools for enhancing their academic performance in tertiary institutions in Delta State?
2. To what extent does competence in ICT tools influence the academic performance of Office Technology and Management students in tertiary institutions in Delta State?
3. How do the challenges associated with the use of ICT tools affect the academic performance of Office Technology and Management students in tertiary institutions in Delta State?

Concept of Information and Communication Technology (ICT)

Information and Communication Technology (ICT) encompasses a variety of digital tools and technologies used for creating, processing, storing, retrieving, and exchanging information. These technologies include computers, internet facilities, mobile devices, software applications, telecommunication systems, and digital learning platforms. Within the educational sector, ICT plays a significant role in enhancing teaching, learning, research, and communication processes. According to UNESCO (2023), ICT facilitates access to educational resources, encourages interactive learning experiences, and promotes greater student participation in academic activities. The integration of ICT into higher education has transformed conventional teaching methods by supporting flexible, learner-centered, and collaborative learning approaches.

Concept of ICT Competence

ICT competence refers to an individual's ability to effectively and efficiently utilize digital technologies to accomplish academic, professional, and personal tasks. It comprises the knowledge, skills, and attitudes required to operate computers, use application software, navigate the internet, communicate through electronic platforms, and engage with online learning systems. Van Laar et al. (2017) described ICT competence as a combination of technical, cognitive, and social capabilities that enable individuals to function effectively in digital environments. For Office Technology and Management students, ICT competence is essential for carrying out academic activities and preparing for technology-driven workplace responsibilities.

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Relevance of TAM to the Study

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Connectivism is applicable to this study because ICT tools provide students with opportunities to access online educational resources, engage in collaborative learning, participate in virtual discussions, and communicate with lecturers and peers. Students who possess strong ICT competence are better positioned to utilize these digital networks effectively, which can enhance learning experiences and improve academic performance.

Office Technology and Management education is designed to produce graduates who are proficient in modern office practices and capable of functioning effectively in technology-driven work environments. However, despite the integration of ICT into educational curricula, there is growing concern that many OTM students in tertiary institutions in Delta State still lack adequate ICT competence. Observations indicate that some students experience difficulties in performing basic ICT tasks such as word processing, internet research, spreadsheet operations, and the use of presentation software. These deficiencies may negatively affect their academic performance, especially in courses that require practical application of ICT tools. Since ICT competence is now essential for academic success and employability, this situation raises serious concern among educators and stakeholders. In addition, many tertiary institutions face challenges such as inadequate ICT facilities, poor internet connectivity, insufficient computer laboratories, and irregular power supply. These constraints limit students' exposure to practical ICT training and reduce their ability to develop necessary digital skills. Furthermore, although ICT tools are expected to enhance teaching and learning processes, some lecturers may not fully integrate them into instructional delivery due to lack of training, technical support, or institutional resources. As a result, students may not receive adequate ICT-based learning experiences required to improve their academic performance. Given these challenges, there is uncertainty regarding the extent to which ICT tools competence influences the academic performance of Office Technology and Management students in Delta State. Therefore, this study seeks to empirically examine the relationship between ICT tools competence and students' academic performance in OTM programmes.

Methods

The study adopted descriptive survey research design, the study was carried out in four tertiary institutions in Delta state namely Federal College of Education (Technical) Asaba, Delta State College of Education Warri, Delta state University Abraka and University of Delta Agbor. The population of the study comprised 102 students in OTM .Convenient sampling technique was used to select eighty (80) from the population of the study The instrument for data collection was a structured questionnaire tittled Impact of ICT Competence on the Academic Performance of Office Technology and Management Students in Tertiary Institutions in Delta State Questionaire (ITCCAPOTMSQ) which was used to obtain data for the study. The instrument had three response options which were in three clusters. Cluster 1 sought for information on level of competence of Office Technology and Management students in the use of ICT tools for enhancing their academic performance in tertiary institutions. Cluster 2 sought for information on how competence in ICT tools influence the academic performance of Office Technology and Management students. cluster 3 sought information on challenges associated with the use of ICT tools on academic performance. Each cluster contained 10 items, making it a total of 30 items. The items were rated on four point scale of strongly Agree (SA), Agree (A), Disagree (D),Strongly Disagree (SD), for research question 1 and Very High Extent (VHE) = 4, HighExtent(HE)=3, Low Extent (LE) =2, Very low Extent (VLE)=1 for research question 2. .The instrument was validated by two experts from measurement and evaluation department Federal College of Education (Technical) Asaba and another from OTM department University of Delta Agbor. The corrections and recommendations provided were utilized to enhance the quality of the instrument employed for data collection. The reliability of the instrument was established using the Cronbach Alpha technique, which produced a reliability coefficient of 0.73, indicating that the instrument was reliable for the study. A total of eighty (80) copies of the questionnaire were administered to the respondents in their respective locations with the assistance of two research assistants. All the distributed questionnaires were successfully retrieved, representing a 100% return rate. Mean and standard deviation were used to answer the research questions and analyze the data collected. The decision criterion stated that any item with a mean score of 2.50 and above was interpreted as Agree/High Extent, whereas any item with a mean score below 2.50 was regarded as Disagree/Low Extent.

Results

Research Question 1: What is the level of competence of Office Technology and Management students in the use of ICT tools for enhancing their academic performance in tertiary institutions in Delta State?

Table 1, Mean Ratings on the level of competence of Office Technology and Management students in the use of ICT tools for enhancing their academic performance in tertiary institutions in Delta State

S/N	ITEM	MEAN	SD	DECISION
1	I can effectively use a computer for academic activities.	3.35	0.83	Agree
2	I am competent in using Microsoft Word for preparing assignments.	3.41	0.83	Agree
3	I can use Microsoft Excel for academic calculations and data organization.	3.25	0.90	Agree
4	I am able to prepare presentations using Microsoft PowerPoint.	3.58	0.72	Agree
5	I can use the internet effectively for academic research.	3.22	0.97	Agree
6	I can download and upload academic materials online without assistance.	2.93	1.02	Agree
7	I can use email platforms for academic communication with lecturers and classmates.	2.88	0.94	Agree
8	I can operate printers, scanners, and other digital office devices effectively.	3.32	0.85	Agree
9	I can use online learning platforms such as Google Classroom or Moodle for learning activities.	3.08	0.98	Agree
10	My competence in ICT tools helps me perform academic tasks efficiently	3.16	0.94	Agree
	GRAND MEAN/SD	3.21	0.89	Agree

Source: Field Survey 2026

The analysis in Table 1 revealed that all the items recorded mean scores above the benchmark mean of 2.50, indicating agreement among the respondents that they possess competence in the use of ICT tools. The grand mean of 3.21 with a standard deviation of 0.89 showed that the respondents generally had a high level of ICT competence. Specifically, the respondents agreed that they could effectively use computers for academic activities (Mean = 3.35), Microsoft Word for assignments (Mean = 3.41), Microsoft Excel for calculations and data organization (Mean = 3.25), and PowerPoint for presentations (Mean = 3.58). They also agreed that they could effectively use the internet for research purposes, communicate through email platforms, operate digital office devices,

and use online learning platforms such as Google Classroom and Moodle. This implies that OTM students in tertiary institutions in Delta State possess adequate ICT competence needed for academic activities and effective learning.

Research Question 2: To what extent does competence in ICT tools influence the academic performance of Office Technology and Management students in tertiary institutions in Delta State?

Table 2;Mean Ratings on the extent to which competence in ICT tools influence the academic performance of Office Technology and Management students in tertiary institutions in Delta State

S/N	ITEM	MEAN	SD	DECISION
1	ICT competence improves my understanding of OTM courses.	3.06	0.87	High Extent
2	My ICT skills help me complete assignments accurately and on time.	3.32	0.92	High Extent
3	ICT competence enhances my performance in practical OTM courses.	2.98	0.98	High Extent
4	The use of ICT tools has improved my overall academic achievement.	2.98	0.99	High Extent
5	ICT tools help me access relevant learning materials for my studies.	3.38	0.88	High Extent
6	ICT competence increases my participation in classroom and online learning activities.	2.86	0.91	High Extent
7	My ability to use ICT tools positively affects my examination performance.	3.28	0.92	High Extent
8	ICT competence helps me prepare quality seminar and project presentations.	3.16	0.94	High Extent
9	The use of ICT tools enhances my learning effectiveness in OTM courses.	3.31	0.84	High Extent
10	Students with high ICT competence tend to perform better academically.	3.01	0.93	High Extent
	GRAND MEAN/SD	3.14	0.91	High Extent

Source: Field Survey 2026

The anaysis in Table 2 showed that all the items had mean scores above 2.50, indicating that ICT competence influences the academic performance of OTM students to a high extent. The grand mean of 3.14 and standard deviation of 0.91 confirmed this position.

The respondents agreed that ICT competence improves their understanding of OTM courses (Mean = 3.06), helps them complete assignments accurately and on time (Mean = 3.32), enhances performance in practical courses (Mean = 2.98), and improves overall academic achievement (Mean = 2.98). They also agreed that ICT tools provide access to relevant learning materials, improve classroom participation, enhance examination performance, and help students prepare quality seminar and project presentations.The implication is that ICT competence plays a significant role in improving the academic performance and learning effectiveness of OTM students

Research Question 3: How do the challenges associated with the use of ICT tools affect the academic performance of Office Technology and Management students in tertiary institutions in Delta State?

Table 3:Mean Ratings on how the challenges associated with the use of ICT tools affect the academic performance of Office Technology and Management students in tertiary institutions in Delta State.

S/N	ITEM	MEAN	SD	DECISION
1	Inadequate ICT facilities affect my academic performance.	3.04	0.90	Agree
2	Poor internet connectivity limits my use of ICT tools for learning.	3.26	0.90	Agree
3	Frequent power outages negatively affect my use of ICT tools for academic work.	3.03	0.97	Agree
4	Lack of adequate ICT training affects my academic performance.	3.09	1.06	Agree
5	High cost of ICT devices limits my access to digital learning resources.	3.40	0.89	Agree
6	Insufficient computer laboratories reduce students' opportunity for ICT practice.	2.90	1.06	Agree
7	Lack of technical support affects effective use of ICT tools for learning.	3.26	0.90	Agree
8	Limited access to ICT tools negatively affects students' academic achievement.	3.18	0.96	Agree

9	Limited access to ICT tools negatively affects students' academic achievement.	3.04	1.04	Agree
10	Inadequate institutional support for ICT usage affects students' academic performance.	3.34	0.95	Agree
	GRAND MEAN	3.15	0.96	Agree

Source: Field Survey 2026

The analysis in Table 3 indicated that all the identified challenges had mean scores above the criterion mean of 2.50. The grand mean of 3.15 and standard deviation of 0.96 showed that the respondents agreed that several ICT-related challenges negatively affect their academic performance. The respondents agreed that inadequate ICT facilities, poor internet connectivity, frequent power outages, lack of ICT training, high cost of ICT devices, insufficient computer laboratories, lack of technical support, limited access to ICT tools, and inadequate institutional support significantly affect their academic performance. The highest mean score was recorded for the high cost of ICT devices (Mean = 3.40), indicating that it is one of the major challenges faced by student.This suggests that despite the positive impact of ICT competence on academic performance, students still face serious infrastructural and institutional barriers that hinder effective ICT utilization.

Discussion of Findings

The findings of the study revealed that Office Technology and Management students in tertiary institutions in Delta State possess a considerable level of ICT competence. This finding agrees with the view of Sánchez-Prieto et al. that ICT competence improves students' learning effectiveness and academic productivity. The ability of students to use computers, Microsoft Office applications, internet facilities, and online learning platforms demonstrates that ICT has become an essential component of modern education and office management training.

The study further revealed that ICT competence positively influences students' academic performance to a high extent. Students indicated that ICT skills enhance assignment completion, classroom participation, access to learning materials, examination performance, and project presentations. This finding supports the assertion of UNESCO that ICT integration improves teaching and learning outcomes in higher education institutions. It also aligns with the findings of Chang et al. and Eze and Chinedu-Eze (2020) who emphasized that ICT usage enhances academic achievement and student engagement. However, the study also found that several challenges hinder the effective use of ICT tools among OTM students. These challenges include poor internet connectivity, inadequate ICT facilities, unstable electricity supply, lack of adequate ICT training,

and the high cost of digital devices. This finding corroborates the work of Iwu and Ike (2022) who observed that infrastructural deficiencies remain a major obstacle to ICT adoption in Nigerian tertiary institutions. These limitations reduce students' opportunities to fully utilize ICT tools for learning and academic development.

Overall, the findings indicate that while ICT competence significantly enhances academic performance, the effectiveness of ICT integration in tertiary institutions largely depends on the availability of adequate infrastructure, institutional support, and continuous ICT training.

Conclusion

The study concluded that Office Technology and Management students in tertiary institutions in Delta State possess a relatively high level of ICT competence, which positively influences their academic performance. ICT competence enables students to effectively complete assignments, conduct academic research, participate in online learning activities, and improve their overall learning outcomes.

Despite these benefits, several challenges such as inadequate ICT facilities, poor internet connectivity, frequent power supply issues, insufficient ICT training, and limited institutional support continue to hinder effective ICT utilization among students. Therefore, for ICT competence to fully enhance academic performance, tertiary institutions must provide adequate technological infrastructure, regular ICT training, and supportive learning environments.

Recommendations

Tertiary institutions in Delta State should provide adequate ICT facilities such as modern computer laboratories, internet services, projectors, and digital learning platforms to improve students' access to ICT tools.

School management and government agencies should organize regular ICT training programmes and workshops for students and lecturers to improve digital competence and effective utilization of ICT tools in teaching and learning.

Institutions should ensure stable internet connectivity and improved electricity supply to support uninterrupted ICT-based academic activities.

Government and educational stakeholders should subsidize the cost of ICT devices and internet access for students to enhance accessibility to digital learning resources.

Lecturers should integrate ICT tools more effectively into instructional delivery to encourage practical learning experiences and improve students' academic performance.

References

Adebayo, F. A., & Akanbi, O. A. (2018). ICT infrastructure and students' academic performance in Nigeria. *Journal of Educational Technology, 12*(2), 45–56.

Chang, C. Y., Shen, H. Y., & Liu, E. Z. F. (2021). University students' self-regulation, engagement and performance in online learning environments. *Computers & Education, 167*, 104–120. https://doi.org/10.1016/j.compedu.2021.104120

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Eze, S. C., & Chinedu-Eze, V. C. (2020). ICT integration and students' academic performance in Nigerian tertiary institutions. *Education and Information Technologies, 25*(4), 1–15. https://doi.org/10.2307/249008

Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Duckworth, D. (2020). *Preparing for life in a digital world: IEA international computer and information literacy study*. Springer.https://doi.org/10.1007/978-3-030-38781-5

Iwu, C. G., & Ike, C. C. (2022). Challenges of ICT adoption in Nigerian higher education. *African Journal of Higher Education Studies, 8*(1), 33–47.

Nwosu, B. O., & Ogidi, R. C. (2019). Office Technology and Management education in Nigerian tertiary institutions. *Journal of Vocational Education, 14*(1), 22–31.

Organisation for Economic Co-operation and Development (OECD). (2021). *21st century skills and digital transformation in education*. OECD Publishing. https://doi.org/10.1787/9789264317036-en

Sánchez-Prieto, J. C., Olmos-Migueláñez, S., & García-Peñalvo, F. J. (2019). ICT competence and academic performance. *Education and Information Technologies, 24*(3), 1–18. https://doi.org/10.1007/s10639-018-09852-5

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning, 2*(1), 3–10.

United Nations Educational, Scientific and Cultural Organization (UNESCO). (2023). *Information and communication technology in education: A global framework*. UNESCO Publishing.

Van Laar, E., Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & De Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior, 72*, 577–588. https://doi.org/10.1016/j.chb.2017.03.010

World Bank. (2020). *Education technology in developing countries: Policy and practice*. World Bank Publications.