



Educational Strategies for Higher Education Students: Leveraging Digitalization to Build a Resilient Future

Dr Osah I. Mark

Department of Social Science Education Delta State University, Abraka
osahmark@gmail.com
08035747263

Ezene O. Stanley

Department of Social Science Education Delta State University, Abraka
ezenestanley@gmail.com
08102982624

Abstract

This study examines educational strategies for higher education students, focusing on digitalization's pivotal role in fostering resilience for the future. It explores five research questions through a comprehensive literature review that establishes a robust theoretical foundation. Utilizing a survey design, data were collected from a sample of 348 undergraduates in the Faculty of Education at Delta State University, Abraka, representing 8% of the population of 4,353. A structured questionnaire, divided into six sections, facilitated the gathering of pertinent information, with analyses conducted using frequencies, percentages, and statistical means. Findings indicate that various digital tools, including Learning Management Systems (LMS), collaborative platforms, and artificial intelligence (AI) technologies, significantly enhance the learning experience. Students recognize the crucial role of these resources in enabling personalized learning and fostering engagement, thereby bolstering resilience against future uncertainties. However, a troubling gap in student exposure to these technologies persists, compounded by challenges such as inadequate instructor guidance, technical skill deficits, and accessibility issues. The study underscores the necessity of implementing comprehensive digital literacy programs, mentorship opportunities, and improved technological infrastructure. By addressing these challenges, educational institutions can effectively equip students to navigate the digital landscape, cultivating a generation of resilient and capable learners.

Keywords: Educational Strategies; Artificial Intelligence; Digital Literacy Tools; Learning Management System; Higher Education



Introduction

Amidst the rapidly evolving global landscape, Nigeria is by no means exempt from the imperative to align with contemporary trends in education, particularly within its tertiary institutions, often synonymous with higher learning. It is essential for students to cultivate adaptability and foresight, thereby constructing a resilient future capable of addressing the nuanced demands of both their immediate communities and the nation as a whole. As Kalu and Imo (2023) assert, to effectively foster resilience in students, educational institutions must implement innovative and advanced learning methodologies that go beyond traditional pedagogical approaches. By incorporating higher-order learning strategies, institutions can enhance critical thinking, adaptability, and problem-solving skills—qualities essential for navigating the complexities of today's world. This educational paradigm not only improves academic outcomes but also empowers students to confront global challenges with confidence and competence. By equipping learners with the tools for continuous growth and development, institutions create environments conducive to success in an increasingly competitive global landscape. Furthermore, integrating technology, experiential learning, and interdisciplinary approaches can significantly enhance students' ability to adapt to change and innovate. Consequently, prioritizing advanced learning methods is fundamental to nurturing a future-ready generation poised to drive progress, make meaningful contributions to society, and achieve global success.

Moreover, the integration of advanced learning methodologies guarantees students transition from being mere passive recipients of information to active participants in their educational pursuits. This transformation, moving away from rote memorization towards profound and reflective learning, empowers students to internalize knowledge, apply it in real-world scenarios, and innovate beyond established paradigms. As the global landscape increasingly becomes interwoven and driven by technology, the capacity for critical thinking, interdisciplinary collaboration, and a commitment to lifelong learning emerges as essential. This paradigm shift can be significantly enhanced through the strategic leveraging of digitalization (Dancsa, Stempel'ová, Taká, & Annu, 2023).

Ordov, et al., (2019) contended that the phenomenon of digitalization in education epitomizes the metamorphosis of conventional pedagogical paradigms through the assimilation of advanced digital technologies. This encompasses the employment of online platforms, virtual classrooms, digital resources, and interactive tools designed to augment accessibility, tailor learning experiences, and enhance educational outcomes. Similarly, Dreimane and Upenieks (2022) characterized digitalization in education as the seamless integration of digital technologies into the teaching, learning, and administrative frameworks of educational institutions. This paradigm shift redefines traditional educational methodologies by incorporating instruments such as online learning platforms, interactive software, digital textbooks, and virtual classrooms. Such transformations not only bolster accessibility, enabling students to engage in learning from any location at any time, but also furnish educators with sophisticated tools for personalized instruction, real-time feedback, and data-driven assessments. Furthermore, Dreimane and Upenieks (2022) elucidated that digitalization engenders collaborative learning environments through digital platforms, facilitating interactions among students and educators on a global scale. Additionally, it primes students for participation in a digital economy by equipping them with critical skills, including digital literacy, analytical thinking, and technological adeptness.

Haleem, et al., (2022) posited that the integration of digitalization into higher education frameworks is imperative for cultivating a resilient future in which students can



flourish within an increasingly interconnected and technologically advanced society. Essential educational strategies encompass the adoption of e-learning platforms, virtual classrooms, and adaptive learning technologies, which collectively facilitate flexible and personalized learning experiences. These innovations significantly enhance accessibility, empowering students to progress at their own pace and from any location, thus transcending the constraints of traditional educational environments. Furthermore, collaborative digital instruments—such as discussion forums, group chats, and project management software—foster teamwork and critical thinking, both of which are vital for addressing complex real-world challenges. Additionally, the application of data analytics offers timely feedback on student performance, enabling educators to customize their instructional approaches to better address individual learning needs and enhance overall educational outcomes. Moreover, the incorporation of digital literacy within the curriculum effectively equips students for future employment, imparting essential competencies such as coding, digital communication, and cybersecurity. These strategies not only bolster academic achievement but also encourage adaptability, creativity, and innovation, thereby ensuring that students are well-prepared to navigate the demands of a rapidly evolving global landscape (Shaikh, 2024).

Despite the numerous advantages of digitalization in enhancing educational communication and networking, both students and lecturers encounter considerable obstacles in its implementation. Kalu and Imo (2023) observed that in developing nations such as Nigeria, the transformative potential of digitalized pedagogy remains largely underutilized. Various impediments, including the exorbitant costs associated with computer acquisition, restricted internet access, and erratic power supply, significantly hinder its effective deployment. Additionally, while digital tools inherently offer substantial educational benefits, a considerable number of students tend to prioritize social interactions over academic applications, often viewing these platforms as non-educational in nature. Adelakun, Omolola, Mosaku, and Adebola (2022) further elucidated that these prevailing perceptions, coupled with the aforementioned challenges, render the integration of digitalization into higher education an exceedingly formidable undertaking.

In an increasingly digitalized world, higher education institutions are compelled to evolve by incorporating digital tools and strategies that cultivate a resilient and future-ready student demographic. However, despite the global momentum toward educational digitalization, numerous students in higher education—particularly those enrolled in the Faculty of Education at Delta State University, Abraka—grapple with the effective utilization of digital learning instruments. Although these tools inherently provide enhanced flexibility, accessibility, and opportunities for collaboration, many students exhibit a notable deficiency in the requisite digital literacy and engagement needed to derive their full benefits. Observational evidence indicates that a significant number of students underutilize educational technologies, opting instead for traditional learning methodologies or misappropriating digital platforms primarily for social interactions, thereby constraining their academic potential. This predicament is further exacerbated by infrastructural impediments, including inadequate internet connectivity, erratic power supply, and a lack of sufficient institutional support, all of which severely obstruct the successful implementation of digital strategies. Consequently, a pronounced disconnect has emerged between the anticipated benefits of digitalization and the actual academic performance of students. This study endeavors to explore the challenges and strategies associated with harnessing digitalization to foster a resilient academic future, with a particular focus on undergraduates within the Faculty of Education at Delta State University, Abraka.



Digital tools and technologies encompass a broad spectrum of software, applications, platforms, and resources—both online and offline—that are utilized through computers, mobile devices, or other digital apparatus. The concept of digitalism, also referred to as digitality, characterizes the phenomenon of existing within a digital culture, emerging as a byproduct of the Digital Revolution, commonly recognized as the Third Industrial Revolution. This revolution signifies the transition from analog and mechanical electronic technologies to computerized systems, a transformation that began in the latter half of the 20th century with the advent and proliferation of digital computers and digital record-keeping methodologies. Educational systems have not been immune to the pervasive influence of digitalism. Over time, the evolution of new technologies has precipitated a concurrent reformation of pedagogical methodologies and educational practices. For instance, a university graduate from two decades ago was largely unacquainted with digital technology. The inception of the internet in the early 1990s rendered web-based learning a distant possibility, and the terms “social” and “media” were not commonly associated. However, substantial advancements have since occurred, resulting in contemporary classrooms reflecting the myriad innovations that have transpired. Consequently, advanced educational frameworks and digital tools have emerged, although their integration remains inconsistent across various educational environments (Kalu & Imo, 2023)

According to Adelakun et al. (2022), digital tools and technologies encompass an array of software, applications, platforms, and resources—whether online or offline—that can be employed via computers, mobile devices, or other digital gadgets. The term digitalism, also known as digitality, denotes the state of existence within a digital culture, emerging as a consequence of the Digital Revolution, frequently referred to as the Third Industrial Revolution. This revolution signifies the transition from analog and mechanical electronic technologies to computerized systems, a shift that began in the latter half of the 20th century, marked by the adoption and expansion of digital computers and digital record-keeping methods. The educational sector has been profoundly impacted by the forces of digitalism. Over time, the advent of new technologies has catalyzed a parallel transformation in pedagogical approaches and educational practices. For instance, a university graduate two decades ago was largely inexperienced in the realm of digital technology. The early 1990s saw the introduction of the internet, a period when web-based learning was nearly inconceivable, and the terms “social” and “media” were not yet intertwined. In contrast, contemporary classrooms reflect the significant innovations that have occurred since then. As a result of this transformation, sophisticated educational frameworks and digital tools have emerged, although their prevalence varies across different educational settings (Kalu & Imo, 2023).

The globalization of education has rendered the incorporation of digital technologies imperative, compelling academic institutions to embrace online platforms for a myriad of functions, including teaching, resource sharing, assessments, and the management of daily operations. Initially, these platforms were utilized in a proactive manner; however, the onset of the COVID-19 pandemic necessitated that both educators and students fully transition to an online teaching model to ensure educational continuity. While developed nations were generally well-equipped to tackle this exigency, developing countries faced significant challenges in rapidly adapting to the newfound demands of digital learning. In this pivotal moment, digital technologies emerged as a crucial lifeline for the educational sector (Haleem, Javaid, Qadri, & Suman, 2022). The integration of digital tools, such as computers and mobile devices, empowered students to assume a more active and productive role in their educational journeys, while educators were enabled to guide and assess the efficacy of



learning outcomes. An expansive array of digital resources became accessible, allowing learners to download essential information or contribute their own content. Through online platforms, students began to generate their own material, collaborate with peers, and engage in reciprocal evaluations of each other's work, fostering a spirit of co-learning. This paradigm shift rendered education more engaging and meaningful (Udvaros, Gubán, & Gubán, 2019; Wang, Li, Tian, Zakuan, & Rani, 2023). Consequently, digital tools and technologies—including electronic devices, software, and online platforms—have become foundational in transforming the educational landscape and enriching students' learning experiences (Dancsa, tempel'ová, Taká, & Annu, 2023)

In their seminal work titled *Digital Tools in Education*, Dancsa et al. (2023) elucidate a plethora of digital instruments utilized to enrich the educational experience and address the diverse developmental needs of students on a global scale. These tools—comprising c-learning platforms, multimedia applications, and collaborative software—are meticulously crafted to augment students' learning capacities, critical thinking skills, and peer interactions. Similarly, Okokoyo, Emiko-Agbajor, Chenube, and Oji (2023) assert that digital tools and technologies significantly enhance students' educational experiences by fostering interactivity, personalization, and accessibility. Learning Management Systems (LMS), such as Google Classroom and Moodle, facilitate the efficient delivery of lessons, assessments, and communication between educators and learners. Furthermore, technologies such as Virtual Reality (VR) and Augmented Reality (AR) offer immersive experiences, enduring complex subjects—like science, history, and art—more engaging and comprehensible. Mobile learning applications, including Duolingo and Khan Academy, provide flexible, on-the-go educational opportunities tailored to individual learning preferences. Collaborative tools such as Microsoft Teams and Zoom promote teamwork, enabling students to connect and collaborate on projects in real time, irrespective of geographical constraints. Moreover, gamified learning platforms like Kahoot and Quiziet enhance motivation by transforming the learning process into a fun and competitive endeavor, thereby improving information retention. Additionally, Artificial Intelligence (AI) tools create personalized learning trajectories, offering students real-time feedback and allowing them to progress at their own pace.

According to Haleem, Javaid, Qadri, and Suman (2022), the proliferation of e-learning platforms, mobile applications, and interactive software has rendered a vast repository of information and resources readily available to students. These digital instruments cultivate a more engaging and personalized learning atmosphere, facilitating learners' comprehension of intricate concepts through the utilization of simulations, videos, and gamified content. Technologies such as Virtual Reality (VR) and Augmented Reality (AR) provide immersive experiences that significantly enhance understanding, particularly in disciplines such as science, history, and art. Moreover, collaborative platforms like Google Classroom and Microsoft Teams enable real-time cooperation among students, irrespective of geographical constraints, thereby fostering teamwork and enhancing communication skills. Additionally, Artificial Intelligence (AI) and Machine Learning (ML) algorithms deliver personalized feedback and tailor learning pathways based on individual student needs and progress, thus promoting self-paced learning. These digital innovations not only augment the flexibility and accessibility of education but also adequately prepare students for a technology-driven future, by integrating these digital tools, educators can craft dynamic, interactive, and effective learning environments that bolster academic performance and engagement, rendering education more inclusive and adaptable to various learning styles. In alignment with this perspective, Dancsa et al. (2023) argue that digital tools and technologies fundamentally



transform students' learning experiences by fostering engagement, collaboration, and personalized education. These innovations make learning more accessible and dynamic, allowing students to tailor their educational experiences to their individual needs and styles. Learning Management Systems (LMS) such as Google Classroom and Moodle streamline the delivery of lessons, communication, and assessments, establishing a centralized hub for educators and learners alike. Interactive technologies, including VR and AR, immerse students in simulated environments, making learning particularly engaging for subjects like science, history, and geography.

Furthermore, Abid, Mohd, Mohd, and Rajiv (2022) highlight that mobile learning applications like Duolingo and Khan Academy afford students the flexibility to learn anytime and anywhere, offering customized content that adjusts to their progress. Collaborative tools such as Microsoft Teams and Zoom facilitate teamwork, enabling students to engage in group projects, and discussions, regardless of their physical locations. Gamified learning platforms like Kahoot! and Quizlet enhance motivation and retention by infusing fun, competitive elements into the educational process. Additionally, AI tools provide adaptive feedback and support, creating personalized learning pathways that help students advance at their own pace. Collectively, these digital tools and technologies enrich learning by rendering it more interactive, efficient, and centered on the student (Nazirul I. Sarker et al., 2019)

Adelakun, Omolola, Mosaku, and Adebola (2022) argue that digital tools and technologies serve as pivotal instruments in cultivating resilience among students, endowing them with the adaptability and skills necessary to confront future challenges and uncertainties. These digital resources encourage autonomous learning, fostering the development of problem-solving abilities and promoting a growth-oriented mindset. With access to expansive online materials, students are empowered to take control of their educational journey, allowing them to navigate intricate information systems and adjust to evolving circumstances. Furthermore, collaborative platforms like Microsoft Teams and Zoom enhance teamwork and foster global connections, thereby equipping students for a progressively interconnected world where remote collaboration is increasingly prevalent. Additionally, Artificial Intelligence (AI) and data analytics provide tailored feedback, enabling learners to identify areas for improvement and engage in continuous development. This personalized learning approach nurtures resilience by teaching students to learn from errors, adapt their strategies, and persist through challenges. Gamified learning environments also contribute to the development of resilience by presenting adaptive challenges that promote critical thinking and perseverance. Exposure to these rapid technological advancements prepares students for future disruptions across diverse industries, ensuring they are flexible and well-prepared for unforeseen changes. By integrating these digital technologies into educational frameworks, students are transformed into adaptive, resilient learners capable of problem-solving in an unpredictable and fast-evolving world (Dinim, 2018).

In examining the application of digital tools within educational contexts, Gatiti (2021) conducted a descriptive study titled *An Empirical Study of the Use of Tools and Technologies for Knowledge Sharing in Development Organisations in Kenya*. This research aimed to explore the use of ICT tools, social media platforms, and collaborative technologies in the dissemination and sharing of knowledge. The study employed a survey questionnaire as the primary instrument for data collection, which was administered directly by the researcher. The study population included 331 development practitioners from 500 development organizations in Kenya, with a pilot study involving nine practitioners. The



reliability of the instrument was tested through Cronbach's alpha coefficient to ensure consistency. Quantitative data were analyzed using SPSS, incorporating both descriptive and inferential statistical methods. Descriptive analysis focused on measures of central tendency, while inferential statistics assessed correlations and associations. The results demonstrated that digital technologies act as key enablers in the processes of knowledge extraction, sharing, and dissemination. These tools have had a profound influence on the SECI knowledge creation model—comprising socialization, externalization, combination, and internalization processes. Among the benefits highlighted were improved knowledge preservation, access, storage, documentation, and gathering. While Gatiti's study shares similarities with our research regarding the advantages of technology and digital tools in knowledge sharing and information access, it focuses on development practices.

Adelakun, Omolola, Mosaku, and Adebola (2022), in their study titled Empirical Study on Electronic Learning System: Benefits, Challenges and Prospects, employed an empirical methodology to assess the advantages and obstacles inherent in the use of e-learning systems. The researchers distributed an online questionnaire to students at the Federal Polytechnic Ilaro, Nigeria, aiming to evaluate both the benefits and potential difficulties encountered with e-learning platforms. The study gathered a total of 495 responses, and the data were analyzed using descriptive statistical methods. The findings revealed that 33.94% of students reported weak internet connectivity as a significant issue, a challenge commonly faced in many developing nations. In contrast, only 7.27% of respondents cited limited feedback as a problem. Key benefits identified included the efficient distribution of learning resources, the capacity to serve a large number of students at a relatively low cost, ease in creating study materials, promotion of active and independent learning, as well as the flexibility and personalization Offered by self-paced learning. The authors recommended the implementation of robust IT infrastructure, reliable internet connectivity, and the development of user-friendly e-learning platforms to improve the effectiveness of e-learning systems, enhance student performance, and boost aver all productivity. This study shares similarities with our research, particularly in its exploration of the impact and advantages of digital tools such as e-learning platforms on educational processes. However, a key distinction lies in the fact that their study focuses on the benefits of a singular digital tool, whereas our research addresses a broader array of digital tools within the educational context.

Despite the advantages of digital tools and technologies in cultivating resilience and equipping students for future uncertainties, access to these critical resources remains limited in many parts of Africa. The availability of digital tools such as e-learning platforms, collaborative technologies, and artificial intelligence is unevenly distributed, primarily due to infrastructural deficits, restricted internet connectivity, and the prohibitive costs associated with technological acquisition. Tusiime, Johannesen, and Gudmundsdottir (2019) emphasize that while these tools hold great potential to empower students by fostering critical thinking, problem-solving, and adaptability, their impact is severely undermined by the lack of widespread access within African educational settings. This pervasive digital divide curtails students' capacity to fully engage with the technological innovations necessary for navigating an increasingly unpredictable and technology-driven future. Consequently, many African students remain disadvantaged, reducing their preparedness to confront global challenges and diminishing opportunities for personal and professional advancement. Chhaya and Ravindra (2017) further observed that students encounter multiple barriers when accessing and utilizing digital tools, especially in areas with limited infrastructural development. A key issue is the digital divide, where many students lack stable internet connectivity, electricity,



or essential devices like laptops and smartphones, thus impeding their participation in digital learning environments. Exorbitant costs for both technology and internet services exacerbate the situation, particularly in lower-income regions. Additionally, insufficient digital literacy hinders students' effective use of these resources, while frequent power outages disrupt access. Cultural and language discrepancies in digital content also reduce user engagement, as many platforms fail to accommodate diverse needs. Collectively, these financial, infrastructural, and technical challenges significantly impede students' ability to reap the full benefits of digital education.

Tenya, Mama, and Awuor (2023) assert that students encounter significant difficulties in accessing and utilizing digital tools, particularly in regions burdened by insufficient infrastructure. A primary challenge is the lack of consistent access to reliable internet and essential technological devices, such as computers, tablets, and smartphones, which are critical for effective digital learning. The financial burden of acquiring and maintaining these devices further exacerbates this issue, particularly in economically disadvantaged areas. Furthermore, insufficient digital literacy prevents many students from fully engaging with online platforms and resources, thereby limiting their capacity to benefit from digital learning opportunities. The situation is worsened by inconsistent electricity supply and inadequate technical support, which further disrupts access to these tools. Additionally, language barriers and culturally irrelevant content diminish the overall efficacy of digital learning solutions, hindering their ability to meet diverse educational needs.

Research Questions

The study is guided by the following research questions:

1. What digital tools and technologies enhance students' learning experiences?
2. What role do digital tools and technologies play in enhancing students' learning experiences?
3. How do students perceive the impact of digital tools and technologies in fostering resilience for future challenges and uncertainties?
4. To what extent are students exposed to digital tools that prepare them for future challenges?
5. What challenges do students face in accessing and using digital tools?

Methods

The research explored educational strategies for higher education students, particularly focusing on how digitalization can be leveraged to foster resilience, with a specific emphasis on the Faculty of Education students at Delta State University, Abraka. Employing a descriptive research design, this approach was selected for its capacity to promptly gather objective data from participants. Descriptive research is esteemed for its impartiality, extensive scope, and ability to lay a solid foundation for informed decision-making. The study's target population consisted of 4,353 students T from the Faculty of Education at Delta State University. A representative sample of 348, undergraduate students, equating to 8% of the total population, was chosen. The simple random sampling technique was utilized, ensuring that each individual had an equal chance of selection, thereby enhancing the validity and generalizability of the results. Data collection was conducted using a researcher-designed questionnaire, which was divided into six sections: Section A captured personal information, while Sections B through F addressed the core research



questions. Descriptive statistical methods, such as frequency counts and simple percentage means, were employed to analyze the data, given their clarity and ease of interpretation.

Results

Questionnaire Response Rate

Table 1: Questionnaire Response Rate

Copies of the Questionnaire Administered	Copies of the Questionnaire Returned	Percentage
348	322	95.4%

A total of 348 copies of the questionnaire were distributed and 332 (95.4%) copies of them were completely filled and useful for conducting the study. The response rate of 95.4% is considered adequate for the study because the standard and acceptable response rate for most studies including humanities, social and management sciences, health sciences and particularly education is 60% and above (Fincham, 2008; Choi, 2016; Kubai, 2019).

Sex of the Respondents

Table 2: Sex of the Respondents

Copies of the Questionnaire	Copies of the	Percentage
Female	154	46.4
Male	178	55.6
Total	332	100.0

As revealed in Table 2, there are 152 (46.4%) female respondents and 178 (55.6%) male respondents in this study. This implies that there were more female 178 (55.6%) respondents than their male counterparts in this study.

Research Question One: What digital tools and technologies enhance students' learning experiences?

Table 4.3: Digital Tools and Technologies Enhance Students' Learning Experiences

Digital Tools and Technology	SA	A	D	SD	$\bar{X}$
Learning Management System (LMS)	132	165	23	12	3.26
Collaborative Tools	138	156	24	14	3.26
Interactive Learning Platforms	154	150	10	18	3.33
Multimedia and Content Creation Tools	134	161	21	16	3.24
Educational Apps	136	161	18	17	3.25
Virtual and Augmental Reality (VR/AR)	147	161	17	7	3.35
Online Assessment Tools	144	142	33	13	3.26
Gamification Platforms	150	151	16	15	3.31
Digital Libraries and Resources	143	163	14	12	3.32
Artificial Intelligence (AI) Tools	173	132	21	6	3.42
Average Mean					3.30
Criterion mean					2.50

Data from Table 4.3 shows an average mean of 3.30, exceeding the criterion mean of 2.50, indicating that digital tools significantly enhance students' learning experiences. The



most effective tools are AI tools ($\bar{X} = 3.42$), VR/AR ($\bar{X} = 3.35$), interactive learning platforms ($\bar{X} = 3.33$), and digital libraries ($\bar{X} = 3.32$). Other impactful tools include gamification platforms ($\bar{X} = 3.31$), online assessment tools ($\bar{X} = 3.26$), LMS ($\bar{X} = 3.26$), collaborative tools ($\bar{X} = 3.26$), educational apps ($\bar{X} = 3.25$), and multimedia tools ($\bar{X} = 3.24$).

Research Question Two: What role digital tools and technologies play in enhancing students' learning experiences?

Table 4.4: Role Digital Tools and Technologies Play Experiences in Enhancing Students' Learning

Role do Digital Tools and Technologies Play	SA	A	D	SD	$\bar{X}$
Promote collaboration and communication	182	138	4	8	3.49
Enhance student engagement	177	135	16	4	3.46
Enable simulations and virtual experiences	155	167	4	6	3.42
Encourage lifelong learning	173	134	10	15	3.40
Facilitate formative assessment	166	140	15	11	3.39
Facilitate personalized learning	160	143	18	11	3.36
Provide access to diverse resources	154	153	15	10	3.36
Cultivate digital literacy skills	158	145	18	11	3.36
Offer immediate feedback	151	148	23	10	3.33
Crate flexible learning environments	141	160	22	9	3.30
Average Mean					3.39
Criterion mean					2.50

The data in Table 4.4, with an average mean of 3.39, exceeding the criterion mean of 2.50, demonstrates the significant role of digital tools in enhancing students' learning. Prominent contributions include promoting collaboration and communication ($\bar{X} = 3.49$), enhancing engagement ($\bar{X} = 3.46$), and enabling simulations ($\bar{X} = 3.42$). These tools also encourage lifelong learning ($\bar{X} = 3.40$), support formative assessments ($\bar{X} = 3.39$), and facilitate personalized learning, access to resources, and digital literacy (all $\bar{X} = 3.36$), providing immediate feedback ($\bar{X} = 3.33$).



Research Question Three: How do students perceive the Impact of Digital Tools and Technology in fostering resilience for future challenges and uncertainties?

Table 4.5: Impact of Digital Tools and Technology

Impact of Digital Tools and Technology	SA	A	D	SD	$\bar{X}$
Students perceive digital tools as vital in developing critical thinking and problem-solving abilities	211	112	6	3	3.60
Students perceive digital tools as essential for building skills necessary for the future	188	123	14	7	3.48
Students recognize digital tools as key in fostering teamwork and global communication	172	144	10	6	3.45
Digital technologies allow students to explore a wider range of information and knowledge	173	139	15	5	3.45
Exposure to technology helps students become more adaptable to change and future challenges	183	123	13	13	3.43
Digital tools offer simulated environments, preparing students for future challenges	169	133	21	9	3.39
Students appreciate immediate feedback, which helps them improve and stay resilient	160	143	18	11	3.36
Online tools enable learning at their own pace, enhancing adaptability	158	145	18	11	3.36
Students see technology as empowering them to take control of their learning process	155	147	21	9	3.35
Technology promotes lifelong learning, fostering resilience for future uncertainties	141	160	22	9	3.30
Average Mean					3.42
Criterion mean					2.50

Table 4.5 reveals an average mean of 3.42, indicating that students perceive digital tools as integral to fostering resilience for future challenges. The most significant finding highlights that these tools develop critical thinking and problem-solving skills ($\bar{X}$ = 3.60) and are essential for building future competencies ($\bar{X}$ = 3.48). Additionally, digital tools promote teamwork and global communication ($\bar{X}$ = 3.45) while facilitating access to diverse knowledge ($\bar{X}$ = 3.45). Students also recognize their role in enhancing adaptability to change ($\bar{X}$ = 3.43), providing immediate feedback ($\bar{X}$ = 3.36), and empowering self-directed learning ($\bar{X}$ = 3.35), ultimately fostering lifelong learning ($\bar{X}$ = 3.30).



Research Question Four: To what extent are students exposed to digital tools that prepare them for future challenges?

Table 4.6: Extent of students exposed to digital tools that prepare them for future challenges

Challenges Students Face	SA	A	D	SD	$\bar{X}$
Learning Management System (LMS)	28	18	56	230	1.53
Collaborative Tools	18	22	67	225	1.50
Interactive Learning Platforms	19	25	58	230	1.50
Multimedia and Content Creation Tools	26	24	39	243	1.50
Educational Apps	23	13	64	232	1.48
Virtual and Augmental Reality (VR/AR)	21	21	52	238	1.47
Online Assessment Tools	20	19	39	254	1.41
Gamification Platforms	11	21	58	242	1.40
Digital Libraries and Resources	16	17	49	250	1.39
Artificial Intelligence (AI) Tools	28	18	56	230	1.53
Average Mean					1.47
Criterion mean					2.50

Table 4.6 reveals that students are inadequately exposed to digital tools essential for preparing them for future challenges, with an average mean of 1.47, significantly below the criterion mean of 2.50. Learning Management Systems (LMS) and Artificial Intelligence (AI) tools lead with means of 1.53, indicating minimal familiarity. Collaborative Tools, Interactive Learning Platforms, and Multimedia Content Creation Tools each score 1.50, reflecting limited engagement. Furthermore, Online Assessment Tools ($\bar{X} = 1.41$), Gamification Platforms ($\bar{X} = 1.40$), and Digital Libraries ($\bar{X} = 1.39$) show even lower exposure. These results underscore an urgent need for improved access and integration of digital tools in educational environments.

Research Question Five: What challenges do students face in accessing and using digital tools?

Table 4.7: Challenges Students Face in Accessing and Using Digital Tools

Challenges Students Face	SA	A	D	SD	$\bar{X}$
Inconsistent or insufficient guidance from instructors	143	146	24	19	3.22
Technical skill gaps	155	145	28	4	3.24
Lack of reliable electricity for charging devices	165	153	6	8	3.57
Inadequate training on digital tools	159	135	27	11	3.25
Distractions from multitasking	167	138	10	17	3.41
Data privacy and security concerns	167	135	19	11	3.40
Accessibility issues for students with disabilities	155	143	23	11	3.21
High cost of technology and internet access	177	143	4	8	3.62
Overwhelming choices of tools and platforms	160	134	27	11	3.24
Reliability and technical issues with digital tools	153	156	10	13	3.35
Average Mean					3.35
Criterion mean					2.50

Table 4.7 reveals critical challenges students encounter in accessing and utilizing digital tools, with an average mean of 3.35, significantly above the criterion mean of 2.50.



The highest concern is the high cost of technology and internet access ($\bar{X}$ = 3.62), followed by lack of reliable electricity for charging devices ($\bar{X}$ = 3.57), other notable challenges include distractions from multitasking ($\bar{X}$ = 3.41) and data privacy and security concerns ($\bar{X}$ = 3.40). Furthermore, students reported issues related to inconsistent guidance from instructors ($\bar{X}$ = 3.22) and inadequate training on digital tools ($\bar{X}$ = 3.25). These findings highlight the need for comprehensive support systems to enhance digital tool accessibility.

Discussions

The findings from table one demonstrates that digital tools significantly enhance student & learning experiences. Core technologies such as Learning Management Systems (LMS), collaborative platforms, interactive content creation tools, multimedia applications, Virtual and Augmented Reality (VRJAR), online assessment systems, gamified learning platforms, digital libraries, and Artificial Intelligence (AI) tools are pivotal in this improvement. Shaikh (2024) supports this assertion, noting that the integration of digital tools in education cultivates deeper engagement and fosters student collaboration. In a similar vein, Kalu and Imo (2023) underscore the impact of technologies like LMS and multimedia resources in elevating academic outcomes and learning experiences within the Nigerian educational landscape.

From table two, the research highlights the substantial influence of digital tools on promoting student collaboration, communication, and engagement while enabling simulations that enhance learning. These tools not only facilitate lifelong learning but also support formative assessments and personalized educational experiences, providing learners with immediate access to resources, fostering digital literacy, and delivering real-time feedback. Furthermore, the research also highlights students perceive digital tools as essential for cultivating resilience in the face of future challenges. These technologies strengthen critical thinking and problem-solving skills, competencies that are crucial for future success. Additionally, table four reveals that digital tools enhance teamwork, promote global communication, and grant access to diverse knowledge bases. By aiding adaptability to change and supporting self-directed learning, these tools ultimately promote lifelong learning. Research within world echoes these findings. Udvaros, Gubán, and Gubán (2019) found that incorporating digital technologies into classroom instruction significantly improves student engagement, motivation, and collaborative learning, thereby fostering critical thinking and problem-solving abilities. Similarly, Haleem et al. (2022) noted that digital tools enhance students' adaptability and self-directed learning, both of which are essential for developing lifelong learning skills. Their study revealed that students who engaged with digital resources exhibited better academic performance and greater resilience in navigating future challenges.

However, from table five reveals that students face inadequate exposure to the digital tools necessary for preparing them for future uncertainties. Significant barriers include insufficient guidance from instructors, gaps in technical proficiency, and unreliable electricity for charging devices. Students also experience challenges such as a lack of training on digital tools, distractions from multitasking, data privacy and security concerns, accessibility issues for disabled students, high technology and internet costs, an overwhelming array of tools and platforms, and technical reliability issues. These findings align with those of Haleem et al. (2022), who identified insufficient training and technical skills as major obstacles to effective digital tool usage. Their research emphasized that the absence of proper instructor guidance limits students' ability to fully leverage digital technologies. Similarly, Dinim (2018) pointed to unreliable electricity, high technology costs, and data privacy concerns as additional



factors complicating students' access to digital tools, ultimately impeding academic performance and preparedness for future digital environments.

Conclusion

In conclusion findings of this research highlight the pivotal role that digital tools and technologies play in enriching the educational experiences of university students. While a considerable proportion of students recognize the value of digitalization in promoting personalized learning, increased engagement, and building resilience, there remains a significant gap in their access to and familiarity with these resources. Barriers such as insufficient instructor guidance, deficits in technical proficiency, and accessibility limitations impede students from fully harnessing the potential of digital tools to enhance their academic performance. To foster a more resilient and future-ready student body, educational institutions must prioritize the development of comprehensive training initiatives, robust technological infrastructures, and continuous support mechanisms. By effectively addressing these challenges, educators can equip students with the skills to navigate the complexities of the digital era, thereby enriching their educational journey and fortifying their capacity to face future uncertainties with assurance. A well-executed strategy for integrating digitalization within education can thus play a crucial role in shaping a generation of adaptable and capable learners.

Recommendations

1. Educational institutions should develop and implement robust digital literacy initiatives, encompassing workshops and tutorials tailored for both students and faculty, to ensure proficient and effective utilization of digital resources.
2. Faculty members are encouraged to establish structured mentorship programs, incorporating regular office hours and interactive discussion forums, to guide students in navigating digital tools and to foster an environment conducive to collaboration.
3. University administrations must prioritize upgrading technological infrastructure, including the enhancement of campus-wide Wi-Fi networks, provision of charging stations, and facilitation of device access through loan schemes or financial subsidies.
4. Government agencies should introduce initiatives aimed at subsidizing technology expenses for students from low-income backgrounds, offering grants and funding opportunities to mitigate financial barriers and promote equal access to educational technologies.
5. Students should actively engage in online courses, workshops, and peer-supported learning platforms, while utilizing educational applications to enhance their digital competencies and strengthen resilience in a rapidly evolving academic landscape.



References

- Adreisk will, N. O, Omolola, S. A, Mosaau, A. O, & Adebola, M. S, (2022). Empirical study on electronic learning system benefits, challenges and prospects. *International journal of science education and cultural studies*, 1(2), 109-119
- Chhaya, A. K., & Sarode, R. D. (2017). Advantages & challenges for using digital technologies in the classroom. Technical Research Paper Competition for Students (TRPCS-2K17), G. H. Raison College of Engineering and Management, Amravati, Maharashtra, India. *International Journal of Science and Research (IJSR)*, 7(6), 1–4
- Dancsa, D., tempel'ová, I., Taká, O., & Annu, N. (2023). Digital tools in education. *International Journal of Advanced Natural Sciences and Engineering Researches*, 7(4), 289—294.
- Dinim, N. (2018). 7 roles of educational technology in Nigerian university education. Infoguide Nigeria. <https://infoguidenigeria.com!educationaltechnology-nigeria/>
- Dreimane, S., & Upenieks, R. (2022). Intersection of serious games and learning motivation for medical education: A literature review, In *Research anthology on developments in gamification and game-based learning* (pp. 1938—1947).
- Haleem, A., Javaid, M., Qadri, A. M., & Suman, R. (2022). Understanding the role of digital technologies in education: A review, *Sustainable Operations and Computers*, 3, 275-285.
- Haleem, B., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education: A review. KeAi Chinese Global impact Publication. <http://www.keaipublishing.com/en/journals/sustainable-operations-and-computers/>
- Kalu, P. I., & Imo, O. E. (2023). Impact of digital tools in the teaching and learning of creative design in the University of Nigeria, Nsukka. Unpublished project.
- Nazirul, I. Sarker, M. W., Qian, C., Monirul, A., & Dan, L. (2019). Leveraging digital technology for better learning and education: A systematic literature review. *International Journal of Information and Education Technology*, 9(7), 1-19.
- Okokoyo, E. I., Emiko-Agbajor, T. H., Chenube, O., & Oji, J. (2023). Awareness, knowledge, and utilisation of online digital tools for literature review in educational research. *Heliyon*, 9(1).
- Ordov, K., Madiyarova, A., Ermilov, V., Tovma, N., & Murzagulova, M. (2019). New trends in education as the aspect of digital technologies. *International Journal of Mechanical Engineering and Technology*, 10(2), 1319-1330.
- Shaikh, I. R. (2024). The role of digital technologies in education: Benefits and challenges. *International Research Journal on Advanced Engineering and Management*, 2(6), 2029—2037.
- Tenya, A., Mama, J., & Awuor, F. (2023). Challenges in accessing and utilizing information in digital resource platforms by academic staff in selected public universities in Kenya. *International Journal of Current Aspects*, 7(2), 65-80.



- Udvaros, 3., Gubán, A., & Gubán, M. (2019). Methods of artificial intelligence in economical and logistical education. e-Learning and Software for Education Conference, 414-421.
- Wang, K., Li, B., Tian, T., Zakuan, N., & Rani, P. (2023). Evaluate the drivers for digital transformation in higher education institutions in the era of industry 4.0 based on decision- making method.; *Journal of Innovation & Knowledge*, 8(3).