


# Regression Analysis of Students' Perception on Internet-based Teaching-learning Effectiveness in Nursing Institutions of North-central, Nigeria

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## Abstract

**Background:** The academic performance of nursing students in Nigeria has been hindered by ineffective teaching strategies, largely due to limited integration of innovative approaches in the teaching-learning process. **Aim:** This study investigated the regression analysis of nursing students perceive effectiveness of internet-based teaching-learning strategies on the teaching-learning process in North-central Nigeria. **Method:** A cross-sectional quantitative research design was adopted to assess the effectiveness of Internet-based teaching-learning strategies among nursing students across three institutions in North-central Nigeria. A total of 400 students were proportionately selected from a population of 1,267. Data were collected using a structured questionnaire, and analyzed using descriptive statistics and regression analysis to determine the relationship between Internet-based teaching-learning strategies and students' academic performance. **Results:** Results showed that 73.5% of students testified that Internet-based teaching-learning strategies, with 79.5% indicating that these innovations made learning easier. Additionally, 73.3% of students believed that Internet-based teaching-learning strategies improved their overall academic performance. Significant proportion of students perceived mobile teaching-learning (69.8%), online game-based learning (72.5%), artificial intelligence (73.5%), and digital content platforms as effective tools for facilitating teaching-learning activities. **Conclusion:** This study concludes that regression coefficients for the entire four internet-based strategies are found to be significant with all the p-values < 0.05. This implies that there is a significant linear relationship in the effective use of internet-based teaching-learning and the academic performance of the students. Based on these findings, this study recommends that internet-based teaching-learning strategies should be prioritized to complement the traditional teaching approaches in nursing education. The necessary internet and technological facilities should be provided to support high-quality education.

**Keywords:** Internet-based teaching-learning strategies, AI., Digital content learning platform, Gamification learning, Online learning.



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## Introduction

The evolution of web-based information platforms and social media has made the internet the primary source of educational information for most educators and students. The internet has become a widely used technology for both teaching and learning innovation strategies in various educational institutions, across African countries particularly in Nigeria. The internet services have been a game-changer for academics in Nigerian tertiary institutions, with Information Communication Technology revolution sweeping globally, Nigeria is also caught in the wave of ICT use. Ghavifekr, and Anthony (2016), identified three major reasons for ICT use in education which are: As a tool for addressing challenges in teaching and learning situations, especially in learning delivery, management, and support. And as a change agent for the content, methods, and overall quality and quantity of teaching and learning; thereby reducing teachers' workload and ensuring constructivist inquiry-oriented classroom. The increasing availability of internet technology devices or portable digital-aided devices has continued to change the teaching-learning landscape, including technology-supported learning. The availability of internet technology devices has made the usage of portable digital assistants and technology an integral part of teaching and learning nowadays in Nigeria. Cloud computing, which includes YouTube, Google Apps, Dropbox, and Twitter, has become the reality of today's teaching and learning has noticeably improved learning in higher education, including nursing education (Mahlasela, 2022).

The introduction of new educational pedagogies in the modern educational system is increasingly in demand to offer teachers and learners' opportunities to develop essential learning tools needed for learners' skills, such as critical thinking, problem-solving, and effective communication. The integration of educational innovations has revolutionized the education system, introducing online learning platforms and diverse teaching methodologies that enhance the learning experience (Al-Ansi, et al 2023). The adoption of internet-based teaching and learning strategies amongst students and educators has become a major source of information, using laptops, smartphones, and tablets in class to instantly access relevant information on various aspects of academic topics.

In nursing education, mobile learning has emerged as a promising tool to enhance teachers' knowledge, skills, and pedagogical practices (Almaiah et al., 2019). However, despite these potentials of internet-based learning and other educational innovations, Nigeria still faces disparity of internet-based provisions in the communities. There is a significant digital divide between

urban and rural areas, with about 27 million Nigerians lacking access to telecommunication infrastructure. Even within institutions, access varies, with some colleges lacking on-campus ICT facilities altogether (Damilola 2025, Ogbonna et al. 2025).

The slow internet speed and unstable connections are major issues, hindering effective use of online resources. Unreliable electricity and inadequate funding exacerbate these problems. Affordability is a significant barrier, with the median price of an entry-level mobile broadband plan (2GB per month) at 4.2% of the gross national income (GNI) per capita, exceeding the UN Broadband Commission's affordability target of 2%. Varying technological skills among students and staff hinder meaningful use of ICTs. Scaling digital literacy training is crucial to bridge this gap. Security concerns like hacking and phishing are real threats, requiring robust measures to protect users (Damilola, 2025).

Omotayo and Fadehan (2008), observed that a high percentage of Nigerian students still access both the computer and the Internet, mainly at the cyber-cafes and in their offices. The use the Internet for communication among teachers and students in many schools in Nigeria for academic purposes to aid them in their studies and research. However, in this quest, they encounter problems such as lack of basic infrastructure and a maintenance culture, slowness of the Internet and lack of technical know-how. The adoption of these internet facilities remains limited in North-central Nigerian nursing institutions, particularly in Kwara State. This study aims to bridge the gap between developed and developing nations in the education sector by investigating the regression analysis on perceptions of nursing students about innovative teaching strategies and their impact on the teaching-learning process in North-central Nigeria. Exploring the impact relationship between innovations like mobile learning, online game-based learning, artificial intelligence, and digital content platforms, this research will seek to inform strategies for enhancing nursing education in Nigeria.

The following Research Questions were answered:

1. **RQ1.** What is the preferred internet-based teaching-learning strategies used among students of nursing institutions in Kwara State
2. **RQ2.** Which of the internet-based teaching-learning strategies is perceived to be more effective on the academic performance of students in nursing institutions of Kwara State
3. **RQ3.** What is the relationship between the perceived effectiveness of internet-based teaching-learning strategies and the learning ability of students in nursing institutions of Kwara State.

## Methods

This study employs a cross-sectional research design to assess the Regression Analysis of the effectiveness of Internet-based Teaching-Learning strategies used in Nursing Institutions across the North-central State of Nigeria. The population for this study comprised 2,466 student nurses in the nursing institutions of Kwara State; Department of Nursing, Al-Hikmah University, Ilorin-362, Department of Nursing Sciences, University of Ilorin-512, Department of Nursing, Thomas Adewumi University, Oko-315, Kwara State College of Nursing Sciences, Ilorin-541, Kwara State College of Nursing Sciences, Oke-ode-521 and University of Ilorin Teaching Hospital College of Nursing, Ilorin-205 respectively. Three nursing institutions were purposively selected from the 6 nursing institutions in Kwara State. The consideration in choosing the institutions was based on the geographical spread of the institutions across the state for equal representation of the three senatorial districts across the state. The study population (males and females) was proportionately sampled base on the population distributions of institutions; Kwara State College of Nursing Sciences Ilorin (SONI); 541(43.1%), Oke-Ode, College of Nursing Sciences, (OCON); 521(41.0%), and University of Ilorin Teaching Hospital, College of Nursing Sciences (UITH.CONNS); 205(16.0%), Ilorin with a total population of 1,267 across the 3 selected institutions across the state for this study. However, the total study population of 400 student nurses and midwives was proportionately sampled from the target population, thus in Kwara Central, 171 from KWCONS, Ilorin, Kwara-South-164 from OCONS, and 65 from UITHCON, from Kwara-north, for this study guided by Slovin's formula for sample size determination.

The instrument for data collection was a semi-structured questionnaire divided into five sections based on the study objectives. Section A: the preference for Internet-based teaching-learning strategies used among students of nursing institutions in Kwara State, Section B: the students' most perceived effectiveness of teaching-learning strategies used to enhance students' academic performance in nursing institutions of Kwara State. while Section C: Observe the relationship between the perceived effectiveness of specific internet-based educational technologies innovations used and the learning ability of students in nursing institutions of Kwara State. The instrument's content validity was ascertained based on the content of the questionnaire, which was designed to incorporate variables from the research objectives. The instrument's reliability was assessed using the test-retest reliability method to evaluate its consistency. That is, 30 questionnaires were

administered to students in 2 selected nursing institutions similar in characteristics to the study institutions. The data collected was then analyzed, given a test-retest reliability index of 0.78%.

The ethical approval for this study was obtained from the Ministry for Tertiary Education, Kwara State, which oversees the affairs of all tertiary institutions in the state. The approval for the conduct of this study was granted, by the authorities of the 3 study institutions. The students were assembled in their respective school Halls, the purpose of the study was explained, and they were assured of the confidentiality of information to be provided. Student-informed consent was sought before the administration and subsequent retrieval of the questionnaires.

The data was analyzed based on the study objective and hypothesis using descriptive and inferential statistics (simple regression analysis). The descriptive statistics were used to summarize nursing students' awareness of new technological innovations in teaching-learning, perceived academic performance of students in using new educational technology innovations for teaching-learning, perceived effectiveness of various new online teaching-learning technologies, mobile learning, online game-based learning, artificial intelligence learning, and digital content platform learning among nursing students. The analysis was based on the responses from students on each item, and each item was compared by its mean score.

The study adopted the Padagas and Hajan (2020) comparison scoring mode of 5-point Likert scale type showing the mean scores of the respondents based on performance and perception about innovation in teaching and learning processes in the nursing institutions with scoring mode of < 1.79 as poor or Not effective, 1.80-2.59 as Need Improvement or Slightly effective, 2.60-3.39 as Satisfactory or Moderately effective, 3.40-4.19 as Highly Satisfactory or Effective, and >4.20 as Excellent or Very effective respectively. The inferential analysis of correlation analysis was used to determine the statistical relationship between the effectiveness of the new educational technological innovations on the students' academic performance at  $\alpha = 0.05$  level of significance.

## Results

This study on regression analysis of the effectiveness of Internet-based Teaching-Learning strategies used in Nursing Institutions across Kwara state (North-central State, Nigeria) among 400 sampled students revealed the mean age of 20.5, and sex distribution, showing more than two-thirds (70.5%) were female, constituting the majority. who were in their early stage of adolescence.

Table 1 reveals that over two-thirds of students were familiar with the use of internet-based teaching and learning technological innovations, and 74% prefer using AI and Digital content compared to others in their institutions. About 57.0% of students find the Internet-

based innovations strategies easy to use, as 20% found it challenging to use. Furthermore, 63.3% of them claimed that new technological innovations enhance their understanding and boost their academic performance in their institutions.

**Table 1** The preference for Internet-based teaching-learning strategies used among students of nursing institutions in Kwara State (n=400)

S/N	Items	Some time	Most times	No
1.	Do you use internet-based teaching-learning technologies in your institutions?	109 (27.3%)	211(52.8%)	80 (20.0%)
2.	Which of the following internet-based teaching-learning technologies do you prefer for teaching-learning in your institution?			
	a. Mobile Learning	117 (29.3%)	279 (69.8%)	4 (1.0%)
	b. Online Game-Based Learning students.	105 (26.5)	288 (72.0%)	6 (1.5%)
	c. Artificial Intelligence	103 (25.8%)	294 (73.5%)	3(0.8%)
	d. Digital Content Platform Learning	102 (25.5%)	294 (73.5%)	4(1.0%)
3.	Are those new technological innovations easy to use in teaching and learning in your institution?	90 (22.5%)	228(57.0%)	82 (20.5%)
4.	Do you understand more about new technological innovations in the teaching-learning process?	80 (20.0%)	204(51.0%)	116 (29.0%)
5.	Do the new technological innovations increase your educational performance?	40 (10.0%)	253(63.3%)	107 (26.8%)

Table 2 revealed student perceptions about Mobile Teaching and Learning in Nursing Education with 4.6% (mean score) believe that mobile teaching and learning significantly enhances their nursing learning abilities. A high value of 69.3% of students agree that mobile teaching and learning is highly valuable, as 70.0% reported that mobile learning motivates them to attend classes and facilitates their class work, and enhancing their ability to learn new concepts. While on the ease of use of

mobile learning, Students affirm (mean score 4.68) that mobile teaching and learning is easy to use. Although, 75.5% of students acknowledged challenges faced, primarily due to poor internet and erratic electricity supply. These results implied that mobile teaching and learning can be a valuable tool in nursing education, that motivation students learning abilities, and enhance classroom activities.

**Table 2** Perceived Effect of Mobile Learning on Nursing Students (n=400)

Items	SD	D	UD	A	SA	Mean
Mobile teaching-learning is a useful tool for teaching and learning in nursing institutions.	-	-	3 (0.8%)	120 (30.0%)	277 (69.3%)	4.68
Mobile teaching-learning has motivated students to attend classes in nursing institutions.	-	-	8 (2.0%)	118 (29.5%)	274 (68.5%)	4.67
The use of Mobile teaching-learning for students' classwork assisted nursing students to learn new things.	-	-	4 (1.0%)	117 (29.3%)	279 (69.8%)	4.69
Using Mobile learning for teaching and learning has increased nursing students' learning ability.	-	-	3 (0.8%)	120 (30.0%)	277 (69.3%)	4.68
Mobile teaching-learning is an innovation that is easy to use for teaching and learning nursing students.	-	-	3 (0.8%)	123 (30.8%)	274 (68.5%)	4.68
Mobile teaching-learning innovations have challenges.	-	-	1 (0.3%)	97 (24.3%)	302 (75.5%)	4.75
<b>Total Mean Scores</b>						<b>4.69</b>

Table 3 shows that about 73.0% of students reported that online game-based learning is an effective tool for teaching and learning in nursing institutions. Similarly, 68.0% believe this mode of learning motivates them to attend classes, as 70.0% of them supported that online game-based learning helps in learning new concepts, and 69.0% affirmed it is an easily adoptable innovation in teaching and learning, which enhances

their learning abilities. Although few claimed it has challenges of usage. The overall mean score of 4.69 indicates that even though online game-based teaching-learning methods are very effective in improving their learning abilities, the innovation was also not devoid of operational challenges.

**Table 3** Perceived Effect of Online Game-Based Learning on Nursing Students (n=400).

Items	SD	D	UD	A	SA	Mean
Online game-based learning is a useful tool for teaching and learning in nursing institutions.	-	-	8 (2.0%)	102 (25.5%)	290 (72.5%)	4.71
Online game-based learning has motivated students to attend classes in nursing institutions.	-	-	11 (2.8%)	119 (29.8%)	270 (67.5%)	4.65
The use of Online game-based learning for students' classwork assisted nursing students to learn new things.	-	-	11 (2.8%)	109 (27.3%)	280 (70.0%)	4.67
Using Online game-based learning for teaching and learning has increased nursing students' learning ability.	-	-	11 (2.8%)	115 (28.7%)	274 (68.5%)	4.66
Online game-based learning is an innovation in teaching and learning that is easy to adopt in the teaching of nursing students.	00.0%	00.0%	6 (1.5%)	105 (26.5%)	288 (72.0%)	4.71
Online game-based teaching-learning innovations have challenges.	00.0%	00.0%	00.0%	107 (26.8%)	293 (73.3%)	4.73
<b>Total Mean Scores</b>						<b>4.69</b>

Table 4 shows that nearly all students with a mean score of 4.71 believe AI learning is a useful tool, as a similar percentage claimed it motivates them to attend classes and learn new concepts. Most students with a mean score of 4.73 affirmed that AI learning enhances

learning abilities and is an easily adoptable innovation in learning. However, almost all students with a mean score of 4.80, opined that despite the advantage of the introduction of AI into teaching and learning, it also has challenges for its effective learning processes.

**Table 4** Perceived Effect of Artificial Intelligence learning on Nursing Students (n=400).

Items	SD	D	UD	A	SA	Mean
Artificial intelligence learning is a useful tool for teaching and learning in nursing institutions.	-	-	2 (0.5%)	112 (28.0%)	286 (71.5%)	4.71
Artificial intelligence learning has motivated students to attend classes in nursing institutions.	-	-	2 (0.5%)	128 (32.0%)	270 (67.5%)	4.67
The use of Artificial intelligence learning for students' classwork assisted nursing students to learn new things.	-	-	2 (0.5%)	110 (27.5%)	288 (72.0%)	4.72
Using Artificial intelligence learning for teaching and learning has increased nursing students' learning ability.	-	-	3 (0.8%)	103 (25.8%)	294 (73.5%)	4.73
Artificial intelligence learning is an innovation in teaching-learning that is easy to adopt in the teaching of nursing students.	-	-	3 (0.8%)	103 (25.8%)	294 (73.5%)	4.73
Artificial Intelligence teaching-learning innovations have challenges.	-	-	-	80 (20.0%)	320 (80.0%)	4.80
<b>Total Mean scores</b>						<b>4.73</b>

Table 5 reveals the overall mean score of 4.74, indicating students' opinion about the significance of digital content platforms to teaching and learning. Almost 97.0% prefer using digital content platforms, as a similar percentage confirms AI effectiveness in teaching and

learning. Some express that it motivates them to learn new concepts and increases their learning ability however, similar percentage of students acknowledged the challenges associated with it use.

**Table 5** Perceived Effect of Digital Content Platform Learning on Nursing Students (n=400).

Items	SD	D	UD	A	SA	Mean
Digital content platform learning is a useful tool for teaching and learning in nursing institutions.	-	-	1 (0.3%)	101 (25.0%)	298 (71.5%)	4.74
Digital content platform learning has motivated students to attend classes in nursing institutions.	-	-	5 (1.3%)	106 (26.5%)	289 (72.3%)	4.71
The use of a Digital content platform learning for students' classwork assisted nursing students to learn new things.	-	-	4 (1.0%)	102 (25.5%)	294 (73.5%)	4.72
Using a Digital content platform learning for teaching-learning has increased nursing students' learning ability.	-	-	3 (0.8%)	103 (25.8%)	294 (73.5%)	4.73
Digital content platform learning is an innovation in teaching-learning that is easy to adopt in the teaching of nursing students.	-	-	3 (0.8%)	103 (25.8%)	294 (73.5%)	4.72
Digital content platform teaching-learning innovations have challenges.	-	-	-	84 (21.0%)	316 (79.0%)	4.79
<b>Total Mean scores</b>						<b>4.74</b>

Table 6 reveals that out four internet-based teaching and learning innovations, (mobile teaching/learning, online game-based learning, Artificial intelligence learning, and digital content platform learning), there was a moderate significant impact on the academic performance of

nursing students with  $R^2 = 0.598, 0.462, 0.440, 0.455$  with p-values less than 0.05, implies that there is a significant linear relationship between various internet-based teaching learning strategies and students' academic performance.

**Table 6** Results of the Regression Analysis of various internet-based teaching/learning strategies on Academic performances.

Coefficients	Estimate	Std. Error	t-value	R <sup>2</sup>	p-value
(Constant)	0.716	0.164	4.376		0.000
Mobile Teaching-Learning.	0.846	0.035	24.340	0.598	0.000
(Constant)	1.539	0.171	9.015		0.000
Online Game-based Learning.	0.671	0.036	18.493	0.462	0.000
(Constant)	1.174	0.199	5.895		0.000
Artificial Intelligence Learning.	0.743	0.042	17.681	0.440	0.000
(Constant)	1.126	0.196	5.754		0.000
Digital Content Platform Learning	0.751	0.041	18.231	0.455	0.000

**Discussion**

This study investigated the regression analysis of students' perceived effectiveness of internet-based teaching and learning strategies on students in nursing institutions of Kwara state, North-central Nigeria. The study revealed that students' mean age was 20.5, with their sex distribution showing 70.5% female, constituting the

majority in this study. The age and sex of the students in this study implied that students are in their early stage of adolescence, and females constituted the majority, showing a unique dominance of females in the Nursing profession against males opposite sex. The mean age of the students in this study conformed to the average age of students in a survey by Chinaza (2021). Although the age may vary, as some students' entry point to nursing

institution was 18 years, and some joined nursing education at 25 years of age as a form of continuing education. At this age and gender distribution, it suggests that the students are predominantly young adults in the early stages of their professional development.

**RQ1.** What is the preferred internet-based teaching-learning strategies used among students of nursing institutions in Kwara State?

In this study, students' highlights' various strategies such as Mobile Learning, Digital Content Platforms, AI learning and game-based learning. They acknowledged that all internet-based educational tools have significant impact on their learning process. However, students preferred AI and Digital Content as their favorites for ease of use. Students' views on AI learning use were the highest with a mean score of 4.71, viewed as a useful tool which motivates them for attending classes and learning new concepts. AI learning boosts learning abilities (mean score: 4.73) and is easy to adopt. However, students (mean score: 4.80) highlight challenges which amper the effective use of AI for learning. Recent studies support these current findings that AI learning enhances nursing students' performance ( $\beta = 0.743$ ,  $p < 0.05$ ) (Barthel et al; 2025). Another study also aligned with this study that AI educational internet-based educational innovation impact on learning abilities is significant in nursing education (Alshammari et al; 2025).

The online Game-Based Learning was also considered to be engaging, but slightly less impactful than mobile learning. These strategies are making waves in nursing education, enhancing academic performance. A study showed a significant linear relationship between these innovations and students' performance, with mobile learning leading the pack ( $R^2 = 0.598$ ). This finding was similar to study by Chikaodinaka, et al. (2023), regarding students and nurses, 87.3% preferred all the teaching methods used by the lecturers in the selected institutions in south east Nigeria, but the most appreciated was team based learning (95.4%).

**RQ2.** Which of the internet-based teaching-learning strategies are perceived to be more effective on the academic performance of students in nursing institutions of Kwara State

Students' views on mobile teaching and learning in nursing education show promise. A mean score of 4.6 indicates it boosts their learning abilities. About 69.3% see it as highly valuable, and 70% say it motivates them to attend classes and learn new concepts. With a mean score of 4.68, students find mobile learning easy to use. However, 75.5% face challenges like poor internet and

erratic power supply. Overall, mobile learning was viewed as a useful tool for nursing education, enhancing, and motivation in classroom activities. Samar et al (2025) supported this finding that students use mobile applications for their learning process which shows a positive correlation between students' self-efficacy and the usability of mobile learning applications ( $r = .741$ ), which implied that there were significant relationships between the students' usability of utilizing mobile applications and their self-efficacy ( $p < 0.05$ ).

Furthermore, students showed enthusiasm for AI learning- usefulness above other (4.71 mean score) internet-based teaching-learning strategies used and opined that AI was a valuable internet-based learning that motivated (Score: 4.67) them to engaged in classes and new concepts, enhanced Learning and boosts their learning abilities as it is easy to adopt. Although AI was rated the highest (score:4.80) but students acknowledge AI has challenges in effective learning. This in the study implies that despite the students love for AI as learning technological tool they recognize its challenges. These according to a mini-review by Ghani, et al (2025) highlights a variety of innovative learning techniques being implemented in African medical schools, suggests that these methods positively influence student learning outcomes, but David, et al (2025) argued that Despite the average knowledge of nursing students about AI, 85.5 % were willing to take AI training, and 92.6 % believed AI could enhance healthcare workflow. However, concerns regarding inadequate infrastructure (43.5 %) and privacy issues (37.1 %) were prevalent.

On the students' perception of the effect of new educational innovations on teaching-learning in the students' institutions, this study has demonstrated that quite a large number of students opined affirmatively that internet-based teaching-learning strategies have significantly improved teaching-learning in their institutions, as 70.0% of them believed that these innovations have enhanced self-learning, leading to their better academic performance. This was supported by a review study conducted by Abeer et al (2023), who concluded that mobile learning, as a new educational technological innovation, has brought about educational transformation in teaching and learning processes in higher institutions. This finding was upheld by the hypothesis, which affirmed that there was a significant relationship between the new educational technology innovations on teaching-learning in nursing institutions in Kwara State. About two-thirds (71.0%) of the students felt that these innovations motivated them to learn new concepts, which improved their academic performance, as shown by an average mean score of 4.69. This finding implies that new educational technology innovations have a significant impact on the teaching and learning process

in nursing institutions of Kwara State. This study further shows an improvement over the previous studies by Fomsi and Ogo-chukwu (2019), which reported that earlier traditional teaching and learning methods, considered to be a teacher-centered approach, make learners passive, and the products of schools rated low in creativity, critical thinking, and problem solving, eventually leading to poor academic performance of students.

**RQ3.** What is the relationship between the perceived effectiveness of internet-based strategies and the learning ability of students in nursing institutions of Kwara State?

This study revealed that there is a relationship between students' perceived effectiveness of specific internet-based educational strategies and the use of educational innovation. For example, 74% of them prefer using AI and Digital content compared to others in their institutions. Although only a few find these innovations easy to use, as the average percentage of them did not know how to operate some internet-based facilities. This finding was corroborated by the focus group also agreed that internet-based educational innovations increase nursing students' learning ability, and was supported by Almaiah et al (2019) and Dahri et al (2021), who observed that new digital skills have become important in school settings, as they potentially give students and teachers the abilities needed to succeed in the digital age. Furthermore, 63.3% of students opined that educational technological innovations enhance their understanding of the concept, which boosts their academic performance during their regular teaching-learning processes. 69.3% of students affirm that mobile teaching and online game-based learning strategies have an effect on their learning experiences, and adopting the digital content platform learning has significantly increased learning abilities at various institutions in Kwara state. Supporting these current findings, was findings which revealed that Perceived Usefulness has a significant direct effect on Performance Expectancy ( $\beta = 0.384$ ,  $t = 3.200$ ,  $p = 0.001$ ) and Feasibility of Adopting eLearning ( $\beta = 0.264$ ,  $t = 2.160$ ,  $p = 0.031$ ), and indirectly affects Behavioral Intention through Performance Expectancy ( $\beta = 0.140$ ,  $t = 1.967$ ,  $p = 0.049$ ) (Raffaele et al, 2025). Liu et al (2023), and Abeer et al (2023) in their study contended that the introduction of mobile teaching and learning and Games strategies for teaching-learning are effective in promoting learning, as it proved to be more motivational for students than non-gaming teaching methods.

## Conclusion

This study concluded that nursing students

demonstrated a strong preference for internet-based learning tools such as mobile learning, digital content platforms, AI learning, and game-based learning, as these technologies were perceived to enhance the learning process. Among these tools, AI learning and digital content emerged as the most preferred due to their ease of use. Mobile learning was also found to significantly motivate class attendance and improve learning abilities, although technical challenges—particularly unreliable internet connectivity and unstable electricity supply—posed major barriers. AI learning achieved the highest ratings in terms of motivation, ease of adoption, and overall effectiveness, yet its practical implementation remains hindered by infrastructural and operational constraints. The findings further revealed that nursing students' high preference for AI and digital content corresponds to their perception of these tools' effectiveness and their actual utilization. However, some students continue to struggle with these technologies due to limited familiarity and inadequate digital literacy. In Kwara State, Nigeria, inconsistent internet access and unreliable power supply further restrict students' ability to engage with online learning resources. Moreover, insufficient governmental and institutional support in improving digital and power infrastructure exacerbates the problem, hindering equitable access to internet-based educational tools. The study recommends that the government integrate internet-based educational innovations into Nigeria's Nursing Education Policy, ensure sufficient funding for technological advancement, and provide stable or alternative electricity sources in all nursing institutions. Educators are encouraged to cultivate a supportive learning environment that fosters digital adoption, while students should develop consistent habits of using internet-based educational tools to enhance their academic performance and engagement in nursing education.

## Declaration of Conflicting Interest

There is no Conflict of interest from the author, nor any individual or institution

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### Data Availability Statement

The dataset generated during and analyzed during the current study is available from the corresponding author upon reasonable request.

### Declaration of Use of AI in Academic Writing

AI was not used for scientific writings.

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