EDUCATUM JSMT Vol. 12 Number 1 (2026)
ISSN 2289-7070 / e-ISSN 2462-2451(24-32)
https://ejournal.upsi.edu.my/index.php/EJSMT/index

Assessment of Colleges of Education Pre-service Science Teachers' Experiences in Online Classes in Kwara State, Nigeria

Bello Ganiyu[1], Alabi Hafsat Imam[2], Bello Zakariyau Adebayo[3], Sulaiman Musa Mohammed[4], and Bello Ilias Ayorinde[5]

[1,2,4]Department of Science Education, University of Ilorin, Nigeria
[3]Kwara State College of Education, Ilorin, Nigeria
[5]Department of Information and Communication Technology, Nigeria Police Academy, Wudil, Kano State

*Corresponding author: sulaiman.mm@unilorin.edu.ng

Received: 20 February 2025; **Accepted:** 14 August 2025; **Published:** 5 March 2026

To cite this article (APA): Bello Ganiyu, Alabi Hafsat Imam, Bello Zakariyau Adebayo, Sulaiman Musa Mohammed, and Bello Ilias Ayorinde (2026) Assessment of Colleges of Education Pre-service Science Teachers' Experiences in Online Classes in Kwara State, Nigeria. EDUCATUM Journal of Science, Mathematics and Technology, 13(1), 24–32

To link to this article:

Abstract

The emergence of COVID-19 pandemic led to lockdown in most countries of the world, led to the adoption of emergency remote learning by many institutions. In this study, online learning experiences of pre-service science teachers in colleges of education in Kwara State was investigated. Purposive and snowball sampling techniques were employed in selecting six institutions and 241 pre-service science teachers who completed the online questionnaire. The questionnaire titled "College of Education Students' Online Learning Experiences (COESOLE) had a reliability index of 0.74. Data gathered was subjected to descriptive and inferential statistical analysis. It was found that: (i) Smart phones and WhatsApp were predominantly used for online learning and (ii) Regardless of their gender or institution type, most pre-service science teachers had no stressful experiences with online learning. It was recommended that institutions should adopt the use of online learning management systems and also integrate online teaching into peer teacher exercise.

Keywords: Online learning, Colleges of Education, Pre-service science teachers, Internet access, Gender

INTRODUCTION

The move to various forms of online teaching and learning that started in recent past has been expedited by the outbreak of Covid-19 pandemic globally. Educational institutions from elementary to university level are working harder than ever before to create engaging online learning experiences to deliver contents to students to promote meaningful learning. This has increase pressure on teachers to acquire a blend of 21st century emergent digital technology skills required to prepare online courseware and deliver online instructional using appropriate learning management system /online platform. Teachers are nearly burning out as they struggle to keep with the demands. According to Sadiku *et al* (2018), online learning is delivered

via the internet and includes web-based materials and activities [1]. It refers to synchronous and asynchronous courses delivered via the internet. It is also known as e-learning and virtual learning. Online learning as a platform that appears in a formal context and uses varieties of multimedia technologies to provide material to learners [2]. It has practically become the most common form of learning that takes place over a long distance (Distance Learning) instead of the traditional Face-to-Face classroom.

Literature is awash with benefits of online learning for instance it helps students to stay current with technology; introduces new methods to collaborate; enhances students' time management abilities; encourages students to use digital textbooks and allows students to learn even more. Students prefer online learning because E-learning guarantees that they are totally involved as learning takes with writings, recordings, sounds, collaborative sharing, and interactive graphics [3]. Furthermore, online learning is flexible, allowing for opportunities for a diverse spectrum of students, including those who must combine employment and returning to school, as well as those with medical concerns. It encourages critical thinking, virtual communication, and cooperation skills, as well as employability traits that employers seek in new hires, such as self-determination. Some of these skills are needed most especially by teachers who wants to remain relevant in the 21st century with the advent of information and communication technological tools.

Although 21st century students are often considered digital natives because they are accustomed to using IT gadgets, there are signs that the transition to online learning is not without challenges for them. There have been reports of student resistance to online learning in many educational institutions. Consistent with this assertion, several studies have been conducted to examine student experiences with online learning. For example, Llomaki and Lakkala (2020) studied Finnish secondary school students' experiences with online courses [4]. The results indicated that students had generally positive experiences with online courses and were satisfied with all essential features of online learning. Yates, Starkey, Egerton, and Yates (2021) conducted a descriptive study of secondary school students' experiences with online learning. Research results show that most students have difficulty finding motivation to learn [5]. Research results by Maher (2021) show that students' online learning experiences are varied, with the majority reporting lower-level versus higher-level learning experiences [6]. The findings of the study conducted by Barrot, *et al* (2021) demonstrated that the greatest challenges students faced when learning online came from their home learning environment, while Literacy and Technology Skills were the least challenging [7]. In a study conducted by Ramani (2021), students reported more positive experiences with online learning than negative experiences [8]. Students reported frequent challenges in online learning such as distractions, lack of adequate equipment and technical support, access to quality headphones, and reliable internet connectivity in a study conducted by Moustakas (2022) [9]. Furthermore, it was found that the adoption of online teaching is a significant barrier for students and teachers in Nigeria due to lack of knowledge of information and communication technology as well as inadequate infrastructure to enable online learning, as reported by Eli-Chukwu *et al* (2022) [10].

As observed by Price (2006), educators are concerned about fairness in online learning because females appear to face unique problems and difficulties in their interactions with computers and information and communication technology (ICT) in general [11]. For instance, females outperformed males in online self-regulated learning [12]. However, while males and females have different online learning experiences, there are some similarities. The delivery of online learning to students is often impacted by the discrepancies in availability of ICT facilities between private and public schools. In Nigeria most private schools switched to online learning in 2020 due to the outbreak of COVID-19, whereas most public schools were unable to change to online learning because of lack of ICT facilities.

Despite the fact that many studies have looked into students' online learning experiences, the majority of them were not done among students in teacher education institutions. Furthermore, because just a handful of the researches were conducted in Nigeria, there is a paucity of information about Nigerian pre-service science teachers' online learning experiences. As a result, the goal of this study was to close this gap because it is possible that pre-service teachers' online learning experiences will influence their attitude toward using online learning as an instructional method when they start teaching.

Purpose of the Study

The goal of this study was to investigate pre-service science teachers in both public and private colleges of education in Kwara State, online learning experiences in terms of (i) access to online learning ICT equipment, (ii) internet access, (iii) access to electricity, (iv) convenience of using ICT devices, and (v) distractions. Institution type and gender are moderator variables that were considered in the study. Specific purposes for the study include

a. determining the types of online ICT devices and the online platforms mostly used by the pre-service teachers
b. Ascertaining if difference existed in the online experiences of male and female pre-service science teachers
c. Finding out if difference occurred in the online experiences of male and female pre-service science teachers

Research Questions

In line with the set purpose the following research questions were addressed:

1. What types of online learning ICT devices and online learning platforms are mostly used by the Pre-service science teachers?

Research Hypotheses

The following research hypotheses were postulated for this study:

H_{01}: There is no significant difference in the online experiences of male and female pre-service science teachers
H_{02}: There is no significant difference in the online experiences of pre-service science teachers based on institution type

MATERIALS AND METHODS

Research method

To assess the pre-service science teachers' online learning experiences in all Colleges of Education located in Kwara State, Nigeria, the study adopted the use of descriptive research of the survey type. Descriptive research of the survey type involves collecting data through questionnaires or interviews to collect qualitative and quantitative data. In line with best global practices, all ethical issues concerned with the use of human as samples such as avoiding deceptive practices, minimizing risks, protecting anonymity,

informed consent and right to withdraw in research were addressed by the researchers in the process of gathering data [13]. The instrument for data collection was designed using the Google Form and the first part requires the participants filling an informed consent form, it was also made known to the respondents that their identities would not be divulged at any point in time and that they can opt not to fill the form since they are taking part in the research voluntarily.

Participants

The population for the study was all pre-service teachers in all Colleges of Education in Kwara State, while the pre-service science teachers served as the target population. All the six Colleges of Education in Kwara State that switched to online Emergency Remote Teaching during the COVID-19 pandemic school lockdown were selected using the purposive sampling method, while the 241 pre-service science teachers who served as the sample for the study were selected using the snowball sampling technique. Snowball sampling was more appropriate since the samples were collected during the COVID-19 lockdown as it allows the respondents to share the link with other respondents in other Colleges that shares similar traits

Data collection tool

The research instrument utilized in data gathering process was an online researcher's designed questionnaire titled "College of Education Students' Online Learning Experiences (COESOLE). The questionnaire was administered online for a duration of six weeks using the Google Form.

To ensure the credibility of the instrument, it was subjected to both face and content validity. The validation process entails the preparation of the draft instrument from literature and the given of the instrument to two validators in the field of educational technology, and one in test and measurement at the University of Ilorin. The suggestions and corrections made by the validators were critically examined, and after due consultations with them, they were implemented. The final draft of the instrument was then prepared using the Google Form. The instrument was administered to pre-service teachers that shares similar attributes with the sample in one of the colleges of education in Kwara State, Nigeria that was not sampled among the final set of colleges of education that took part in the study. Using Cronbach alpha statistics, the questionnaire (COESOLE) was properly validated, yielding a reliability index of 0.74.

Research Assistants in each of the selected colleges helped to direct the attention of the pre-service science teachers to the online questionnaire. Items in Section A of the questionnaire sought for the demographic data of the respondents while items in Section B sought for the pre-service science teachers' experiences with online learning. The items in the questionnaire form were derived from reviewed literature on online learning.

Collection of data

The research took place during the Covid-19 lockdown and the data for the research was gathered using an online researcher's designed questionnaire. Due to the lockdown in place, online Google forms were designed and all ethical considerations required for using human as sample were put into consideration. The consent of the respondents was sought as contained in the Google form.

Data analysis

The data obtained in the study were analysed using descriptive and inferential statistics. The research question was analysed using frequency count, while the hypotheses were tested using chi-square statistics at 0.05 alpha level of significance.

RESULTS AND DISCUSSION

Data gathered with the aid of the instrument were subjected to both inferential and descriptive statistics. Frequency counts and percentages were used in answering research questions one and two, while research questions three to twelve with their corresponding hypothesis were analyzed using chi-square test at 0.05 alpha level of significance.

Out of 241 pre-service science teachers sampled for this study, 76 (31.5%%) were males while 165 (68.5%) were females. Also, 188 (78.0%) of the participants were from the government owned institutions while 53 (22.0%) were from the private owned institutions.

Answering of Research Question

Participants' responses were subjected to item-by-item analysis using mean. For online learning ICT devices, a cut-off score of 2.50 was used for determining participants' responses since the questionnaire items were structured in a four-response-type. Hence, items whose mean scores were equal or above 2.50 were remarked as being ***used*** while items with the mean scores below 2.50 were remarked otherwise.

For the most used online learning platforms used on the other hand, items whose mean scores were closed to 1.0, 2.0, 3.0 and 4.0 were remarked as *mostly used; occasionally used; less used;* and *not used*; respectively

Question: What types of online learning ICT devices and online learning platforms are mostly used by the Pre-service science teachers?

As revealed in Table 1, such types of online learning ICT devices used by pre-service science teachers were smart phones, iPhones, laptops and tablets while desktop, TV and other devices were not being used.

Also, Table 1 showed that the ***most used*** online learning platforms by the pre-service science teachers were WhatsApp, google class and zoom while online textbook, email and YouTube were ***occasionally used***. However, telegram, blogs websites and others were platforms that were being ***less used*** by the pre-service science teachers.

Table 1: Devices and Online Learning Platforms used by Pre-service Science Teachers for Online Learning

Online Learning ICT devices Used					Most Used Online Learning Platforms				
N	**ICT Devices**	**Mean**	**S.D.**	**Remark**	**N**	**Platforms**	**Mean**	**S.D.**	**Remark**
1	Smart Phone	3.84	0.73	Used	1	WhatsApp	3.83	0.94	Mostly Used
2	iPhone	3.71	1.03	Used	2	Google Class	3.77	0.83	Mostly Used
3	Laptop	3.93	1.16	Used	3	Zoom	3.69	1.13	Mostly Used
4	Tablet	2.62	1.21	Used	4	Online Textbook	3.29	1.19	Occasionally
5	Desktop	2.38	1.28	Not Used	5	Email	3.17	1.24	Occasionally
6	TV	1.63	1.26	Not Used	6	YouTube	2.84	1.22	Occasionally
7	Others	1.29	1.33	Not Used	7	Telegram	2.41	1.27	Less Used
					8	Blogs Website	2.36	1.18	Less Used
					9	Others	2.27	1.24	Less Used

Hypothesis Testing

Hypotheses were tested using independent t-test at 0.05 alpha level

Ho_1: There is no significant difference in the online experiences of male and female pre-service science teachers

Table 2 shows that the t-value 0.636 was obtained with a p-value of 0.113 when computed at 0.05 alpha level. Since the p-value of 0.113 is greater than 0.05 level of significance, the null hypothesis three is not rejected. Therefore, there was no statistically significant difference in the online experiences of male and female pre-service science teachers ($t_{\{239\}} = 0.636$; $p>0.05$).

Table 2: t-test statistics showing the difference in the online experiences of male and female pre-service science teachers

Gender	**No**	**Mean**	**S. D.**	**df**	**t-value**	**Sig**	**Remark**
Male	76	32.117	3.361	239	0.636	0.113	Not Rejected
Female	165	31.622	3.422				

**Insignificance at p>0.05*

Ho_2: There is no significant difference in the online experiences of pre-service science teachers based on institution type

As shown in Table 3 the t-value 0.480 was obtained with a p-value of 0.171 when computed at 0.05 alpha level. Since the p-value of 0.171 is greater than 0.05 level of significance, the null hypothesis three is not rejected. This signifies that no statistically significant difference occurred in the online experiences of pre-service science teachers based on institution type ($t_{\{239\}} = 0.480$; $p>0.05$).

Table 3: t-test statistics showing the difference in the online experiences of pre-service science teachers based on institution type

Institution Type	No	Mean	S. D.	df	t-value	Sig	Remark
Government	188	33.238	3.417	239	0.480	0.171	Not Rejected
Private	53	32.762	3.395				

**Insignificance at p>0.05*

CONCLUSION

Findings from this study revealed that smart phone was the most widely used gadget to engaged on online learning. This may be due to the popularity of smart phone in Nigeria as well as its relative cheap price and portability compare to another alternative ICT device. Furthermore, results of this study indicated that WhatsApp was the most widely used platform for the pre-service science teachers' online learning lessons by their lecturers. This result suggests that conventional online learning management systems like Moodle, were not available in the colleges. The finding is not astounding since many educational institutions especially in Nigeria lack online learning facilities. It is arguable that the use of WhatsApp as online learning platform cannot be compared with online learning management system with respect to effectiveness and efficiency. The pre-service science teachers' lecturers, on the other hand, should be commended for using WhatsApp as an improvised online learning platform. The findings of this study revealed that, most pre-service science teachers had no trouble accessing ICT devices, the internet, or electricity and that many had moderately easy access. This could be due to use of smart phone to access the internet quickly and cheaply. The battery in smart phone only has to be charged on occasion, reducing reliance on a steady supply of electricity. This result contrasted the conclusions of [9] and [10]. It was, however, consistent with Ramani (2021)'s report [8].

Operating online ICT devise was not a difficult experience for majority of the pre-service science teachers. This was not surprising since it is a well-known fact that most 21st century students are prolific users of smart phone and social media platforms such as WhatsApp. The finding was in accord with the report of Barrot *et al* (2021) who noted that technical literacy and competency posed the least difficulty to students. This study found that, fewer pre-service science teachers had high levels of distraction than those who experienced low or mild levels. The findings contradicted Ramani's (2021) reports [8], which suggested that distraction was a prevalent and recurring challenge. Another finding of this study was that there were no significant differences in pre-service science teachers' experiences. This finding seemed to imply that pre-service science teachers had been exposed to a similar learning environment.

Based on the outcomes of this study, it was concluded that pre-service teachers had a positive experience with online learning in general hence, are in vantage position to develop interest in the adoption of online teaching and learning It was recommended that pre-service science teachers should be exposed to the usage of Learning Management Systems (LMS). The principles and practice of improvisation, as evidenced by the lecturers' use of WhatsApp instead of LMS platform should be encouraged with the adoption of blended learning as regular mode of instruction in colleges of education to further enrich the pre-service science teachers' online learning experience. Furthermore, the pre-service science teachers should be made to deliver online instruction during peer teaching exercise.

CONFLICT OF INTEREST

We declare no conflict of interest in this article

AUTHOR CONTRIBUTION

Bello Ganiyu Conceptualization, Methodology, Software. Author name **Sulaiman Musa Mohammed**: Data collection, Writing original draft. **Bello Ilias Ayorinde**: Visualization, Investigation. **Alabi Hafsat Imam**: Supervision. **Bello Zakariyau Adebayo**: Software, Validation, Writing, Reviewing and Editing

DATA AVAILABILITY

All data generated or analyzed during this study are included in this published article.

DECLARATION OF GENERATIVE AI

Not applicable.

ETHICS

Not applicable.

REFERENCES

[1] Sadiku, M. N. O., Adebo, P. O., & Musa, S. M. (2018). Online teaching and learning. International Journal of Advanced Research in Computer Science and Software Engineering, 8(2), 73-75

[2] Samsuri, N. N., Nadzri, F. A., & Rom, K. B. M. (2014). A Study on the student's perspective on the effectiveness of using elearning. Procedia-Social and Behavioural Sciences, 123, 139-144.

[3] Al Rawashdeh, A. Z., Mohammed, E. Y., Al Arab, A. R, Alara, M., & Al-Rawashdeh, B. (2021). Advantages and Disadvantages of Using e-Learning in University Education: Analyzing Students' Perspectives. The Electronic Journal of e-Learning, 19(2), 107-117

[4] Llomaki, L., & Lakkala, M. (2020). Finnish upper secondary school students experiences with online courses. Education in the North, 27(2), 73-91 https://doi.org/10.26203/jsaz-8714

[5] Yates, A., Starkey, L., Egerton, B., & Flueggen, F. (2021). High school students' experience of online learning during Covid-19: the influence of technology and pedagogy. Technology, Pedagogy and Education, 30(1), 59-73. https://doi.org/10.1080/1475939X.2020.1854337

[6] Maher, D. (2021). Impact of Covid-19 lockdowns on Australian primary and secondary school students' online learning. Social Education Research. DOI: https://doi.org/10.37256/ser.2220211062

[7] Barrot, J.S., Llenares, I.I. & del Rosario, L.S. (2021). Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines. Education and Information Technology, 26, 7321–7338. https://doi.org/10.1007/s10639-021-10589-x

[8] Ramani, P. (2021). Challenges Faced by Students Due to Online Learning during this COVID-19 Pandemic Situation. International Journal of Management and Humanities, 5(9), 1-11.

[9] Moustakas, L. (2022).The challenges and realities of e-learning during COVID-19: The case of university sport and physical education. Challenges, 13(1), 9 https://doi.org/10.3390/challe13010009

[10] Eli-Chukwu, N.C., Igbokwe, I.C., Ifebude, B., Nmadu, D., Iguodala, W., Uma, U., Onyeneke, R.U., &Akudo, F.U. (2022). Challenges confronting e-learning in higher education institutions in Nigeria amid Covid -19. Journal of Applied Research in Higher Education. https://doi.org/10.1108/JARHE-09-2021-0346

[11] Price, L. (2006). Gender differences and similarities in online courses: Challenging stereotypical views of women. Journal of Computer Assisted Learning, 22(5), 349-359

[12] Liu, X., He Wei, Z. L., & Hong, J. (2021). Differences in self-regulated online learning during the covid-19 lockdown. Frontiers in Psychology, 12. https://doi.org/10.3389/fpsyg.2021.752131

[13] Rana, J., Dilshad, S., & Ahsan, Md. A. (2021). Ethical Issues in Research in A. Farazmand (ed.), Global Encyclopedia of Public Administration, Public Policy, and Governance, Springer Nature: Switzerland. https://doi.org/10.1007/978-3-319-31816-5_462-1