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Pre-Service Teachers' Attitude and Access to Utilization of Virtual Classroom for Learning

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ABSTRACT

The study was carried out to determine the attitudes and access to virtual classrooms that pre-service teachers had for learning in Kwara State, Nigeria. A descriptive survey design was embraced for the study, with 120 education students as the respondents. The research instruments were subjected to expert scrutiny to ascertain content validity, while a pilot study revealed a reliability coefficient. Descriptive statistics (mean, frequency, and percentage) addressed the research questions, while independent sample t-tests were adopted to test the hypotheses. There was a general positive attitude towards a virtual classroom. This translates to the majority of the respondents strongly agreeing that their attitudes were good. The degree of access to the virtual classroom was favourable as well, though with some notable disparities, indicating good access but leaving room for improvement. The test for hypothesis reveals no significant difference between males and females in the attitudes of pre-service teachers towards virtual classrooms, but there was a significant difference in terms of access of pre-service teachers to virtual classrooms in favour of males over females. While pre-service teachers have a positive attitude towards virtual classrooms, gender disparity in access still exists. Educational institutions leverage these positive attitudes by enhancing infrastructure and ensuring equitable access to virtual learning environments for all students.

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1. INTRODUCTION

Information and Communication Technology (ICT) is a collection of technologies used for collecting, storing, processing, communicating, and delivering information connected with the teaching and learning processes (Ogunlade & Anaza, 2017). The world is converted into a minute global capsule, and anyone desirous of information would find it only a click away. ICT is used in education and encompasses all the contemporary digital tools such as computers and accessories, and the Internet that can be used in education to fulfil its goals (Aderogba *et al*., 2021). Technology has become one of the best means for teaching and learning, with or without school premises. This technology allowed the use of instructional methods to improve the quality of education and students' academic performance (Raja & Nagasubramani, 2018).

Globalisation has brought about a lot of technological changes around the world, and it has been reflected in teaching and learning. The concept of virtual classrooms is one of the recent trends in education, and teachers are adapting to it to overcome the barriers of teaching and learning. A virtual classroom is a set of teaching and learning tools that aims to improve the learning experience of students with the help of various technological devices (Biswas & Nandi, 2020). The virtual classroom provides an interactive learning environment by integrating Internet technology where students and faculty members can collaborate, interact, explain their ideas, and communicate in well-structured pedagogical and technical procedures (Elfeky & Elbyaly, 2021). A virtual classroom is an online classroom that allows participants to communicate with one another, view presentations or videos, interact with other participants, and engage with resources in work groups (Binitie *et al*., 2020).

Personal computers and the internet have revolutionised entire sectors of our society. Facebook, Twitter, YouTube, Skype, boom, zoom, and other online communications media allow billions of people around the world to share ideas in seconds and minutes at a meagre cost. People are becoming more aware of how computers and Internet technology are transforming the way students learn. This learning through the Internet as an emerging education paradigm is called virtual learning. Virtual classrooms are used by educators to replicate a conventional teaching and learning practice as it has been carried out for centuries (Barbour, 2009). The virtual classroom is a teaching-learning situation where participants can interact with the tutor and electronic learning materials in an online setting (Alasela *et al*., 2016).

Virtual classroom facilities encompass a variety of synchronous and asynchronous devices, such as e-mail, Newsgroups, Computer based training, quick reference guide, Screen sharing, Online seminar, Video conferencing, among others, to allow the students in the remote areas to be active participants in learning (Alasela *et al*., 2016). The teaching and learning with asynchronous and synchronous (Zoom) platforms will yield significant benefits when these methods are layered into face-to-face instruction (Hargis *et al*., 2021). Synchronous and asynchronous online collaborative learning has become common in teaching and learning processes (Ghilay, 2022). Findings have shown that there are several factors affecting learner participation in an online environment. Inequality of access to the virtual classroom itself by all the students which known as digital-divide and technophobia are part phenomenon that creates gap between people who possess regular access to technology, such as computers and their related functions like ability to get to the internet and those who do not have access. Also, there is still a large number of students and lecturers who have low ICT literacy skills.

Online learning opens the possibility of delivering services to individuals in remote areas. Access to online learning may vary depending on resources and proficiency with technology.

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There may be issues with structural inequities that affect the ability of educators and school administrators to deliver high-quality instruction. Limited access to online learning negatively affects how students learn and acquire new skills (Kim & Fienup, 2022). Kim and Fienup (2022) evaluated the effects of a simple intervention to increase access and engagement for students with disabilities who showed low engagement in online educational activities during the COVID-19 pandemic. Specifically, these students had the resources to access online learning but continued to show low rates of engagement due to environmental reasons.

Kaya (2021) pointed out that the likely reasons behind insufficient participation, which can be influenced by the characteristics of the students and instructors, and the course, can guide future instructional design plans and thus guide students toward successful and fruitful online learning experiences. Similarly, other study describes that stress is conditions that facilitate the utilisation of virtual classrooms. Internet access is one of the major obstacles facing the utilisation of virtual classrooms among lecturers and students for teaching and learning. In some cases, the network fluctuates and results in to malfunction of the virtual classroom learning strategy (Raes *et al*., 2020). The extent to which college and university students access e-learning resources. The study revealed that college students generally have a positive attitude about online resources and their impact on their educational experience (Gupta *et al*., 2004).

Joshi *et al*. (2024) asserted that socioeconomic and cultural factors often lead to disparities in access to technology, especially for female students in certain regions. These factors include limited access to resources like laptops and reliable internet, which can disproportionately affect female learners in virtual settings. Chiao and Chiu (2018) investigated the relationship between gender and socioeconomic status with students' ICT competences. The research revealed a noteworthy trend wherein girls demonstrate superior technical ICT skills and higher-order ICT competences compared to boys. Additionally, the study indicates a positive correlation between the educational level of mothers and students' ICT skills and competencies. This suggests that a higher educational level of mothers is associated with enhanced proficiency in information and communication technology among students.

Al-Hosni and Al-Dhahli's (2021) findings on undergraduate Students' Attitudes towards Online Language Classes during the COVID-19 Pandemic: Are Students Thriving or surviving? The participants are 155 undergraduate students who took online English requirements in the Centre for Preparatory Studies (CPS) at Sultan Qaboos University (SQU) in Spring 2021. A quantitative approach to data collection has been embraced to collect students' perspectives on different aspects related to their online learning experience. The findings showed that students have a generally positive attitude towards the online learning experience.

In addition, attitude has come to be considered as the level of positive or negative effect related to a specific object or belief (Delgado *et al*., 2019). Unger and Meiran (2020) studied student attitudes towards online education during the COVID-19 viral outbreak of 2020, and their result showed that the majority of students responded that online learning would not be the same as in-class learning. Accessibility in virtual classrooms is a crucial aspect of ensuring that all students, regardless of their abilities, can fully participate and engage with the learning materials. A study published in the Journal of Educational Technology Development and Exchange (2020) highlights the importance of accessibility in virtual classrooms, stating that "accessibility is not only a legal requirement, but also a moral imperative" (Botelho, 2021). To ensure accessibility, virtual classrooms should be designed with accessibility in mind. This includes using clear and simple language, providing closed captions and transcripts for audio and video content, and ensuring that interactive features

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are accessible and usable for all students (Wald, 2006). Additionally, virtual classrooms should be compatible with screen readers and other assistive technologies and should allow for keyboard navigation. Regular accessibility audits should also be conducted to identify and address accessibility barriers (Botelho, 2021).

Edache-Abah and Mumuni (2019) studied the effect of YouTube on the performance of secondary school students in biology concepts in the Ikwerre Local Government Area of Rivers. The result indicated that gender attitudes toward YouTube do not influence the students' use of YouTube. Ekunola *et al*. (2022) determine Pre-Service teachers' attitudes towards the application of Virtual Learning Environment (VLE) in teacher education. The findings revealed that gender was a factor in pre-service science teachers' attitudes towards the application of Virtual Learning Environment (VLE) in teacher education. Though both male and female pre-service teachers had positive attitudes towards VLE, the females were more inclined to the application of Virtual Learning Environment (VLE) in teacher education.

Education has witnessed a shift from conventional teaching to modern teaching, where technology tools are used for teaching and learning. These technologies enable students to learn from the comfort of their homes. Undergraduate students' attitude is a key component for effective learning in a virtual classroom. It is observed that there are challenges students face in a virtual classroom. It is observed that most students do not have a smartphone or laptop, the unavailability of network, shortage of devices for online learning, closure of internet cafés, lack of computer skills, and expensive internet data. Other challenges are like lack of face-to-face interactions, a lack of socialisation, distraction by social media, technology-related issues, and so on. The challenges highlighted are the most frequent in the virtual classroom. Therefore, students' participation in a virtual classroom is not encouraged.

Various studies on virtual classrooms have been carried out globally, however, there are no studies that specifically address students' participatory level in the virtual classes offered at the University of Ilorin. Students' perception of online learning during the COVID-19 pandemic in Poland. The result shows that the majority of the students had never experienced any form of e-learning before the pandemic, hence, they identified technical issues as one of their key challenges.

Despite the potential benefits of virtual classrooms in enhancing flexibility, accessibility, and personalised learning, pre-service teachers' negative attitudes towards their utilisation hinder the full realisation of these benefits. This challenge is particularly concerning in the context of Nigeria, where the digital divide and technology challenges are prevalent. According to a recent report by the National Bureau of Statistics (2022), only 44.3% of households in Nigeria have access to the internet, with rural areas and low-income households being disproportionately affected. Furthermore, a study by the UNESCO Institute for Statistics (2020) revealed that 64% of Nigerian teachers lack the necessary skills to effectively integrate technology into their teaching practices. If left unaddressed, this challenge will continue to compromise the quality of learning outcomes, perpetuating the cycle of educational disadvantage and limiting the potential of future generations. Therefore, this study will bridge the gap in previous studies by investigating pre-service teachers' attitudes towards the utilisation of virtual classrooms for learning in Kwara State.

The purpose of the study is in the following:

(i) Assess pre-service teachers' attitudes toward continuing the use of virtual classrooms after the pandemic period.
(ii) examine pre-service teachers' access to continuing the use of virtual classrooms after the pandemic period.

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(iii) Assess pre-service teachers' attitudes toward virtual classroom utilisation between male and female pre-service teachers.
(iv) examine pre-service teachers' access to virtual classroom utilisation between male and female pre-service teachers.

Research questions are in the following:

(i) What are pre-service teachers' attitudes toward continuing the use of virtual classrooms after the pandemic period?.
(ii) What is pre-service teachers' access to continuing the use of virtual classrooms after the pandemic period?.

The research hypotheses are in the following:

(i) HO1: There is no significant difference between male and female pre-service teachers' attitudes towards virtual classes.
(ii) HO2: There is no significant difference between male and female pre-service teachers' access to virtual classes.

2. METHODS

This study focuses on pre-service teachers' attitudes and access towards the utilisation of virtual classrooms for learning in Kwara State. A descriptive research design of a survey type was adopted in the study. The population for this study was all students at the University of Ilorin. The target population for this study was all students in the faculty of education at the University of Ilorin. A random sampling technique was used to select one hundred and twenty students (120), male and female respondents, from the Faculty of Education. The instruments were subjected to both validity and reliability. Validity was established through expert reviews and content validation, while the reliability of the instruments was ensured through a pilot study with Cronbach's alpha values of 0.82. Descriptive statistics (Mean) were used to answer research questions. The research hypothesis was tested using a t-test. All hypotheses were tested at the 0.05 level of significance.

3. RESULTS AND DISCUSSION

3.1. Demographical Data

Table 1 provides the distribution of respondents based on their academic level. Out of a total of 123 respondents, 24 are in their 200 level, representing 19.5% of the total population. The majority of the respondents, 53 in total, are in their 400-level, accounting for 43.1%. Those in their 300 level make up 46% of the respondents, contributing 37.4%.

Table 1. Distribution of respondents based on academic level.

Level	Frequency	Percentage (%)
2001	24	19.5
3001	46	37.4
4001	53	43.1
Total	**123**	**100.0**

Table 2 shows the distribution of respondents based on gender. Out of a total of 123 respondents, 45 are male, representing 36.6% of the total population. Meanwhile, 78 respondents are female, making up 63.4% of the group.

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Table 2. Distribution of respondents based on academic level.

Gender	Frequency	Percentage (%)
Male	45	36.6
Female	78	63.4
Total	**123**	**100.0**

3.2. Research Question One

The first research question is "what are pre-service teachers' attitudes toward continuing the use of virtual classrooms after the pandemic period?". **Table 3** analyses the pre-service teachers' attitudes toward virtual classrooms, demonstrating a generally positive outlook, with most respondents either strongly agreeing (SA) or agreeing (A) with positive statements about virtual classrooms. For example, in item 1, 52.8% of respondents strongly agreed that they had a favourable attitude toward virtual classrooms, while 36.6% agreed, resulting in a mean score of 1.60. Across all items, the average mean score of 1.68 reflects an overall positive attitude toward virtual classrooms, with a minimal number of respondents disagreeing (D) or strongly disagreeing (SD). The result is in line with other findings (Al-Hosni & Al-Dhahli, 2021), who examined undergraduate Students' Attitudes towards Online Language Classes during the COVID-19 Pandemic. The findings showed that students have a generally positive attitude towards the online learning experience.

Table 3. Pre-service teachers' attitude toward virtual classroom.

	SA		A		D		SD		
Item	F	%	F	%	F	%	F	%	**Mean**
I believe virtual classrooms should continue to be used for learning after the pandemic.	65	52.8%	45	36.6%	10	8.1%	3	2.4%	1.60
Virtual classrooms provide flexibility in learning that I find beneficial even after the pandemic.	59	48.0%	46	37.4%	15	12.2%	3	2.4%	1.69
I am confident in my ability to effectively participate in virtual classrooms post-pandemic.	66	53.7%	47	38.2%	7	5.7%	3	2.4%	1.57
Virtual classrooms are just as effective as traditional classrooms for learning after the pandemic.	36	29.3%	62	50.4%	21	17.1%	4	3.3%	1.94
I would prefer to continue using virtual classrooms for certain subjects after the pandemic.	51	41.5%	66	53.7%	3	2.4%	3	2.4%	1.66
I find virtual classrooms to be a valuable tool for enhancing my learning experience.	58	47.2%	49	39.8%	16	13.0%	0	0.0%	1.66
Continuing the use of virtual classrooms after the pandemic will improve my overall academic performance.	58	47.2%	51	41.5%	11	8.9%	3	2.4%	1.67
Average Mean									**1.68**

3.3. Research Question Two

The second research question is "what is pre-service teachers' access to continuing the use of virtual classrooms after the pandemic period?". **Table 4** presents pre-service teachers' access to virtual classrooms, showing that access is generally favourable, though some disparities are evident. For instance, in item 1, 46.3% of respondents strongly agreed that they had access to virtual classrooms, while 35.0% agreed, giving a mean score of 1.75. However, some items, like 4, show a less positive result, where 22.0% strongly agreed, but 32.5% disagreed, leading to a mean score of 2.37. Overall, the average mean of 1.95 suggests

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that, while access is generally perceived as good, some challenges persist. The result negates the other report (Kim & Fienup, 2022), limited access to online learning negatively affects how students learn and acquire new skills.

Table 4. Pre-service teachers' attitude toward virtual classroom.

Item	SA		A		D		SD		
	F	%	F	%	F	%	F	%	**Mean**
I have reliable access to the internet for participating in virtual classrooms.	57	46.3%	43	35.0%	20	16.3%	3	2.4%	1.75
The technology (e.g., laptop, smartphone, etc.) I have sufficient for continue to use virtual classrooms after the pandemic.	45	36.6%	60	48.8%	15	12.2%	3	2.4%	1.80
My school provides adequate technical support to ensure smooth access to virtual classrooms.	34	27.6%	51	41.5%	34	27.6%	4	3.3%	2.07
I do not face any significant barriers (e.g., lack of internet, devices) in accessing virtual classrooms post-pandemic.	27	22.0%	40	32.5%	40	32.5%	16	13.0%	2.37
The learning platforms used in virtual classrooms are easy to access and navigate.	36	29.3%	59	48.0%	22	17.9%	6	4.9%	1.98
I have access to a quiet and conducive learning environment to participate in virtual classrooms.	63	51.2%	46	37.4%	11	8.9%	3	2.4%	1.63
I would have no difficulty in continuing to access virtual classrooms if they remain a part of the learning process post-pandemic.	37	30.1%	59	48.0%	15	12.2%	12	9.8%	2.02
Average mean									**1.95**

3.4. Research Hypothesis One

The first research hypothesis one is “there is no significant difference between male and female pre-service teachers’ attitudes towards virtual classes”. **Table 5** shows the Independent Sample T-test table comparing the attitudes of male and female pre-service teachers toward virtual classrooms. The mean attitude score for males is 1.82 (SD = 0.650) and for females, it is 2.01 (SD = 0.830). The degree of freedom (df) is 121, and the t-value is -1.324 with a significance value of 0.188 ($p > 0.05$). Since the p-value (0.188) is greater than the threshold of 0.05, we fail to reject the null hypothesis. This means that there is no

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statistically significant difference between the attitudes of male and female pre-service teachers toward virtual classrooms. The result supports the findings (Edache-Abah & Mumuni, 2019), who studied the effect of YouTube on the performance of secondary school students in biology concepts in the Ikwerre Local Government Area of Rivers. The result indicated that gender attitudes toward YouTube do not influence the students' use of YouTube. Lastly, the result showed that there was no significant difference in pre-service teachers' access to virtual classes based on level.

Table 5. Independent Sample T-test showing significant difference between males and females on attitude toward virtual classroom between male and female pre-service teachers.

Gender	N	X	SD	df	t	Sig. (2-tailed)	Decision
Male	45	1.82	0.650				
				121	-1.324	0.188	**Accepted**
Female	78	2.01	0.830				

3.5. Research Hypothesis Two

The second research question is "there is no significant difference between male and female pre-service teachers' access to virtual classes". **Table 6** shows the Independent Sample T-test table, which compares access to virtual classrooms between male and female pre-service teachers. The mean access score for males is 2.07 (SD = 0.751), while for females, it is 2.54 (SD = 1.041). The degree of freedom (df) is 121, and the t-value is -2.665, with a significance value (p-value) of 0.009. Since the p-value (0.009) is less than the 0.05 threshold, we reject the null hypothesis. This indicates a statistically significant difference in access to virtual classrooms between male and female pre-service teachers. Specifically, females reported less access compared to their male counterparts. This supports the Studies by Joshi *et al*. (2024), which suggest that socioeconomic and cultural factors often lead to disparities in access to technology, especially for female students in certain regions. These factors include limited access to resources like laptops and reliable internet, which can disproportionately affect female learners in virtual settings.

Table 6. Independent Sample T-test showing significant difference between males and females in access to virtual classrooms between male and female pre-service teachers.

Gender	N	X	SD	df	t	Sig. (2-tailed)	Decision
Male	45	2.07	0.751				
				121	-2.665	0.009	**Not Accepted**
Female	78	2.54	1.041				

4. CONCLUSION

Findings from the study revealed that pre-service teachers are generally positive about the virtual classroom, with most agreeing with positive statements. The overall mean score of 1.68 suggests that participants who were positively inclined towards virtual learning environments were greatly inclined. However, while virtual classrooms are generally perceived to provide good access (mean = 1.95), there seem to be some exceptions, especially in particular items, where a considerable percentage of respondents claimed limited access. No significant difference exists when comparing pre-service teachers' gender on attitudes

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toward the virtual classrooms ($p > 0.05$). Nevertheless, a significant difference was found for access, with female pre-service teachers having less access compared to their male colleagues ($p < 0.05$). Therefore, disparities in access have to be addressed if participation in virtual learning environments is to be made equitable across genders. Based on the findings of the study, the following recommendations for further research are proposed:

(i) Given the overall positive attitude toward virtual classrooms, institutions should capitalise on this by promoting the benefits of online learning environments.
(ii) Schools and educational authorities should set up monitoring systems to track access to virtual classrooms.
(iii) The significant difference in access between male and female pre-service teachers indicates the need for gender-specific support programs.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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