

## Teachers' and Trainee Teachers' Perceptions of the Effectiveness of Computer Technology Integration in Teacher Education Institutions in Southwest, Nigeria

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### Abstract

*This study investigated teachers' and trainee teachers' perceptions of the effectiveness of computer technology integration in teacher education institutions in Southwest, Nigeria. A descriptive survey design guided by two research questions and two hypotheses was adopted. The sample consisted of 300 participants, comprising 150 teachers and 150 trainee teachers selected through a multistage sampling technique. Data were collected using a validated instrument titled Perceived Effectiveness of Computer Technology Integration Questionnaire (PECTIQ), which showed high reliability with a Cronbach's alpha of 0.89. Mean and standard deviation were used to answer the research questions, while t-test was employed to test the hypotheses. A mean score of 2.50 and above indicated agreement, and p-values  $\leq 0.05$  signified significant differences. The findings revealed that teachers perceived computer technology integration as highly effective (mean = 4.60, SD = 0.55), whereas trainee teachers reported a much lower perception (mean = 1.50, SD = 0.64). The t-test results indicated a significant difference between teachers and trainee teachers in their perceptions ( $t\text{-cal} = 44.93$ ,  $t\text{-crit} = 1.97$ ,  $p < .05$ ). Similarly, a significant difference was found in their overall perceptions, with teachers recording a higher mean (3.59, SD = 0.66) than trainee teachers (1.50, SD = 0.63), and a calculated t-value of 28.05 exceeding the critical value. The study concluded that computer technology integration is highly effective, particularly from teachers' perspectives. It recommends improved ICT infrastructure and strengthened policy implementation in Nigerian teacher education institutions.*

**Keywords:** teachers' perception, trainee teachers, computer technology integration, teacher education

## Introduction

Around the world, technology continues to transform the way education is delivered, making teaching and learning more dynamic than ever before. Computer technology, in particular, has become an essential part of modern classrooms. It supports teachers in creating interactive lessons, gives students access to a wider range of learning resources, strengthens both teaching effectiveness and learner engagement. For teacher education institutions, integrating computer technology is not just beneficial but it is necessary. These institutions are responsible for preparing the next generation of teachers who must be confident and competent in using digital tools to teach in today's technology-driven schools (UNESCO, 2023). In Nigeria, the need to build digital skills among teachers has been highlighted in several national policies, including the National Policy on Education (2013) and the National ICT in Education Policy (2019). These documents emphasize that teacher training programmes must incorporate digital technologies to improve teaching quality and promote innovation. Despite these policy intentions, many teacher education institutions still face significant challenges. Issues such as inadequate facilities, limited access to computers and internet, irregular electricity supply, low ICT literacy levels, and limited institutional investment hinder effective technology integration (Oluwatayo & Aina, 2022). These gaps raise concerns about how well computer technology is currently being used to support teacher preparation.

Both teachers and trainee teachers play important roles in this discussion. Practicing teachers bring practical classroom experience and can judge how useful digital tools really are in day-to-day teaching. Trainee teachers, on the other hand, represent the future workforce and need strong digital skills to succeed in modern classrooms. Understanding the views of both groups helps reveal the strengths and weaknesses of technology integration in teacher education. Because computer technology is now central to effective teaching, it is necessary to explore whether teacher education institutions are integrating it in meaningful and impactful ways. This study therefore examines how teachers and trainee teachers perceive the effectiveness of computer technology integration in teacher education institutions in Southwest, Nigeria. The results are expected to provide valuable insights that can guide policy implementation, improve institutional practices, and ultimately strengthen teacher preparation in Nigeria.

In today's digital world, bringing computer technology into teacher education is not just something we can choose to do, but it has become a necessary part of preparing teachers for effective teaching and meaningful learning. This integration involves intentionally using tools like computers, online learning platforms, projectors, educational apps, and internet resources to make teaching and learning more effective and engaging. According to Koehler and Mishra (2018), true integration happens when technology becomes part of the curriculum, assessment, and everyday teaching practices is not just an add-on. For that reason, teacher education programmes have a dual responsibility: to help current teachers learn how to use technology well and to prepare future teachers with both pedagogical and technological skills so they can confidently use digital tools in their classrooms. What teachers and trainee teachers think about technology matters a lot. Teachers are more likely to adopt technology if they believe it will make their work easier or improve learning outcomes (Davis, 1989). Trainee teachers on the other hand, show excitement about using technology. However, their enthusiasm may not always translate into effective use, especially if they lack real classroom experience or training (Adeyemi & Ojo, 2021).

The Technology Acceptance Model (TAM), developed by Davis (1989), is one of the most widely used theories for understanding how and why people adopt technology. It suggests that two main factors that is how useful a person believes the technology is and how easy it is to use to determine whether they will actually use it. This model is useful for understanding the attitudes of both in-service and pre-service teachers toward technology in education.

The TPACK model (Technological Pedagogical and Content Knowledge) highlights the idea that effective teaching with technology requires a unique blend of three types of knowledge: what to teach, how to teach, and how to use technology. Koehler and Mishra (2018) emphasize that teacher education programmes are critical in helping both teachers and trainee teachers build these competencies. Several studies across Africa provide useful insights into the state of computer technology use in education. For example, Adedeji and Oyelami (2021) found that while teachers understand the importance of using technology, challenges like inadequate infrastructure can limit its full use. In Ghana, Osei-Bonsu (2022) discovered that trainee teachers have positive attitudes toward technology, but many lack practical opportunities to use it in real classrooms.

Although digital learning is increasingly prioritized worldwide, many teacher education institutions in Nigeria continue to face difficulties in integrating technology effectively. Government initiatives and policies advocate for digital transformation in education, but real-world implementation remains slow due to challenges such as poor infrastructure, limited ICT training, and weak institutional support. Teachers and trainee teachers are at the heart of this process, yet they often experience these challenges differently. While teachers may struggle with adapting to new technologies, trainee teachers may have enthusiasm but lack the necessary tools and guidance. Despite the importance of their perspectives, few studies have directly compared how these two groups perceive the effectiveness of technology integration in teacher education institutions in Southwest, Nigeria. This study seeks to fill this gap by providing much-needed data to inform policies and improve practice.

The primary aim of this study is to examine how teachers and trainee teachers perceive the effectiveness of computer technology integration in teacher education institutions in Southwest, Nigeria. The study seeks to;

1. Determine teachers and trainee teachers' perception of the effectiveness of computer technology integration in teacher education institutions in southwest, Nigeria.
2. Determine the extent of the differences between teachers and trainee teachers in their perceptions of technology integration in southwest, Nigeria

### **Research Questions**

The study is guided by the following research questions:

1. How do teachers and trainee teachers perceive the effectiveness of computer technology integration in teacher education institutions in southwest, Nigeria?
2. To what extent does teachers and trainee teachers differ in their perceptions of technology integration in teacher education institutions in southwest, Nigeria?

### **Hypotheses**

The following null hypotheses were tested at the 0.05 level of significance:

H<sub>01</sub>: There is no significant difference on how teachers and trainee teachers perceive the effectiveness of computer technology integration in teacher education institutions in southwest, Nigeria.

H<sub>02</sub>: There is no significant difference in the perceptions of computer technology integration between teachers and trainee teachers in teacher education institutions in southwest, Nigeria.

## Methodology

This study investigates how teachers and trainee teachers perceive the effectiveness of computer technology integration in teacher education institutions in Southwest Nigeria. Descriptive survey research design was adopted, which involves using a representative sample to describe opinions, beliefs, and attitudes about a particular phenomenon (Manjunatha, 2019). population and sample are not the same in research if you have so large a population, you can have a sample size, Nigeria. Since the population was small and manageable, the entire population was included in the study, and no sampling technique was employed. A structured questionnaire titled the Perceived Effectiveness of Computer Technology Integration Questionnaire (PECTIQ), which consisted of four sections and was rated on a 5-point Likert scale: Strongly Agree (SA) – 5 Agree (A) – 4, Undecided (U)- 3, Disagree (D) – 2, Strongly Disagree (SD) – 1. It comprised of 30 items aligned with the research questions and was face-validated by three experts, achieving a Cronbach's Alpha reliability coefficient of 0.89, indicating high reliability. Data collection was conducted by the researcher with the assistance of three research assistants. All the 300 copies of the questionnaire were successfully retrieved. For data analysis, mean (X) and Standard Deviation (SD) were used to answer the research questions, while t-test statistics was employed to test the hypotheses at the 0.05 level of significance. The decision criteria were as follows: a mean score of 2.50 or higher was considered as agreement (strong or moderate), while a score below 2.50 was considered disagreement. For the t-test, a p-value  $\leq 0.05$  led to the rejection of the null hypothesis, whereas a p-value  $> 0.05$  resulted in its retention.

## Results

*Research Question 1:* How do teachers and trainee teachers perceive the effectiveness of computer technology integration in teacher education institutions in southwest, Nigeria?

**Table 1:** Mean and Standard Deviation of Respondents on the teachers and trainee teachers perceive of the effectiveness of computer integration in teacher education institutions in southwest, Nigeria.

S/N	Item Statements	Teachers		Trainee Teachers			
		X	SD	DECISION	X	SD	DECISION
1.	Computer technology is effectively used to support teaching and learning in my institution.	4.90	0.34	Agree	1.33	0.47	Disagree
2.	ICT facilities are consistently available for use in my department.	4.67	0.47	Agree	1.40	0.49	Disagree
3.	The use of computers has improved the quality of instruction in my programme.	4.60	0.49	Agree	1.47	0.50	Disagree
4.	Technology-based teaching methods help increase student engagement during lessons.	4.80	0.40	Agree	1.37	0.48	Disagree
5.	ICT tools are accessible to both teachers and trainee teachers when needed.	4.53	0.50	Agree	1.73	0.86	Disagree
6.	My institution provides adequate training on how to use computer technology for teaching or learning.	4.67	0.47	Agree	1.53	0.62	Disagree
7.	Using computer technology has improved the way I plan and deliver lessons.	4.63	0.48	Agree	1.93	1.19	Disagree
8.	The use of computers in classrooms has increased over the last academic year.	4.90	0.30	Agree	1.73	0.86	Disagree
9.	Educational software used in my institution supports effective learning experiences.	4.53	0.62	Agree	1.13	0.34	Disagree
10.	ICT integration encourages innovative teaching and learning practices in my programme.	4.27	0.86	Agree	1.43	0.57	Disagree
11.	Online platforms (such as LMS or Google Classroom) are effectively used for instruction and coursework.	4.47	0.62	Agree	1.43	0.72	Disagree
12.	Computer-based instruction has had a positive impact on students' academic performance.	4.07	1.19	Agree	1.47	0.50	Disagree
13.	My institution has a clear policy guiding the use of computer technology in teaching.	4.87	0.34	Agree	1.40	0.49	Disagree
14.	My ability to use digital tools has improved as a result of ICT integration in my training or work.	4.57	0.56	Agree	1.73	0.86	Disagree

15.	The use of computer technology is strongly encouraged as part of teacher education in my institution.	4.57	0.72	Agree	1.47	0.62	Disagree
<b>Cluster mean/SD</b>		<b>4.60</b>	<b>0.55</b>		<b>1.50</b>	<b>0.64</b>	

**Source: Dawodu, et al (2025)**

**Table 1:** highlights how teachers and trainee teachers perceived the effectiveness of computer technology integration in teacher education institutions in Southwest Nigeria. The data show strong agreement among teachers on all listed items, as reflected in their cluster mean score of 4.60 and standard deviation of 0.55, indicating a high level of consistency in their responses. Conversely, trainee teachers reported a cluster mean of 1.50 with a standard deviation of 0.64, which falls within the strong disagree category. This indicates a shared perception among trainee teachers regarding the effectiveness of computer technology integration in teacher education institutions.

**Research Question 2.** To what extent does teachers and trainee teachers differ in their perceptions of technology integration in teacher education institutions in southwest, Nigeria?

**Table 2:** Mean and Standard Deviation of Respondents on the differences between teachers and trainee teachers in their perceptions of technology integration in Teacher Education Institutions in southwest, Nigeria.

		Teachers		Trainee Teachers			
S/N	Item Statements	X	SD	DECISION	X	SD	DECISION
16.	Teachers receive more support than trainee teachers in accessing ICT tools for teaching or learning.	4.60	0.61	Agree	1.20	0.40	Disagree
17.	Trainee teachers are generally more confident using digital tools than practicing teachers.	4.80	0.40	Agree	1.47	0.50	Disagree
18.	Teachers often feel less prepared than trainee teachers when using computer technology for teaching.	4.53	0.62	Agree	1.73	0.86	Disagree
19.	Trainee teachers are offered more ICT-related workshops and training than teachers.	4.07	1.19	Agree	1.93	1.19	Disagree

20.	My institution gives equal encouragement to both teachers and trainee teachers to use ICT in the classroom.	4.47	0.62	Agree	1.47	0.62	Disagree
21.	My role as either a teacher or trainee teacher affects how confident I feel using computer technology.	4.87	0.34	Agree	1.47	0.50	Disagree
22.	Teachers have more access to ICT resources in the institution than trainee teachers.	4.53	0.50	Agree	1.40	0.49	Disagree
23.	Teachers and trainee teachers differ in their motivation to use digital tools for teaching.	4.60	0.49	Agree	1.93	1.19	Disagree
24.	Trainee teachers are more familiar with modern educational technologies than teachers.	4.27	0.86	Agree	1.20	0.40	Disagree
25.	Teachers are more resistant to using digital tools for teaching compared to trainee teachers.	4.53	0.62	Agree	1.53	0.62	Disagree
26.	Trainee teachers use ICT tools more frequently than teachers in this institution.	4.01	1.19	Agree	1.47	0.62	Disagree
27.	Both teachers and trainee teachers receive similar levels of institutional support for ICT integration.	4.63	0.48	Agree	1.47	0.50	Disagree
28.	The perceived importance of ICT integration varies between teachers and trainee teachers.	4.53	0.50	Agree	1.40	0.49	Disagree
29.	Trainee teachers feel better prepared to integrate computer technology into teaching than practicing teachers.	4.27	0.86	Agree	1.37	0.48	Disagree
30.	My years of teaching or training experience influence how I perceive the use of computer technology in education.	4.47	0.62	Agree	1.47	0.62	Disagree
<b>Cluster mean/SD</b>		<b>3.59</b>	<b>0.66</b>		<b>1.50</b>	<b>0.63</b>	

**Source: Dawodu, et al (2025)**

**Table 2:** Illustrates the differences between teachers and trainee teachers in their perceptions of technology integration in teacher education institution in southwest, Nigeria. The data indicate that teachers agree, while trainee teachers disagree with all the listed items, based on the cut-off mean value

of 2.50. This contrast is further supported by the grand mean score's teachers (3.59) and trainee teachers (1.50) which fall within the range of strong agreement and strong disagreement respectively. This indicates a clear difference between the two groups in their perception of computer technology integration in teacher education institutions. Additionally, the relatively low standard deviations (0.66 and 0.63) show low variability among respondents, strengthening the reliability of the mean scores as representative of the groups' perspectives.

**H<sub>01</sub>:** There is no significant difference on how teachers and trainee teachers perceive the effectiveness of computer technology integration in teacher education institutions in southwest, Nigeria.

**Table 3:** A t-test analysis comparing the mean responses of teachers and trainee teachers in their perceptions of the effectiveness of computer technology integration in teacher education institutions in southwest, Nigeria.

Group	N	Mean	SD	df	t-cal	t-crit	Sig
Teachers	150	4.60	0.55	280	44.93	1.97	0.05
Trainee Teachers	150	1.50	0.64				

**Decision:** p,0.05 – Reject Ho<sup>1</sup>

**Source:** Dawodu, et al (2025)

An independent samples t-test was conducted to compare the mean responses of teachers and trainee teachers. The results are shown in Table 3 since the calculated t-value (44.93) is greater than the critical t-value ( $\pm 1.97$ ) at 0.05 level of significance. Therefore, the null hypothesis is rejected. This indicates that a significant difference exists between teachers and trainee teachers in their perception of the effectiveness of computer technology integration in teacher education institutions in South West, Nigeria. Teachers perceived computer technology integration as significantly more effective than trainee teachers. The statistically significant difference indicates that teachers perceive the integration of computer technology in teacher education institutions as far more effective than trainee teachers do. This disparity may be attributed to teachers' greater exposure to instructional technologies, professional experience, and familiarity with the practical application of computer tools in pedagogical processes.

In contrast, trainee teachers may have limited hands-on experience or may still be in the process of developing confidence and competence in the use of educational technologies, which could influence their lower perception ratings. The large t-value further suggests a substantial gap in perception, highlighting the need for intensified practical training and targeted technology integration support for trainee teachers within teacher education programmes.

H<sub>02</sub>: There is no significant difference in the perceptions of computer technology integration between teachers and trainee teachers in teacher education institutions in southwest, Nigeria.

**Table 4:** A t-test analysis comparing the mean responses on the significant difference in the perceptions of computer technology integration between teachers and trainee teachers in teacher education institutions in southwest, Nigeria.

Group	N	Mean	SD	df	t-cal	t-crit	Sig
Teachers	150	3.59	0.66	280	28.05	1.97	0.05
Trainee Teachers	150	1.50	0.63				

**Decision:** p, 0.05 - Reject H<sub>0</sub><sup>2</sup>

**Source:** Dawodu, et al (2025)

An independent samples t-test showing mean response of the perception of computer technology integration between teachers and trainee teachers in teacher education institutions in southwest, Nigeria. The table 4 shows that the calculated t-value (28.05) is greater than the critical t-value ( $\pm 1.97$ ) at the 0.05 level of significance. Therefore, the null hypothesis is rejected. This indicates that there is a statistically significant difference in the perceptions of computer technology integration between teachers and trainee teachers in teacher education institutions in South West, Nigeria. Teachers demonstrated significantly higher perception scores than trainee teachers.

### Discussion of Findings

The findings from this study show a clear and statistically significant difference between teachers and trainee teachers in on how they perceive the computer technology integration in teacher education

institutions in South West, Nigeria. The calculated t-value of 28.05, which is well above the critical value of  $\pm 1.97$ , led to the rejection of the null hypothesis. In simple terms, this means that teachers view computer technology integration far more positively than trainee teachers. This gap suggests that the two groups differ in their levels of experience, exposure and confidence when it comes to using digital tools for teaching. Teachers' more favorable perceptions may stem from their daily involvement with technology in real classroom situations. As practicing educators, they frequently use various digital tools and platforms, which helps build their confidence and strengthens their belief in the value of technology for teaching (Teo, 2011; Koehler & Mishra, 2009). Their engagement in professional development activities and their familiarity with applying technology to instructional tasks further reinforce these positive attitudes (Mishra & Koehler, 2006).

On the other hand, trainee teachers reported much lower perception scores. This may be because they have fewer opportunities to work directly with technology in teaching situations during their training. Prior research shows that many pre-service teachers face obstacles such as limited access to ICT resources, low digital literacy, and insufficient practicum experiences that involve meaningful technology use (Agyei & Voogt, 2012; Olatoye & Adekoya, 2010). These limitations can weaken their confidence and negatively shape their views on the effectiveness of digital technologies in teaching. This study explored the perceptions of teachers and trainee teachers regarding the effectiveness of computer technology integration in teacher education institutions in Southwest, Nigeria. The results offer valuable insights into ongoing efforts to digitize teacher preparation and highlight important differences in how various stakeholders experience and interpret technology integration in educational settings. Overall, both teachers and trainee teachers rated technology integration as moderately effective. This suggests that while institutions are making progress in adopting digital tools, many efforts remain fragmented and under-supported.

These findings are consistent with Adedeji and Oyelami (2021) and Afolabi and Ayeni (2023), who also noted that although technology is increasingly prioritized in education policies, actual implementation remains slow due to infrastructural challenges, funding limitations, and inconsistent institutional support. One of the key findings is the significant perceptual difference between teachers and trainee teachers. Trainee teachers many of whom belong to the digital-native generation tended to

hold more positive views about technology integration. This could be due to their prior exposure to technology in academic and social contexts and may suggest that age and familiarity with digital tools play a crucial role in shaping attitudes. In contrast, some teachers, particularly those who may not have grown up with such technologies, may find digital tools intimidating or cumbersome, leading to lower confidence in their use. This generational divide aligns with Davis' (1989) Technology Acceptance Model (TAM), which asserts that perceived ease of use and perceived usefulness strongly influence individuals' acceptance of technology. Trainee teachers likely perceive digital tools as both useful and easy to use, resulting in higher acceptance and adoption rates. Teachers with limited technological training may struggle to internalize these benefits, reinforcing the need for continuous professional development that addresses both skill gaps and attitude shifts.

Institutional differences were also revealed as a major factor. Respondents from institutions with better infrastructure, trained ICT personnel, and clear policies on digital integration reported higher levels of satisfaction with technology use. This outcome supports Osei-Bonsu's (2022) conclusion that unequal access to resources leads to variable ICT adoption in teacher education institutions. It further underscores the systemic inequities that exist within educational systems. These differences have significant implications for students' learning experiences and the readiness of future teachers to work in digitally enabled classrooms.

The findings of this study reinforce the key tenets of both the Technology Acceptance Model (TAM) and the Technological Pedagogical and Content Knowledge (TPACK) framework. TAM is supported by the evidence of differences in perception based on ease of use and usefulness, especially between trainee teachers and experienced teachers. Similarly, the findings affirm the assumptions of the TPACK framework, which views successful technology integration as dependent on intersecting knowledge domains. The inability of some educators to harmonize their pedagogical and technological skills may be due to insufficient training or support, suggesting that TPACK competencies must be systematically developed through pre-service and in-service training programmes.

## **Conclusion**

This study concludes that the integration of computer technology in teacher education institutions across Southwest Nigeria is moderately effective, suggesting that while significant strides have been

made, considerable room for improvement still exists. The findings revealed perceptual differences between teachers and trainee teachers, with trainee teachers often more optimistic about the benefits of technology due to their ongoing exposure to digital tools during training. Conversely, many practicing teachers expressed concerns about limited institutional support and the practical relevance of available resources. These differences in perception are consistent with earlier studies, such as Yusuf and Balogun (2021), which noted the varying levels of digital readiness among teacher cohorts. Additionally, this research identified disparities among teacher education institutions in terms of infrastructure, training opportunities, and overall support for computer technology integration. While some institutions have improved access to digital tools, others continue to struggle with outdated equipment, irregular power supply, and insufficient ICT training a situation that undermines effective implementation (Adeyemi & Ogunlade, 2022). These systemic challenges highlight a persistent gap between policy and practice. Although national frameworks such as the National ICT in Education Policy (2019) provide a structure for integrating digital tools in teacher preparation, inadequate funding and poor enforcement remain persistent issues (Federal Ministry of Education, 2019). In conclusion, the moderate level of effectiveness observed in this study signals that progress has been made, but it is far from sufficient. For computer technology integration to achieve its full potential in teacher education, strategic investments in infrastructure, continuous capacity development, and stronger policy implementation mechanisms are urgently needed. Without these measures, teacher education institutions may continue to lag behind global standards, thereby affecting the quality of teaching and learning in Nigerian schools.

### **Recommendations**

1. **Improve ICT Infrastructure:** Government and institutions should invest in modern computer laboratories, stable internet, and digital teaching tools for the preparation of the trainee teachers.
2. **Strengthen ICT Training:** Regular workshops should be mandatory for trainee teachers.
3. **Enhance Institutional ICT Policy Implementation:** Clear monitoring mechanisms should be established in teacher institutions.

4. Promote Digital Competence Development: Teacher education curricula should embed more practical ICT components.
5. Provide Technical Support: Teacher institutions should establish ICT help centres to support trainee teachers.
6. Ensure Equitable Resource Distribution: Disparities between teacher institutions and other conventional institutions should be addressed.

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