

**PRE-SERVICE TEACHERS' AWARENESS, READINESS AND UTILIZATION OF  
DIGITAL PLATFORM FOR PROFESSIONAL DEVELOPMENT IN A NIGERIAN  
UNIVERSITY**

**BY**

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## **ABSTRACT**

This study Pre-Service Teachers' Awareness, Readiness and Utilization of Digital platform for professional development in Nigerian University. Survey Research Design was used to carry out the Education of Pre-Service teachers in Nigerian university. The Survey instrument were chosen using random sampling techniques. Questionnaire was used as instrument for data collection and intend to answer the research questions. The Data collected were analyzed using Mean and Standard Deviation to answer the research questions while t- test statistics to analyzed Pretest and Post-test scores. The results indicated that more than 60.7% of Teachers out the total respondent agrees that Awareness, Readiness and Utilization of Digital platform for professional development in faculty of education of the Federal University of Technology, Minna Niger state will enhance the teaching and using Digital platform. Its therefore concluded that; The level of pre-service teachers' awareness of digital platforms for professional development in FUT Minna is high. The level of preservice teachers' readiness of digital platforms for professional development in FUT Minna is high. It was therefore recommended that There is a need to intensify the awareness on digital platform for professional development among pre-service teachers, Pre-service teachers should be encouraged to utilize digital platform for professional development

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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the Study

Information and communication technology (ICT) has grown, and ICT tools have become more accessible and effective in meeting everyday demands. This usefulness has expanded from supporting conventional jobs to significantly assisting many areas such as education, health, government, and business. A rising number of studies continue to analyse and dispute the influence of ICT on learning outcomes, owing to its perceived role in education. Thus, developments in ICT have altered the dynamics of how teaching and learning are fostered (Sinha & Bagarukayo, 2019). E-learning allows people to work and learn at the same time, which is an upgrade over the traditional distance learning programme of study (Owolabi & Owolabi, 2015). Classroom learning is limited to memorization, passive listening, and theoretical rather than actual learning. As a result, the quest for a digital platform will enhance student participation.

Akingbe (2014) defines digital technologies as tools and strategies used to assist and engage learners in the twenty-first century; an array of technologies with numerous benefits such as reduced teacher preparation time, bringing life (interaction) into instruction, and eliminating writing challenges. Digital technology allows for a rapid improvement in student performance. Digital technologies provide tools for planning, presenting, and interacting with others. According to Desjardin *et al.* (2017), digital technologies pervade all human activities and force everyone to continually adjust to reality, especially as technology advances and makes demands in the classrooms.

According to Sauban and Baharaddin (2016), there is a paradigm shift from the age-old traditional teacher-centred method to learner-centred learning, in which students construct their learning and where the use of digital technologies produces better results in learners than the traditional method. The incorporation of digital technologies into education is positioned as a vehicle for educational reform through the change of teaching practice (Hammond, 2013). Digital technologies have been prioritised in the education programmes of many countries, both developed and developing, due to their recognised potential for learning support and the development of learning skills, competencies, and proficiencies (Hernández, 2017; Muralidharan, Niehaus & Sukhtankar 2017; Yilmaz, 2016).

Professional development is a deliberate and methodical process that ensures teachers' development and continuous self-improvement (Oluremi, 2013). Professional development, according to Fareo (2013), is the advancement of a person in his or her professional function. Professional development is essential for all scientific instructors due to the multiple benefits it provides to both lecturers and student teachers.

Professional development increases and improves teachers' teaching skills. Teachers can improve their topic knowledge and teaching skills through professional development practice; it also aids in adjusting to the introduction of a new curriculum and new research results on teaching and learning (Agharuwhe, 2013). Thakur (2014) highlights that while teacher education is aimed at preparing teachers, the quality of teacher education is dependent on the competencies and capabilities of the teacher trainers.

Nigeria's pre-service teacher education programme aims to develop teachers with strong personal and professional discipline, as well as awareness of suitable pedagogical knowledge and abilities to help students learn (FRN, 2012). The Minimum Standards go on to state that teachers must:



professionally combine traditional and ICT or other innovative instructional strategies in generating and imparting knowledge, attitudes, and skills at the elementary level; and develop, select, and effectively use appropriate curriculum processes, teaching strategies, instructional materials, and methods for maximum learner achievement.

To meet this objective, pre-service teachers' awareness, readiness and utilization must be considered, because positive or negative perceptions might influence pre-service teachers' attitudes and preparedness to use digital platforms for learning. According to Skeels and Grudin (2016), favourable student attitudes and behaviours toward online learning are vital and necessary for the acceptance and adoption of digital platforms. Their computer experiences, which include obvious self-usage, satisfaction, and efficacy, as well as the utilisation of digital platforms, play a dominant role.

Awareness of digital technologies includes understanding what types exist, why they exist, and how to use them successfully. According to Reiner (2017), digital awareness is much more than knowing how to use technology or a computer; it is the ability to understand and apply technology in an increasingly interconnected world, especially now that technology has made the world smaller. According to Leah (2018), awareness allows teachers to use skills in the classroom, which fosters a strong feeling of digital citizenship in contemporary society. Cassa (2014) further explains that teachers make the best use of digital technologies by increasing their awareness of a variety of digital technologies and carefully considering why and how they might be used to help students learn. In other words, teachers who are familiar with digital technologies are more likely to engage pupils in classrooms where 21st-century tools are used. Teachers who are digitally aware will be able to access, manage, interpret, evaluate, and provide various types of information to

their students, allowing them to function effectively in a knowledge-based society by developing critical thinking, problem-solving skills, and the construction of their learning.

Readiness has been defined as the point at which a person is ready to learn and the period when a person transforms from being a non-reader to being a reader. Early literacy and emergent reading are two more synonyms for preparation. Cagiltay *et al.* (2016) defined readiness as an individual's mental and physical preparedness for electronic teaching and learning. According to Tang and Lim (2013), for a certain technology to be implemented in teaching and learning, stakeholders' readiness must be in place. The concept of readiness is critical in the integration and adoption of digital technologies. Karen *et al.* (2015) studied pre-service teachers' readiness to integrate technology with cross-curricular adaptations. Pre-service teachers prepared to teach in 21st-century classrooms must grasp the need for increased student engagement, improved critical thinking, and real-world application. Furthermore, the findings support the notion that pre-service teachers believe that technology can and should be easily adopted in future classrooms, and as a result, they are willing to adopt technology and digital platforms. Several studies have found that pre-service teachers are eager to use digital platforms (Tang & Lim, 2013; Cigdem & Yildirim, 2014).

Utilization refers to the actual use of digital tools for instructional planning, presentation, collaboration, and learning evaluation. These three processes have become very important and desirable for effective teaching and learning in the twenty-first-century for teacher education. This is because we live in a time when teachers serve as a support system for learners, allowing them to design their learning through the use of a variety of digital technologies proven effective in teaching and learning. It is also claimed that the usage of digital technologies will not only improve student learning but will also aid in the achievement of long-term education. The perceived benefit

of ICT technologies such as electronic response systems encouraged the usage of such technology in education. The use of this technology breakthrough in learning circumstances will make learning more engaging for students and teaching easier for teachers, as well as establish a viable teaching-learning environment (Azimi, 2013). Gender imbalance in computer use, access, career, and attitude could be addressed by frequent use and continual learning of ICT knowledge and skills.

As a result, in order to carry out the teaching and learning process successfully, pre-service teachers must be knowledgeable, prepared, and use digital technology. The importance of being aware of digital technology to support students' learning cannot be overstated. According to Amutha and Kennedy (2015), teachers' knowledge of digital technologies in the teaching and learning process, solving challenges, and building capacities, among other things, is critical. This is due to the teachers' use of a variety of innovative pedagogical tactics in their class delivery, which includes the use of digital technology by pre-service teachers, resulting in overall development and growth in society.

Despite the obvious benefits of digital platforms in the teaching-learning process, their awareness, readiness, and utilisation are rather low. It is against this backdrop that the researcher wishes to investigate pre-service teachers' awareness, readiness, and utilisation of digital platforms for professional development in a Nigerian university.

## **1.2 Statement of the Problem**

Students of the twenty-first century have been referred to as digital natives. Students nowadays (including educational students) seek a more ICT-based technique of teaching and learning rather than the old method. It has been noted that in this day and age, the average educational student

spends more time on the internet, particularly social networking sites, than on books. The researcher observed that students currently use web technology more frequently in their daily activities. This study is motivated by the need to overcome infrastructure deficiencies and limited access to high-quality higher education.

Digital platforms are widely utilised for uploading and downloading digital content. Online learning, e-learning, and mobile learning have all been promoted as digital platforms. The successful incorporation of digital technology into professional development will be dependent on pre-service teachers' awareness, readiness, and utilisation. As a result, pre-service teachers' positive or negative awareness and willingness may lead to the use of digital platforms. Teachers' lack of understanding and readiness, on the other hand, may result in inadequate integration of digital platforms. Furthermore, Niger State, where the study will be conducted, is in North-central Nigeria, which has been ravaged by bandit attacks and has placed many in refugee camps; hence, the use of digital platforms may be the best choice. The findings of this investigation could provide valuable information on the subject. As a result, this study intends to investigate pre-service teachers' awareness, readiness, and utilisation of digital platforms for professional development in universities in Niger State, Nigeria.

### **1.3 Aim and Objectives of the Study**

The aim of the study is to investigate the preservice teachers' awareness, readiness and utilization of digital platforms for professional development in a Nigerian University. Specifically, the study achieved the following objectives; to

- i. determine the level of preservice teachers' awareness of digital platforms for professional development in a Nigerian University.

- ii. examine the preservice teachers' readiness for digital platforms for professional development in a Nigerian University.
- iii. examine the preservice teachers' utilization of digital platforms for professional development in a Nigerian University.

#### **1.4 Research Questions**

The study provided answers to the following research questions;

- i. What is the level of preservice teachers' awareness of digital platforms for professional development in a Nigerian University?
- ii. To what extent are pre-service teachers' ready to use digital platforms for professional development in a Nigerian University?
- iii. Area preservice teachers utilizing digital platforms for professional development in a Nigerian University?

#### **1.5 Research Hypotheses**

The following research hypotheses were postulated for the study;

H<sub>01</sub> There is no significant difference in preservice teachers' awareness of digital platforms for professional development based on gender.

H<sub>02</sub> There is no significant difference in preservice teachers' readiness for digital platforms for professional development based on gender.

H<sub>03</sub> There is no significant difference in preservice teachers' utilization of digital platforms for professional development based on gender.

## **1.6 Significance of the Study**

The findings of this study will be of great benefits to pre-service teachers, university administration, policymakers and future researchers. It is envisaged that the findings would have an academic impact on pre-service teacher education. It is hoped that this research, by providing a greater understanding of pre-service teachers' usage of digital platforms, would serve as a roadmap for improving teacher education in universities, which will benefit both teacher educators and pre-service teachers. This study will not only give information to educators, university administration, policymakers, and technologists, but it may also be valuable in guiding institutions in their research and development framework related to ICT literacy and capacity building in education and training. The research findings are expected to have both practical consequences for present pre-service and in-service teachers, as well as policy implications for universities and future teacher education. The finding of this study will also add to the existing literature on pre-service teachers' awareness, readiness and utilization of digital platforms for professional development.

## **1.7 Scope of the Study**

This study will be delimited to the the preservice teachers' awareness, readiness and utilization of digital platforms for professional development in a Nigerian University the respondents of the study were pre-service teachers in Federal University of Technology Minna. The variables of the research design that will be employed in this study is a descriptive survey.

## **1.8 Operational Definition of Terms**

**Pre-service teachers:** refer to students in the Faculty of Education who are undergoing teacher training in Federal university of Technology, Minna

**Awareness:** refers to the pre-service teachers knowledge of existence of digital platforms for the professional development.

**Readiness:** refers to the preparedness of pre-service teachers to perform and discharge duties by using digital platforms.

**Utilization:** refers to the intention of pre-service teachers to use digital platform for professional development.

**Digital technology:** refers to information technologies that enable access to education used for professional development among pre-service teachers.

## **CHAPTER TWO**

### **REVIEW OF RELATED LITERATURE**

#### **2.1 Introduction**

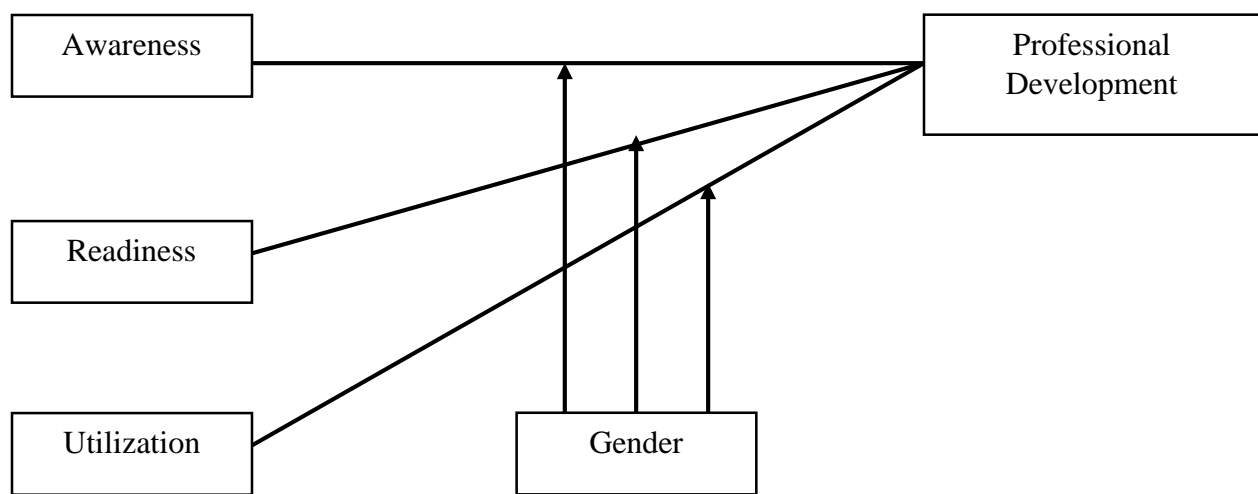
The aim of this study is to investigate the preservice teachers' awareness, readiness and utilization of digital platforms for professional development in a Nigerian University. In light of this, this chapter aims to review the current literature related to the study under the following heading.

- 2.13 Conceptual Framework
- 2.14 Theoretical Framework
- 2.15 Concept of Preservice Teachers
- 2.16 Concept of Digital Platforms



- 2.17 Concept of Professional Development of Teachers
- 2.18 The development of the Nigerian Education and Teacher Education System
- 2.19 Digital Platforms and Pre-service teachers' professional Development
- 2.20 Preservice Teachers Awareness of Digital Platform for Professional Development
- 2.21 Preservice Teachers Readiness of Digital Platform for Professional Development
- 2.22 Preservice Teachers Utilization of Digital Platform for Professional Development
- 2.23 Summary of the Reviewed Related Literature

## 2.2 Conceptual Framework



**Figure 1: Researcher Developed Conceptual Framework (2023)**

The conceptual framework shows the connections between three categories of variables namely the dependent, moderated and independent variables. The independent variables are the preservice teachers awareness, readiness and utilization in Nigerian University, the moderated variable is the gender while the dependent variable of this study is the Professional Development (PD) of preservice teachers in Nigerian university. However, the independent variables and the moderated variable are expected to influence the dependent variable.

### **2.3 Theoretical Framework**

This study which is titled “Pre-Service Teachers' Awareness, Readiness and Utilization of Digital Platform for Professional Development in a Nigerian University” was anchored in the theory of connectivism. Connectivism theory is considered most appropriate to the present study as it involves the integration of digital technologies into educational pedagogy with a view to making teaching and learning more vibrant, accessible and cost-effective. Connectivism theory is one that explains the utilization of technology in education. It is a pedagogical approach that afford learners the opportunity of connecting with one another via technologies, internet networks and teamwork tools. Connectivism is an epistemological approach grounded in the interactions within networks (Downes, 2012).

Thus, since connectivism theory sees learning as a process of connecting information sources or specialised nodes for knowledge acquisition and information sharing, it, therefore, has direct application to the present study. Downes studied connective knowledge and characterised it as interactive knowledge of a connection within a network (Downes, 2005). Connectivism, therefore, is seen as a network theory for teaching and learning in a connected world (Bell, 2009). Siemens (2004) suggested connectivism as a learning theory for the digital age. Siemens further posited

that connectivism is a theory that succeeds the earlier learning theories of behaviourism, cognitivism and constructivism.

The concept of network is prominent in the theory of connectivism that characterises knowledge as a flow through a network of humans and non-humans (artefacts). A network comprises connections between entities (nodes), where the nodes can be individuals, groups, systems, fields, ideas, resources or communities. Online learning has a long history reaching back to the first online technologies such as electronic mail and computer conferencing systems, and this formed the basis of modern digital education also known as e-learning. Siemens (2004) summarises the main principles of connectivism thus:

- Learning and knowledge rests in diversity of opinions.
- Learning is a process of connecting specialised nodes or information sources.
- Learning may reside in non-human appliances.
- Capacity to know more is more critical than what is currently known.
- Nurturing and maintaining connections is needed to facilitate continual learning.
- Ability to see connections between fields, ideas, and concepts is a core skill.
- Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
- Decision-making is itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

Consequently, Siemens and Downes further stated that connectivism proposes that knowledge is distributed across a network of connections, and, therefore, learning consists of the ability to construct and traverse those networks. The attractiveness and accessibility of the theory of connectivism makes it a good option for structuring innovation by educators in their practice. One implication of students becoming connected learners is that learning will neither be confined to the physical classroom nor to the virtual classroom, within the institutional virtual learning environment (Barnett, *et al*, 2013). This implies that students and teachers do not necessarily need to be in the same place for teaching and learning to take place. Students can be engaged as they acquire the 21st-century learning skills that are needed to make effective use of technologies that are emerging for use within classrooms and the workplace (Educause, 2008).

Another benefit of connectivism, according to Cormier (2008), is that it permits a community of people (working with learning technologies) to legitimise what they are doing. Educators wishing to extend the use of social media within their practice can refine and spread knowledge more quickly through membership of multiple online communities. Another implication of connectivism is that educational resources are open and available to use, often with Creative Commons Licenses that permit sharing, creating and remixing media (Bell, 2009).

According to Bell (2009), the following six steps will help any educator/teacher who wishes to adopt connectivism theory to achieve effective results in any form of online education:

- Follow the blogs of those who innovate/advance with educational technologies.
- Experiment (within your comfort zone) with web services and tools that might enrich teaching and learning in your practice.
- Use, publish and share resources through blogs, wikis, photo and video sharing sites.

- Encourage students to use the web for scholarly resources — being critical and selective, and attributing sources.
- Assign students, activities that empower effective use of media to report process and, where appropriate, outcomes.
- Make explicit the concept of connectivism in student support activities so that they can exploit it in their own independent learning.

Thus, from the foregoing, we can truly see that the theory of connectivism had a direct bearing with the present study, which is anchored in the preservice teachers awareness, readiness and utilization of digital platform for professional development in Nigeria university. Thus, for preservice teachers to actively apply digital technology quality instruction and learning interactions in Nigerian universities, the requisite ICT (digital) facilities must be made available in the universities. Also, preservice teachers must be aware and ready to utilize the digital platform for professional development.

#### **2.4 Concept of Preservice Teachers**

Pre-service teacher training is a set of educational programmes designed to prepare future teachers to enter the profession at a certain level of education. Teachers who do not fulfill officially recognized training criteria and enrolled in a teacher training school to achieve accreditation while working as a teacher are not covered by pre-service training (UNESCO, 2021). Students' practice teaching is a practical teaching activity in which student-teachers are given the chance to display and enhance their pedagogical abilities in a real-world setting over a certain period of time. Pre-service teachers are required to go to schools for practice teaching under the supervision of a superior teacher in order to get the experience needed to qualify as a teacher.

In this regard, pre-service teachers are typically expected to be responsive to their own abilities, know the names of students, practice approach, methods, and procedure, successfully manage the teaching-learning process, use time effectively, have communication skills, acquire classroom management skills, carry out assessment and evaluation, and manage inappropriate student behaviours in the context of the teaching-learning process of the practice teaching internship.

Practice teaching, according to Francis, Philip, and Francis (2017), helps pre-service teachers gain understanding and interest in teaching, as well as personal development skills such as decision-making, critical thinking, increased self-confidence and self-esteem. Planning, teaching, watching, and positive criticism are all part of microteaching. Teaching, feedback, re-planning, reteaching, and re-feedback are five steps that can be included (Putri, Ferlya & Yusnita, 2018).

Furthermore, by combining theory and practice, the micro-teaching session organizes the model for preservice teachers and builds their confidence in teaching (Ismail, 2011). Furthermore, pre-service teachers will gain additional practical experience in the micro-teaching class in addition to learning and reflecting on various teaching strategies. Pre-service teachers benefit from microteaching because it gives them valuable teaching experience and helps them understand the benefits and connections between theory and practice. Microteaching is also set up as a safe training environment where pre-service teachers can practice their teaching skills before taking over the actual classroom.

Pre-service teachers are posted to schools to conduct real teaching in the classroom after completing the microteaching course. This internship is classified as a teaching internship. Preservice teachers are exposed to real-world classroom situations in which they are required to demonstrate their knowledge of teaching, socialising, negotiating, and other managerial skills. Preservice teachers' training is a crucial period in which they gain their first teaching experience,

which they will use throughout their career. Pre-service teachers can gain desired experiences by conducting teaching practise in a real classroom setting. The practise school is the ideal location for practising teaching (Shafqat & Muhammad, 2015). This environment is used to familiarise pre-service teachers with their teaching professions, schools, teachers, and students. Duties, obligations, and reciprocal expectations exist between pre-service instructors, teachers, school officials, and students.

## **2.5 Concept of Digital Platform**

Technology experiences many of innovations from before simple (mechanical) to more advance (microelectronic). The advanced technology that humans use today is technology that controlled by microchip components. The part has program by humans as needed through systematic logic lines in the structure of the algorithm. With the microchip part, electronic devices could be formed in a portable and mobile way. The microchip part which functions to process and process digital signals. Digital is a combine of sequences of binary numbers 0 and 1 for easy, fast and accurate information processing. The signal called a "bit" of digital technology that has several features compared to analog technology:

1. Being able to send information at the speed of light that makes information can send at high-speed (instant).
2. Repeated use of information does not affect the number of information itself.
3. Information can easily process and modified into variousforms.
4. Can process very large amounts of information and sent it interactively (Hoyles & Lagrange, 2019).

The development of digital technology today has brought changes and influenced various aspects of human life, including in the field of education. Hoyles and Lagrange (2019) asserted that digital technology is the thing that most influences the education system in the world today. This is due to the effectiveness, efficiency and attractiveness aspects offered by digital technology-based learning.

Information and communication as part of digital technology are also developing very rapidly, affecting various lives and providing changes to the way of life and everyday human activities, including in the world of education. Education is experiencing very rapid development as well, including the exist of digital platforms (digital learning). By utilizing the develop of information and communication technology, education can reach all levels of society. People with an interest in education are must to have been ability to understand technology according to their needs or technological literacy which is also called to have technological literacy, because it will play a role in life now and in the future. As a result, in the world of education in the present and the future there are several trends including a learning system that is increasingly developing with the ease of organizing education (Hoyles & Lagrange, 2019).

## **2.6 Concept of Professional Development for Teachers**

Professionals need to learn from experience, to update their competence, and ensure that their knowledge, skills, and understanding are also up to date. Pedagogical transformation of the teacher can be facilitated through on going teacher professional development which enables them to reflect on their own practice and improve their professional practice through interaction with other practitioners (Sari, 2012). Phenomenon about teachers' engagement in professional development has stressed the relationship between professionalism and teachers' professional development. Professionalism requires professional knowledge, competence, and expertise and the key concept



for this professionalism is successful policies and strategies of professional development (Al-Hinai, 2007).

In other words, professionalism is linked to and developed through professional development. Professional development is a medium for teachers to develop their knowledge and skills in teaching. The notion professional development refers to a process where teachers review, renew, and extend their commitment as change agents to the moral purposes of teaching, as well as acquire and develop the knowledge, skills, plan, and practice with children, young people, and colleagues through each phase of their teaching lives with concepts of learning, engagement, and improved practice (Bredeson, 2002). Teacher professional development should aim at enhancing the knowledge and skills of teachers by means of orientation, training, and support which contribute to the improvement of the quality of the learning and teaching process and focusing on teacher core competencies such as improving teacher proficiency, understanding the students, managing practice of teaching skills, comprehending the other branches of knowledge as well as knowing and appreciating the teaching profession (Tanang et.al., 2014).

A wellorganized professional development program from its planning, process, and evaluation will be a benefit for the participating teachers. A successful learning program will bring a change in the way teachers conduct their duties and keep the status as professional. Teacher professional development program which designed with content focus, active learning approach, sufficient time to reflect, connected to policies and curriculum, and collaborative participation can maximized teachers' learning (Tanang & Abu, 2014). Many literatures have identified principles of teacher professional development and in order to establish it effectively and successfully, the program is dependent on these principles.

According to Lessing and De Witt (2007), there are three aspects included in the principles namely workshop, programs' personal values for teachers, and teachers' teaching approach. Further, they specify the principles of teacher professional development as follow:

- i. It should address specific needs of teachers and activities provided should be able to support teachers in applying the knowledge and teaching methodology.
- ii. It should be a continuous process and contribute to the improvement of education.
- iii. It should cater teachers' diversity so that their needs can be met.
- iv. It should enable and support teachers, and provide instruction to gain competence, confidence commitment and sense of the joy of teaching.
- v. It should give teachers opportunities to apply their newly acquired knowledge in practice.
- vi. It should have assessment as an integral part of the program and give chance for teacher to discuss with others what has been done.

Hadi (2002) adds aspects such as teacher's existing knowledge and beliefs, learning in the classroom practice, teachers as learners, learning subject and pedagogical content knowledge, as well as time and support given for teachers during teacher professional development program are also among the principles. Successful teacher professional development program should give teachers opportunities to do learning to teach and enables them to improve their expertise through all kinds of means, media and methods. Attempts to support teachers' learning must realize that teachers' knowledge and beliefs about teaching, learning, learners, and subject matter play critical role in determining how they implement new instructional ideas.

Further, teacher must be given opportunities to learn and reflect about new instructional strategies and ideas in the context of their own classroom practice for it contribute to the development of teachers' knowledge and skills. They also should be given experiences with teaching approaches

that are similar to those to be used in the classroom. In order to be successful in teaching, teachers should have deep and broad understanding of the subject. They should be provided with opportunities to enhance their knowledge of subject matter. Sustained time and support also must be provided for reflection, collaboration, and continued learning (Borko & Putnam, 1996).

Teacher professional development program also should enable teachers to work with other colleagues to create organizations that support learning. They have to be given a chance to be a member of community of practitioners, sharing knowledge and commitments, working together with the community members to create coherent curriculum and systems to support students, and collaborate with them in ways that advance teachers' understanding and skills. These features are important because teaching profession is complex. It demands its professionals to know much on how to achieve their goals for students in unpredictable and non-routine situations. They should be able to put their understanding in practice and continue to learn from their colleagues in order to face new challenges (Darling-Hammond & Bransford, 2005).

Professional development should be a continuous process and contribute to the general improvement of education in order to proceed successfully. Studies show that teachers' participation in professional development activities gave positive impacts on teachers' beliefs and practices as well as students' performance in learning and on educational reforms in general (Tanang & Abu, 2014). Professional development program should include relevant activities such as improvement on teacher qualification, updating teachers' knowledge and understanding of their teaching subject, practicing to teach students with different background, developing practical competences and skills, learning new teaching methodologies, employing learning innovations and technologies, improving professionalism in ethics, as well as providing knowledge and skills to anticipate changes in society (Perraton *et al.*, 2002) in order to give positive impact to teachers,

students' performance and educational reform. Investing in teacher professional development programs and activities is crucial for teachers as well as for the teaching and learning process. It is important for teachers to strengthen their knowledge base to accomplish their educational duties and meet their educational demands.

Professional development of teachers refers to skills and knowledge attained for both personal development and career advancement. Professional development encompasses all types of facilitated learning opportunities, ranging from college degrees to formal coursework, conferences and informal learning opportunities situated in practice. It has been described as intensive and collaborative, ideally incorporating an evaluative stage. There are a variety of approaches to professional development, including consultation, coaching, and communities of practice, lesson study, mentoring, reflective supervision and technical assistance.

Student achievement is linked to numerous factors, but quality teachers are one of the most important components of student success. If school teachers do not have the tools they need to teach students effectively, their students will suffer. To teach effectively, teachers need access to ongoing teacher professional development. This professional development enables teachers to improve their own education through seminars, workshops, and classes.

Through teacher professional development, teachers learn new teaching strategies to improve the quality of instruction. This allows them to make changes in the way they teach their students, incorporating innovative teaching methods in the classroom. It teaches them how to work with a variety of learning styles, since not all students learn the same way. It also helps teachers change their day-to-day teaching methods, encouraging them to accept new methods based on accurate education research.

Principles for Professional Development should:

- i. Ensure depth of content knowledge.
- ii. Provide a strong foundation in the pedagogy of particular disciplines.
- iii. Provide more general knowledge about teaching and learning processes, and about schools and institutions.
- iv. Reflect the best available research.
- v. Contribute to measurable achievements in student learning.
- vi. Expect teachers to be intellectually engaged with ideas and resources.
- vii. Provide sufficient time, support and resources to enable teachers to master new content and pedagogy and integrate these into their practice (American Federation of Teachers, 1995).

## **2.7 The development of the Nigerian Education and Teacher Education System**

Although the historical accounts of teacher education development in Nigeria vary somewhat, there seems to be a consensus that formal education and teacher education developed concurrently in Nigeria (Ogunyinka *et al.*, 2014). Prior to the arrival of the missionaries and the beginning of colonial rule, Nigeria, especially in the South, practiced what Fafuwa (1982) referred to as African traditional Education. African traditional education ‘emphasised social responsibility, job orientation, political participation, spiritual and moral values’ (Fafunwa, 1982). The purpose was to pass to the youths and children, the knowledge, skills and attitude they required to successfully and completely integrate into the community (Mosweunyane, 2013). During this time, teachers were mostly the parents and elders of the family and the method of teaching was mostly through story telling (Mosweunyane, 2013).

The key feature of this education was the apprenticeship model in which ‘children learnt by doing’ (Fafunwa, 1982). There was neither a systematic method of teaching nor an official curriculum; hence, knowledge was passed on to the youths based on the value and culture of the society. In the North, Islamic schools were dominant. These schools existed in the North even before the arrival of missionaries in Nigeria (Fafunwa, 1982). Islamic schools focused on teaching the tenets of Islam to the Muslim youths and are found within and outside the mosque (Fafunwa, 1982). Like the African traditional education, there was no systematic method of teaching. The youths and children learned by memorising and reciting the verses of the Quran after their teacher, a method that would be referred to as today as ‘rote learning’.

Fafunwa (1982) further noted the difference in the structure of the Islamic school system. He pointed out the different levels of progression from reciting the Quran, to learning the Arabic alphabets and then to writing and reading them in the Arabic language. This suggested that ‘Islam with its Arabic influence was already firmly established in the Northern part of Nigeria’ even before formal education started in Nigeria (Ukeje & Asiku, 1982). Notwithstanding the existence of Islamic education in the North, it is argued that formal education in Nigeria can be traced to the arrival of the Christian missionaries in 1842 (Ogunyinka *et al.* 2015). They settled in the southern part of Nigeria, as the Northern part was already dominated by Muslims (Ukeje and Asiku, 1982). Fafunwa (1982) noted that at this time that the main purpose of education was to ‘propagate the gospel... and [to] win souls for Christ’.

Hence, they needed teachers who would help them preach to the local people. Ayodele and Akindutire (2009) argued that the need to train individuals who would preach in the missions gave rise to teacher education in Nigeria. The first three teacher education institutions in Nigeria were established by the Church Missionary Society (CMS), the Baptist Mission and the Wesleyan

Methodist Missionary Society, respectively. The Church Missionary Society (CMS) established the training institution in 1859, which is currently known as, Emmanuel Alayande College of Education, Oyo (Ogunyinka, *et al.*, 2015). In 1897, the Baptist Mission founded the Baptist training college, currently known as the Nigerian Baptist Theological Seminary in Ogbomosho; and in 1905, the Presbyterian Church of England started the Hope Waddell Training Institute in order to train young primary school leavers in various trades, as well as preparing teachers and preachers (Fafunwa, 1974). The main requirement for admission into the early teacher training institutions is a Standard IV (currently equivalent to Senior Secondary School) certificate (Ogunyinka *et al.*, 2015).

However, the prospective students ‘must have served as a pupil-teacher for two years, passed the pupilteacher's certificate examination and would then qualify to act as an assistant teacher before starting another two-year training course in a teacher training institution’. Teacher training was done through an apprenticeship system, in which the missionary set up a school in his residence and ‘some of his pupils lived with him as part of his family’ (Ogunyinka *et al.*, 2015). These student teachers served as ‘teacher evangelists’ for the new converts to Christianity (Afe, 2012). At that time, the management and administration of education was solely the responsibility of the missions. The British colonial masters arrived in Nigeria in 1851 (Ukeje & Aisiku, 1982). But as the original purpose of the British Empire in Nigeria was not ‘nation building’ but trade, education of the people was not high on their agenda (Afigbo, 1991).

However, the colonial government 20 years later began to show an interest in education by funding education and granting aids to the mission schools (Fafunwa, 1982). Fafunwa noted a shift of emphasis in the objective of education between the pre-colonial and the colonial periods. He argued that while education was mainly for religious purposes in the pre-colonial era, it became –

in the colonial era – ‘a diluted semi-secular education which emphasized the role of the school in the continued furtherance of colonial interest in Africa’. The Government built the first primary school and the first secondary school in 1899 and 1909 respectively (Ukeje & Aisiku, 1982). Many more schools were built especially in the south because while formal education was fully established in the South of Nigeria, Islamic schools still dominated the north and did not allow the missions free access to the north. However, only the missions produced teachers for these schools as there were no government teacher training colleges at that time.

The first policy on education was published in 1926 in which education was categorised as two years of infant education, six years of primary education and four years of secondary (Ukeje and Aisiku, 1982). This system was, however, criticised as unsatisfactory. Fafunwa (1982) noted that the content and curriculum of this system were ‘conscious and obvious attempt to educate the African away from his culture’. The Phelps-Stoke Commission, an American philanthropic organisation concerned with the religious and educational affairs of Africans, were invited to review the education system at that time (Fafunwa, 1974). They also criticised the organisation and delivery of education in the British colonies in Africa and recommended some interventions. They argued that ‘though the educational facilities in Africa are largely credited to missions...many of the missions have yet to realise the full significance of education in the development of the African People’ (Jones, 1921). The report noted lack of collaboration and coordination among the missions and between the government and the missions, which they argued weakened the quality and effectiveness of education at that time.

The “natives” (a reference of the time relating to the African people/citizens) were neglected and the education activities were not aligned to their needs, especially in terms of career and language. Fafunwa (1982) noted that the quality of education that the British colonial administration were



willing to offer the 'natives' were the 'barest minimum necessary for such auxiliary positions as clerks, interpreters, preachers, pupil-teachers and so on'. He claimed that schools were mainly use to prepare the locals for semi-skilled jobs. In terms of language, the natives' languages were replaced by English language especially for educational purposes. English language as a medium of instruction in Nigeria has been and is still a bone of contention in the Nigerian education system (Jummai, 2012). Literatures on language education have argued that the use of language was a pragmatic response to the complex language issues in Nigeria as a result of multilingual and multiethnicity of the Nigeria population (Jummai, 2012).

As noted in section 1.5.1, Nigerian demographic population is diverse and people move around within the country, and as such the use of a particular language even within the community is inconsistent. Akinnaso (1988) referred to the complexities of language in Nigeria as the 'most enduring legacy of colonisation and religious expansion'. He argued that English language proliferated quickly in Nigeria because 'no personnel or material resources were available in local languages' (Akinnaso, 1988). As the first schools in Nigeria, were Islamic, Christian or colonial schools and there was no one national language for everyone, Akinnaso (1988) argued that it was difficult to do away with English as a language of, not just instruction in schools, but of administration and business even after independence. Following the Phelps-Stoke Commission report and recommendations, Mr Hussey, the first director of education (Fafunwa, 1974) founded a 6-6-1 system called three stages of education.

The first stage comprised of six years of basic education; stage two was another six years of secondary education after which one could find employment; the third stage would provide a one year vocational training for careers such as teaching, engineering, medicine, and other professions (Lewis, 1965). To actualise the last stage of education, Hussey established the Yaba Higher

College where student teachers were trained in one year to become qualified teachers. This would provide the student teachers a ‘Grade 1 teaching qualification’, which was the highest level of teaching qualification at that time. In preparation for independence in 1959, the Sir Eric Ashby Commission was invited to Identify the future high-level manpower needs of the country for the next twenty years. The setting up of this Commission was a landmark in the history of Nigerian educational system as it examined higher educational structure in terms of the needs of the country and was the first official comprehensive review of higher education in the country.

The Ashby Report also prescribed that education was indeed the tool for achieving national economic expansion and the social emancipation of the individual (Daura & Audu, 2015). The commission therefore recommended ‘a two–years advanced teacher training that should be associated with institutes of education in Nigeria’ (Afe, 2012). This was adopted in 1960 and led to the emergence of Advanced Teachers Colleges in Nigeria which have become Colleges of Education today (Afe, 2012). The first Advanced Teachers College were sponsored by UNESCO and the main purpose of establishing them were to produce well-qualified non graduate teachers for secondary school to replace the older well established Grade II2 teachers who were not qualified for the job. The scheme provided teachers with the NCE (Nigeria Certificate in Education), that are of good quality and the right quantity to meet the educational needs as at that time. The number of these colleges gradually increased to cater for expansions in demands for education and qualified teachers (Afe, 2012)

## **2.8 Digital Platforms and Pre-service teachers’ Professional Development**

PD is critical to ensuring that teachers become familiar with new methods to teach contents of different areas, learn how to use digital technologies for teaching and learning and adapt their teaching to shifting school environments and an increasingly diverse student population

(McConnell *et al.* 2012). However, the number of PD opportunities for teachers has increased, the understanding of Lawless and Pellegrino (2007) about what constitutes quality of PD, what teachers learn from it or its impact on student outcomes has not substantially increased. Recent publications have described the current state of PD in an attempt to focus attention on providing more effective opportunities for teacher learning (McConnell *et al.* 2012).

Most of these studies cite the PD programs how one-time, short-duration workshops and presentation mandated by school leaders for all teachers, which have been shown to be inadequate strategies for bringing about change in teacher practices (Campbell *et al.* 2015; Ekanayake and Wishart 2015; El-Hani and Greca 2012; McConnell *et al.* 2012). While many PD models exist, few provide sufficient support after the initial PD occurs (Smithenry *et al.* 2012). Lawless and Pellegrino (2007) present an overall schema that can be used retrospectively to classify the “type of PD”:

- Delivery mechanism: face to face, technology mediated, online
- Content of PD: skills, knowledge, pedagogy, design
- Duration: one shot, extended duration, follow-up.

Although the literature contains many examples of extensive PD programs, several models have been elaborated and tested (El-Hani and Greca 2012; McConnell *et al.* 2012; Saka, 2013; Smithenry *et al.* 2012). For example, an emerging model that meets the criteria for effective PD has teachers participating in Professional Learning Communities (PLC) where they themselves identify a common problem and determine the steps to address it (McConnell *et al.* 2012; Smithenry *et al.* 2012); and there are models that incorporate a socio-cultural perspective, where the training is based on the teacher’s own work, centred on students’ learning and adapted to the

teacher's PD stage (El-Hani and Greca 2012). The length and intensiveness of the PD programme also play an important role in changing teachers' attitudes towards the use of technology in teaching (Dori *et al.* 2002).

Many teachers require assistance in integrating digital technologies and they are willing to participate in in-service training sessions if appropriate time is allocated (Klieger *et al.* 2009). Training teachers in how to implement digital technologies is a process that requires differential training that takes into account the various fields into which the technology will be integrated (Klieger *et al.* 2009).

The work of Lawless and Pellegrino (2007) also highlighted a number of other issues related to the integration of digital technology into instruction that include the following: (1) focus of PD (technology grounded or content embedded), (2) delivery mechanism (face-to-face or online), (3) skill development or pedagogy enriching and (4) linkages to theories of how people learn and how to assess this learning. For Lawless and Pellegrino (2007), each of these constructs will likely impact how, when and how often technology is integrated in classroom practice, and they are specific indicators of technological PD versus more generic PD opportunities.

The literature contains many examples of extensive PD programmes and the use of digital technologies (Annetta *et al.* 2012; Athanassios 2010; Cavanaugh & Dawson 2010; Hsu 2010; Kim *et al.* 2012; So 2012; Webb 2005), but there is no unified view about how teachers' integration of ICT tools and digital resources should be measured (Hsu 2010). In this respect, the Technological Pedagogical and Content Knowledge (TPACK) model has been gaining credit among educational researchers (Annetta *et al.* 2012; Athanassios 2010). Athanassios (2010) established a series of TPACK-based workshop activities aimed at preparing upper-secondary physics teachers for the integration of microcomputer-based laboratories (MBL) in a student-centred teaching approach;

however, studies documenting university students' perceptions of their teachers' TPACK remain limited (Chang *et al.* 2014).

The study of Dori *et al.* (2002) adopted the CERA (collaborate-enact-reflect-adapt) model for PD programme. The literature on PD also includes support for the use of online communities for teacher learning (Cavanaugh & Dawson 2010; McConnell *et al.* 2012). For example, the online professional development (OPD) model by Cavanaugh and Dawson (2010) and design-based research principles guided the study of Annetta *et al.* (2012) to a PD project. Made possible by recent technological advances, video cases have emerged as an alternative, flexible form of PD where in-service teachers can repeatedly and vicariously view examples of reform teaching practices enacted within the context of the classroom (Smithenry *et al.* 2012).

Most teacher PD initiatives tend to focus on technological aspects (i.e. how to use various tools) while pedagogical and instructional issues (i.e. why and how to use those tools to enhance learning) are often taken for granted (Athanasios 2010; Hsu 2010; Lawless & Pellegrino 2007; McConnell *et al.* 2012). As a result, the application of ICT in school settings has been driven more by the accordance of technology rather than the demands of pedagogy and didactics of subject matter (Athanasios 2010).

Lawless and Pellegrino (2007) focused on what is known and unknown about PD to support the integration of technology into teaching and learning. To answer such questions, their review emphasise on three major challenges in the literature: (1) defining and evaluating what constitutes quality PD, irrespective of the specific PD topic; (2) that the integration of technology into teaching and learning is not a simple matter because there are many ways in which that integration can occur, some more productive and theoretically meaningful than others; (3) the fact that the recent

research literature on technology-related PD is extremely limited in scope and markedly weak regarding the inferences one can draw about what makes a difference.

Teachers' PD is a key factor in improving science education, but it shows limited impact when only a small number of teachers is reached, or when it focuses on only one aspect of teachers' development, such as learning science content, and is disconnected from teachers' practice (El-Hani and Greca 2012). The appearance of digital technologies in these courses to improve science education is commonly seen as possibility of an incorporation of innovation in training programmes and consequently in science teaching. In order to incorporate the innovations learnt in these courses, it is important to reformulate them because teachers often do not see clearly the benefits of these innovations for their PD programme (El-Hani & Greca 2012).

## **2.9 Preservice Teachers Awareness of Digital Platform for Professional Development**

The term awareness according to Saidu and Al Mamum (2022), can be interpreted differently, depending on the context of use. It may mean the teacher's knowledge about digital platform and the benefits it offers to professional development. They opined that teachers' level of awareness and skills affects their intention to adopt and use new technology. Similarly, Chigona and Dagodo (2011) observed that teachers who lack the ability and skills to use technology would likely resist its use.

Preservice teachers' knowledge about technology can be traced to their prior experiences using technology in and outside of school. Researchers investigate preservice teachers' technical knowledge in terms of their fluency using specific information and communications technologies (ICT) and where they learn to use their digital tools. For example, Lei (2009) suggests that

preservice teachers spend most of their time with digital devices on socially-based activities, such as viewing and sharing digital content like photographs (Kumar & Vigil, 2011).

A close examination of preservice teachers' technical knowledge not only serves teacher educators' interests but can also function as a valuable reflective practice for preservice teachers as they make sense of the connections between their prior and current practices (Burnett, 2009). Preservice teachers can increase both their awareness of the ecological nature of their digital lives (Ito *et al.*, 2013) and their understanding of the interrelationships between themselves, other stakeholders (e.g., colleagues and students), devices and digital practices (Matthew, Ritzhaupt & Cheng, 2020).

Teachers should be able to successfully integrate digital technology into their teaching processes while educating individuals of the digital world. In the digital age of teachers, individuals need to obtain awareness, self-confidence, knowledge, skills, competence, ethical frameworks for the functionality of education. They also need to integrate these skills to facilitate individuals' adaptation to the future by integrating them with their own learning teaching processes.

While dealing with the problems related to the digital adaptation of individuals to the digital age of the educational environments, the 'Coronavirus/Covid-19' pandemic, which emerged in 2019 and was effective all over the world in 2020, added new problems to individuals. It has brought comprehensive digital changes to all areas of our lives, education, in particular. Social distance and restrictive movement policies have significantly disrupted traditional education practices, and the digital education process has started quickly.

Across the world, student's skills with ICTs are seen as a critical part of 21st century capabilities, as they provide the opportunity for them to participate in and contribute to society as a citizen and

worker (ACARA, 2013; Department for Education 2013; US Department of Education, 2013). To achieve this end, and with the potential for educational advantage as another prime reason for their use in the classroom, governments and education departments have invested significantly in infrastructure and other initiatives. Despite this, and although there are pockets of desired levels of use of ICTs in schools for learning and teaching, it is not widespread, and it largely remains below expectation (Bate, Day & Macnish, 2013; Morris, 2010; Stobaugh & Tassell, 2011; Yeung, Tay, Hui, Lin, & Low, 2014).

Pre-service teachers, a group largely comprised of students that have grown up with ICTs all around them, and those who have received the most current preparation, are expected to be proficient in their use of ICTs for learning and teaching. However, Tondeur, Roblin, van Braak, Fisser and Voogt (2013) report that pre-service teachers often feel inadequately prepared to use ICTs for learning and teaching. This raises questions for teacher preparation programs, and highlights the need to better understand what influences preservice teacher attainment of knowledge and skill in the use of ICTs in the classroom.

## **2.10 Preservice teachers readiness of Digital Platform for Professional Development**

According to Al-Awidi and Aldhafeeri (2017), there are two main aspects of teacher readiness in the use of digital technology for learning, namely pedagogical readiness and technical readiness. Pedagogical readiness refers to the knowledge, skills, attitudes, and habits of teachers to integrate technology appropriately in learning. On the other hand, technical readiness relates to the knowledge and skills of teachers to carry out digital learning, the available of hardware and software for teachers and students, and the types of professional development programs established by schools and the Ministry of Education to prepare teachers to carry out digital learning.



As implementing learning, teachers must have readiness to use digital media. Readiness is the response patterns (follow-up) needed to start an activity in meeting needs and achieving goals. According to Slameto (2003), readiness is the willingness to respond or react. Willingness arises from a person and relates to maturity because maturity means readiness to carry out skills.

The rapid development of technology encourages teachers to make innovations related to the use of these technologies in learning, to meet the needs and do more interesting learning goals. Hoyles and Lagrange (2019) asserted that digital technology is the thing that most influences the education system in the world today. This is due to the effectiveness, efficiency and attractiveness aspects offered by digital technology-based learning. Therefore, the teacher shall be able to have readiness, both readiness of knowledge and skills.

Introducing technology in the classroom requires a paradigm shift in the learning process. Teachers are most affected by this change. Their readiness to meet new demands for implementing the curriculum will decide the success of this process. The responsibility of teachers in the process of technology integration in schools is very important, and every transition to the digital curriculum must consider the readiness of teachers to integrate technology. Teacher readiness is one of the main influencing factors that can influence the use of teacher technology and has a positive direct effect on technology integration in education (Inan & Lowther, 2009).

Each level of Hohlfeld *et al.* (2017) model is associated with factors that continually speak to preservice teachers' perceptions and their willingness to support a technological learning environment. When digital technology is perceived to empower preservice teachers, the teachers would be better able to utilize the functions available to achieve different classroom purposes fully. This, in turn, may improve the perceived usefulness of digital technology by Indigenous Amerindian preservice teachers. When preservice teachers encouraged their colleagues to use

digital technology and are willing to comply, they are likely to embrace it. Unfortunately, like the Professional Development Center, training institutes continued to battle the barriers to change the minds of potential adopters.

A study of students' readiness for internet-enabled learning in Obafemi Awolowo University, Ile-Ife, Nigeria by Jegede (2009) demonstrated that the skills that would ensure maximal benefits from internet-enabled learning environment were those not possessed by those students. Ezeahurukwe and Johnson (2011) posit that the training teachers received do not meet their needs for effective use of e-learning in their institutions. Similarly, Chukwu (2011) stated that enough attention is not being given to the use of electronic media in Nigeria teacher preparation programmes; and that, the programmes are still based predominantly on traditional practices. Study on pre-service teachers' preparedness or readiness for the use of web based e-learning found that the pre-service teachers are fairly well prepared of the e-learning skills (Enemali, Aliyu & Bulama, 2016)

### **2.11 Preservice Teachers Utilization of Digital Platform for Professional Development**

There is a growing body of research examining preservice teachers' general digital competencies. By focusing on more general digital practices that develop in and outside of school, researchers acknowledge the broader scope of digital practices that preservice teachers as well as inservice teachers cultivate before and during their careers (Starkey & Starkey, 2020).

Examples for preservice teachers' general digital competencies can include but are not limited to their use of presentation software, word processing programs, spreadsheets and databases, email, the Internet, and their overall technological awareness (Maderick *et al.* 2016). Notably, digital competencies are not constrained to specific skills with ICT; instead, Ferrari (2012) posits that it

includes the “knowledge, skills, attitudes (this includes abilities, strategies, values, and awareness)” for using digital tools and media to participate in today’s world.

Thus, preservice teachers’ digital competencies are multidimensional (Cantabrana *et al.*, 2019) and dynamic as the competencies grow to encompass preservice teachers’ technical knowledge and how they integrate it into their pedagogical approaches based on the unique social and cultural settings of their classrooms (Instefjord, 2016).

Preservice teachers’ perceptions of the value of digital tools impact their willingness and interest in using them during their TEPs. Preservice teachers with positive attitudes and confidence about using technology seem to more actively incorporate it into their teaching (Greene, 2011; Kent & Giles, 2017). However, preservice teachers’ beliefs about using technology may be more teacher-centered, such as presenting with PowerPoint (Donovan & Hansen, 2011), and this focus can inhibit them from taking a more preferred student-centered approach for using technology in ways that forefront student engagement (Funkhouser & Mouza, 2013). With that in mind, TEPs need to have a clear understanding of their preservice teachers’ dispositions and prior knowledge to support them in learning how to use technology in their classrooms (Donovan & Hansen, 2011). In doing so, teacher educators can also uncover internal and external hurdles that may impede their use of technology (Li *et al.*, 2016).

Tondur *et al.* (2012) propose a visualization model consisting of concentric circles to represent the external and internal influences on preservice teachers’ ability to teach with technology. Their two broadest circles depict the powerful role that institutions like universities play in shaping preservice teachers’ use of technology. While the role of institutions tends to be left out of the discussion (Pettersson, 2008), universities and schools can be enabling or constraining factors in terms of technology access (Mukama, 2010) and the level of training offered to staff and other

leaders (Tondeur *et al.*, 2019). These two settings are composed of influential people, variable access levels, and support for using technology in teaching and learning.

The perceptions of preservice teachers using digital technology would be free of effort when compared to the technology that demands more skills to integrate into the curriculum. Thus, the perceived ease of using digital technology may be affected by potential adopters' technological self-efficacy (Venkatesh & Davis, 2000). A quantitative study conducted by Varier *et al.* (2017) involved the analysis of a sample of 175 teachers and 293 students in southern Taiwan. 50% of the population originated from urban communities, and the other 50% from poor rural schools. 42.7% of the population was male, and 57.3% were female. Teachers' average teaching experience ranged from 1 year to 30 years. In terms of students, 38% were male, and 62% female. For grade distribution, 3.8% were third-grade students, 21.8% fourth, 38.6% fifth and 35.8% were sixth-grade students. The study discovered significant differences based on gender and geographical location of participants using technology. The teachers exhibit differences between attitudes and levels of experience of technology integration in rural and urban schools.

In terms of gender, male pre-service teachers were better at information and data literacy, digital content creation, safety, and problem-solving (Napal-Fraile *et al.*, 2018). Males were found to outperform females in identifying and accessing information, data and digital content related to information and data literacy. It was determined that male pre-service teachers received higher scores than female pre-service teachers in developing content in simple forms and making changes to ready-made content in the area of digital content creation. It is understood that male pre-service teachers are better at taking safety and privacy measures online to protect digital devices and content in the area of safety.

Sánchez-Prieto *et al.* (2019) discovered a gap between Indigenous Amerindian preservice teachers' perceptions about the adoption of digital technology and its use in classroom instruction. Indigenous Amerindian preservice teachers are considered as drivers of digital technology that would transform their communities globally. To attract Indigenous Amerindian preservice teachers to integrate digital technology, lecturers at the Professional Development Center should improve the content that fits the learners' needs. The study voiced the concern of the role that was rapidly converging global communication technologies would play in enriching Indigenous people's lives. They were hopeful that rural communities promote the importance of integrating digital technology into the classrooms.

Globally, rural and remote areas share common barriers of discrete and isolated populations with communication, transport, terrain, and climatic obstacles that make education delivery via technological applications challenging. The four most essential barriers recognized in the literature are lack of adequate training (Sánchez *et al.*, 2019), weak leadership (Ávila *et al.*, 2019) and professional development (Burden & Hopkins, 2017), and teacher attitudes towards technology use for preservice teachers (Gyamfi, 2017). Zayyad and Toycan (2018) stressed the impact of the barriers on teachers in training attitude and willingness toward the integration of classroom technology.

## **2.11 Summary**

The sections of the literature review included the conceptual framework, the theoretical framework, concept of preservice teachers, concept of digital platforms, concept of professional development of teachers, the development of the Nigerian education and teacher education system, digital platforms and pre-service teachers' professional development, preservice teachers awareness of digital platform for professional development, preservice teachers readiness of digital

platform for professional development and preservice teachers utilization of digital platform for professional development.

This study help filled the literature gap by providing valid and reliable findings on preservice teachers' awareness, readiness and utilization of digital platform for professional development.

This study involved exploring preservice teachers' perceptions and attitudes towards digital platforms that might assist with identifying significant barriers, vision, or motivational plans.

Researchers have examined the preservice teachers' awareness, readiness and utilization of digital platform for professional development in numerous ways but that of Nigeria universities remain unknown. Thus, the study intends to fill this research gap.

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Research Design

The design of the study was a descriptive design of the survey type. Descriptive survey research is a study designed to depict the participant in an accurate way. It encompasses any measurement procedure that involves asking questions from a respondent. It was designed to find out the pre-service teachers' awareness, readiness and utilization of digital platforms for professional development in a Nigerian University.

#### 3.2 Population, Sample and Sampling Techniques

The population of this study comprised of all pre-service teachers in Minna, Niger State, Nigeria. However, the target population of this study was pre-service teachers in faculty of Education, Federal University of Technology, Minna, Nigeria.

The sample size for the study was 178. To draw the desired sample, a multi-stage sampling procedure was employed for the study. Multi-stage sampling procedure involves more than two sampling procedures and for this study, the following procedures will be used:

**Stage I:** Stratified sampling was used to pre-service teachers in the department of Educational Technology, Faculty of Education, Federal University of Technology, Minna into the already existing five (5) levels, namely 100, 200, 300, 400 and 500 level.

**Stage II:** Purposive sampling technique was use to select 400 and 500 level pre-service teachers. The rational to choose 400 and 500 level pre-service teachers is that they have gone through series of educational training as they are nearing the point of graduation Educational technology.

**Stage III:** Proportionate sampling technique was used to select 90% of the pre-service teacher in 400 and 500 level.

**Table 3.1: Sample Selection Table**

S/N	Level	Population	Sample Selected
1	400 level	78	70
2	500 level	120	108
	<b>Total</b>	<b>198</b>	<b>178</b>

### **3.3 Research Instrument**

The instrument that was used for data collection of this study was a researcher's structured questionnaire named "Pre-service Teachers' Awareness, Readiness and Utilization of Digital Platforms for Professional Development in a Nigerian University" The questionnaire (which contains a sequence of questions designed for information needed from the respondents) was categorized into four sections A, B C and D. Section "A" will contain questions on the socio-demographic characteristics of the respondents and section 'B', 'C' and 'D' will contain questions on the pre-service teachers' awareness, readiness and utilization of digital platforms for professional development. The modified four-point Likert rating scale of Strongly Agree (SA) = 4 points, Agree (A) = 3 points, Disagree (D) = 2 points and Strongly Disagree (SD) = 1 point was used. The benchmark of 2.5 was used in making decisions. However, any mean score of 2.5 and above is acceptable or positive and any mean score that is below 2.5 will not be accepted or termed negative.

### **3.4 Validity of the Instrument**



To find out the validity of this instrument, copies of the questionnaire was given to three experts in the Department of Educational Technology, Faculty of Education, Federal University of Technology, Minna, Nigeria, to carry out both the face and content validity of the instrument. Comments and suggestions made by the experts was carefully studied and used to improve the quality of the instrument before the reliability of the instrument was carried out and this was used for final administration to the respondents.

### **3.5 Procedure of Data Collection**

Data collection is defined as a systematic process of gathering information relevant to the study to answer the researcher's questions. A letter of introduction was obtained by the researcher from the Department, signed by the Head of Department, Educational Technology, Faculty of Education, Federal University of Technology, Minna, Nigeria. This would enable the researcher to gain access to the respondents for instrument administration and data collection. The researcher answer any question that was not clear to the respondents. The questionnaire was administered to each respondent in their respective classes. The researcher made sure that the questionnaires were collected immediately to avoid loss of the instrument.

### **3.6 Method of Data Analysis**

The completed copies of the questionnaire for this study was collected, sorted, coded and subjected to appropriate statistical analysis. Section A which contains the demographic data of the respondents was analyzed using descriptive statistics of frequency counts and percentages. The mean ranking order was used to answer the research questions, while the null hypotheses was analyzed using inferential statistics of independent sample t-test at 0.05 level of significance using the Statistical Package for Social Sciences (SPSS) version 24.0.

## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.1 Introduction

This chapter presents and analyzed the data collected from the collected data from the field. The chapter covers the results and discussions based on the samples used in the study. 178 copies of the questionnaire were distributed and retrieved from the respondents which were correctly filled and returned. Data analysis was based on the questionnaire received from respondents. The data collected were analyzed using both descriptive and inferential statistics. Frequency counts and percentages were employed, to answer the research questions were answered using mean ranking order while a t-test statistical tool was employed to analyze the hypotheses at 0.05 level of significance.

#### 4.2 Presentation of Results

All data collected in this section were tabulated using frequencies and percentages as indicated in the following table:

**Table 4.1: Demographic Characteristics of the Respondents (n=178)**

<b>VARIABLES</b>	<b>FREQUENCY</b>	<b>PERCENTAGE (%)</b>
<b>Age</b>		
Below 20	14	7.9
20 – 25	116	65.2
26 – 30	43	24.2
Above 30	5	2.8
<b>Gender</b>		
Male	107	60.1

Female	71	39.9
<b>Level</b>		
400	70	39.3
500	108	60.7

Table 4.1 showed the demographic characteristics of the respondents. The analysis revealed that 14 (7.9%) out of 178 respondents were below 20 years old, 116 (65.2%) were between 20 – 25 years old, 43 (24.2%) were between 26 – 30 years old, and the remaining 5 (2.8%) were above 30 years old. This implies that, the majority of the respondents. The analysis of respondents, based on gender shows that 107 (60.1%) out of total respondents were male while 71 (39.9%) were female. The table further revealed that 70 (39.3%) of the respondents were 400 level while 108 (60.7%) are in 500 level.

### 4.3 Research Questions

**Research Question 1:** What is the level of preservice teachers' awareness of digital platforms for professional development in a Nigerian University?

**Table 4.2: Mean Ranking Order on the Preservice Teachers' Awareness of Digital Platforms for Professional Development in a Nigerian University**

S/N	Item	Mean	Rank
1.	Easyclass allows educators to create online classes course materials; manage assignments, quizzes, and exams; monitor due dates; grade results and provide students with feedback all in one place	2.88	6 <sup>th</sup>
2.	Zoom Classroom is used for video conferencing, collaborations, virtual classrooms which aid professional development	3.34	2 <sup>nd</sup>
3.	Microsoft Teams is a hub for teamwork in Office 365 that keep team's chats, meetings, files, and apps together in one place	2.85	8 <sup>th</sup>
4.	Hypersay is a platform for live interactive presentations	2.89	5 <sup>th</sup>
5.	Google Form can be used for assessment purposes and take online quizzes	3.29	4 <sup>th</sup>
6	Google Classroom allows teacher to make online classrooms, upload teaching material and conduct online quizzes	3.30	3 <sup>rd</sup>

7	With Edmodo, teacher can share class announcements, learning materials, and make learning accessible anywhere	2.87	7 <sup>th</sup>
8	Google Hangouts Meet connected teachers and students for teaching and learning	2.83	9 <sup>th</sup>
9	With Youtube Videos, teachers can make classroom channel and upload lecture videos	3.40	1 <sup>st</sup>
10	Using Screen Recorders, the teacher can make tutorial videos	2.82	10 <sup>th</sup>
<b>Aggregate Mean</b>		<b>3.05</b>	

(Decision Mean – 2.5)

Table 4.2 showed the level of preservice teachers' awareness of digital platforms for professional development in a Nigerian University. The Table shows that Items 9, 2 and 6 which states that “with Youtube Videos, teachers can make classroom channel and upload lecture videos; Zoom Classroom is used for video conferencing, collaborations, virtual classrooms which aid professional development; and Google Classroom allows teacher to make online classrooms, upload teaching material and conduct online quizzes” have mean scores of 3.40, 3.34 and 3.30 ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> respectively. While Items 10 which states that “Using Screen Recorders, the teacher can make tutorial videos” with a mean score of 2.82 rank 10<sup>th</sup>. All the ten (10) items have mean score that are above the mid-mean score of 2.50, then it can be said that majority of the respondents are aware of the digital platforms for professional development. The result also shows that the level of preservice teachers' awareness of digital platforms for professional development in FUT Minna is high.

**Research Question 2:** What is the level of preservice teachers' readiness of digital platforms for professional development in a Nigerian University?

**Table 4.3: Mean Ranking Order on the Preservice Teachers' Readiness of Digital Platforms for Professional Development in a Nigerian University**

S/N	Item	Mean	Rank
	I'm competent in using:		

1	Easyclass as digital platform for professional development	2.85	6 <sup>th</sup>
2	Zoom Classroom as digital platform for professional development	2.90	4 <sup>th</sup>
3	Microsoft Teams as digital platform for professional development	2.82	8 <sup>th</sup>
4	Hypersay as digital platform for professional development	2.80	9 <sup>th</sup>
5	Google Form as digital platform for professional development	2.91	3 <sup>rd</sup>
6	Google Classroom as digital platform for professional development	2.95	2 <sup>nd</sup>
7	Edmodo as digital platform for professional development	2.87	5 <sup>th</sup>
8	Google Hangouts Meet as digital platform for professional development	2.83	7 <sup>th</sup>
9	Youtube Videos as digital platform for professional development	3.11	1 <sup>st</sup>
10	Screen Recorders as digital platform for professional development	2.74	10 <sup>th</sup>
	<b>Aggregate Mean</b>	<b>2.60</b>	

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(Decision Mean – 2.5)

Table 4.3 showed the level of preservice teachers' readiness of digital platforms for professional development in a Nigerian University. Table 4.3 shows that Items 9, 6 and 5 which states that “I am competent in using Youtube Videos as digital platform for professional development; Google Classroom as digital platform for professional development; Google Form as digital platform for professional development” have mean scores of 3.11, 2.95 and 2.91 ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> respectively. While Items 10 which states that “Using Screen Recorders, the teacher can make tutorial videos” with a mean score of 2.74 rank 10<sup>th</sup>. All the ten (10) items have mean score that are above the mid-mean score of 2.50, then it can be said that majority of the respondents are ready to use digital platforms for professional development. The result also shows that the level of preservice teachers' readiness of digital platforms for professional development in FUT Minna is high.



**Research Question 3:** What is the level of preservice teachers' utilization of digital platforms for professional development in a Nigerian University?

**Table 4.4: Mean Ranking Order on the Preservice Teachers' Utilization of Digital Platforms for Professional Development in a Nigerian University**

S/N	Item	Mean	Rank
	I utilize:		
1	Easyclass to create online classes course materials; manage assignments, quizzes, and exams; monitor due dates; grade results and provide students with feedback	2.12	5 <sup>th</sup>
2	Zoom Classroom for video conferencing, collaborations, virtual classrooms	1.97	8 <sup>th</sup>
3	Microsoft Teams to keep team's chats, meetings, files, and apps together in one place	2.15	3 <sup>rd</sup>
4	Hypersay for live interactive presentations	2.11	6 <sup>th</sup>
5	Google Form for assessment purposes and take online quizzes	2.07	7 <sup>th</sup>
6	Google Classroom to make online classrooms, upload teaching material and conduct online quizzes	1.83	10 <sup>th</sup>
7	Edmodo to share class announcements, learning materials, and make learning accessible anywhere	2.13	4 <sup>th</sup>
8	Google Hangouts Meet to connect to my students for teaching and learning	2.17	2 <sup>nd</sup>
9	Youtube Videos to make classroom channel and upload lecture videos	1.96	9 <sup>th</sup>
10	Screen Recorders to make tutorial videos	2.18	1 <sup>st</sup>
<b>Aggregate Mean</b>		<b>2.07</b>	

(Decision Mean – 2.5)

Table 4.4 showed the level of preservice teachers' utilization of digital platforms for professional development in a Nigerian University. Table 4.4 shows that Items 10, 8 and 3 which states that “I utilize screen Recorders to make tutorial videos; Google Hangouts Meet to connect to my students for teaching and learning; Microsoft Teams to keep team's chats, meetings, files, and apps together

in one place” have mean scores of 2.18, 2.17 and 2.15 ranked 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> respectively. While Items 6 which states that “Google Classroom to make online classrooms, upload teaching material and conduct online quizzes” with a mean score of 1.83 rank 10<sup>th</sup>. All the ten (10) items have mean score that are below the mid-mean score of 2.50, then it can be said that majority of the respondents do not utilize digital platforms for professional development. The result also shows that the level of preservice teachers' utilization of digital platforms for professional development in FUT Minna is low.

#### 4.4 Hypotheses Testing

Three null hypotheses were generated and as well tested for this study. The hypotheses were tested using the independent sample t-test statistical method at 0.05 level of significance.

##### 4.4.1 Hypothesis One

There is no significant difference in preservice teachers' awareness of digital platforms for professional development based on gender.

**Table 4.5: T-Test Showing the Difference in Preservice Teachers' Awareness of Digital Platforms for Professional Development based on Gender**

Gender	N	Mean	SD	df	Cal. t-value	Crit. t-value	p-value
Male	107	3.08	0.67	176	0.68	1.65	0.50
Female	71	3.01	0.65				

Table 4.5 shows a calculated t-value of 0.68, a critical t-value of 1.65 and a p-value of 0.50. The p-value calculated is higher than the alpha level at 0.05 then the hypothesis is accepted. Hence, there is no significant difference in preservice teachers' awareness of digital platforms for professional development based on gender.



#### 4.4.2 Hypothesis Two

There is no significant difference in preservice teachers' readiness for digital platforms for professional development based on gender.

**Table 4.6: T-Test Showing the Difference in Preservice Teachers' Readiness for Digital Platforms for Professional Development based on Gender**

Gender	N	Mean	SD	df	Cal. t-value	Crit. t-value	p-value
Male	107	2.90	0.63	176	0.74	1.65	0.46
Female	71	2.83	0.63				

Table 4.6 shows a calculated t-value of 0.74, a critical t-value of 1.65 and a p-value of 0.46. The p-value calculated is higher than the alpha level at 0.05 then the hypothesis is accepted. Hence, there is no significant difference in preservice teachers' readiness for digital platforms for professional development based on gender.

#### 4.4.3 Hypothesis Three

There is no significant difference in preservice teachers' utilization of digital platforms for professional development based on gender.

**Table 4.7: T-Test Showing the Difference in Preservice Teachers' Utilization of Digital Platforms for Professional Development based on Gender**

Gender	N	Mean	SD	df	Cal. t-value	Crit. t-value	p-value
Male	107	2.06	0.69	176	0.19	1.65	0.85
Female	71	2.08	0.66				

Table 4.7 shows a calculated t-value of 0.19, a critical t-value of 1.65 and a p-value of 0.85. The p-value calculated is higher than the alpha level at 0.05 then the hypothesis is accepted. Hence, there is no significant difference in preservice teachers' utilization of digital platforms for professional development based on gender.

#### **4.5 Discussion of Findings**

Hypothesis one stated that there was no significant difference in preservice teachers' awareness of digital platforms for professional development based on gender. Chigona and Chigona (2016) observed that teachers who lack the ability and skills to use technology would likely resist its use. Also, Lei (2019) suggests that preservice teachers spend most of their time with digital devices on socially-based activities, such as viewing and sharing digital content like photographs. Preservice teachers can increase both their awareness of digital platform and their understanding of the interrelationships between themselves, other stakeholders (colleagues and students), devices and digital practices (Matthew, 2020).

Hypothesis two stated that there was no significant difference in preservice teachers' readiness for digital platforms for professional development based on gender. The finding sync with Hohlfeld *et al.* (2017) who asserted that when digital technology is perceived to empower preservice teachers, the teachers would be better able to utilize the functions available to achieve different classroom purposes fully. Jegede (2019) demonstrated that the skills that would ensure maximal benefits from internet- enabled learning environment were those not possessed by preservice teachers. Chukwu (2018) stated that enough attention is not being given to the use of electronic media in Nigeria teacher preparation programmes; and that, the programmes are still based

predominantly on traditional practices. Enemali, Aliyu and Bulama, (2016) found that the pre-service teachers are fairly well prepared of the e-learning skills. Teacher readiness is one of the main influencing factors that can influence the use teacher technology and has a positive direct effect on technology integration in education (Inan & Lowther, 2019). Several studies have found that pre-service teachers are eager to use digital platforms (Tam & Lim, 2013; Cigdem & Yildirim, 2014). Fisser and Voogt (2013) report that pre-service teachers often feel inadequately prepared to use ICTs for learning and teaching.

Hypothesis three stated that there was no significant difference in preservice teachers' utilization of digital platforms for professional development based on gender. Preservice teachers' digital utilization are multidimensional and dynamic as the competencies grow to encompass preservice teachers' technical knowledge and how they integrate it into their pedagogical approaches based on the unique social and cultural settings of their classrooms (Instefjord, 2016). Preservice teachers' perceptions of the value of digital tools impact their willingness and interest in using them. Preservice teachers with positive attitudes and confidence about using technology seem to more actively incorporate it into their teaching (Kent & Giles, 2017). However, the findings contradict that of Varier *et al.* (2017) who discovered significant differences based on gender and geographical location of participants using technology. Male pre-service teachers were better at information and data literacy, digital content creation, safety, and problem-solving (Napal-Fraile *et al.*, 2018). Males were found to outperform females in identifying and accessing information, data and digital content related to information and data literacy. It was determined that male pre-service teachers received higher scores than female pre-service teachers in developing content in simple forms and making changes to ready-made content in the area of digital content creation. It

is understood that male pre-service teachers are better at taking safety and privacy measures online to protect digital devices and content in the area of safety.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of the entire study carried out by the researcher, drew conclusion as well as recommendations on the preservice teachers' awareness, readiness and utilization of digital platforms for professional development in a Nigerian University.

#### **5.2 Summary**

The study examined the preservice teachers' awareness, readiness and utilization of digital platforms for professional development in a Nigerian University. Relevant literatures were reviewed. The concept of preservice teachers, concept of digital platforms, concept of professional development of teachers, the development of the Nigerian education and teacher education system, digital platforms and pre-service teachers' professional development, preservice teachers awareness of digital platform for professional development, preservice teachers readiness of digital

platform for professional development as well as preservice teachers utilization of digital platform for professional development were reviewed.

The descriptive research of survey type was adopted. The populations for the study were all preservice teachers in Minna, Niger State, Nigeria. One hundred and seventy-eight respondents were sampled for the study. A researcher-structured questionnaire was adopted for the study. The instrument was administered by the researcher and research assistants. The data collected in the study were analyzed using the descriptive statistics of both frequency count and percentage. Inferential statistics of independent sample t-test was used to analyse the hypotheses postulated for this study at 0.05 alpha level of significance.

### **5.3 Conclusions**

Based on the findings of the study, the following conclusions were drawn:

1. The level of preservice teachers' awareness of digital platforms for professional development in FUT Minna is high.
2. The level of preservice teachers' readiness of digital platforms for professional development in FUT Minna is high.
3. The level of preservice teachers' utilization of digital platforms for professional development in FUT Minna is low.
4. There is no significant difference in preservice teachers' awareness of digital platforms for professional development based on gender.
5. There is no significant difference in preservice teachers' readiness for digital platforms for professional development based on gender.

6. There was no significant difference in preservice teachers' utilization of digital platforms for professional development based on gender.

#### **5.4 Recommendations**

Based on the conclusions drawn from this study, the following recommendations were made;

1. There is a need to intensify the awareness on digital platform for professional development among preservice teachers.
2. Effort should be made by preservice teachers to sustain the already established preparedness for digital platform in professional development.
3. Preservice teachers should be encouraged to utilize digital platform for professional development.

#### **REFERENCES**

- Akingbe, M. A. A. (2014). Effective digital tools for education transformation in Nigeria: Challenges and prospects. *Journal of Educational Media and Technology (JEMT)*, 18(1), 61-67.
- Al-Awidi, H., & Aldhafeeri, F. (2017). Teachers' readiness to implement digital curriculum in Kuwaiti schools. *Journal of Information Technology Education Research*, 16, 105-126.
- Amutha, S., & Kennedy, S. J. (2015). Awareness of technology-based education by the student teachers. *International Journal of Scientific and Research Publications*, 5(9), 1-4.
- Annetta, L. A., Frazier, W. M., Folta, E., Holmes, S., Lamb, R., & Cheng, M. T. (2012). Science teacher efficacy and extrinsic factors toward professional development using video games in a design-based research model: the next generation of STEM learning. *Journal of Science Education and Technology*, 22(1), 47-61.
- Athanassios, J. (2010). Designing and implementing an integrated technological pedagogical science knowledge framework for science teachers professional development. *Computers & Education*, 55(3), 1259-1269.

- Australian Curriculum, Assessment and Reporting Authority. (2013). *General capabilities in the Australian curriculum*. Author. Retrieved from <http://www.australiancurriculum.edu.au/GeneralCapabilities/Pdf/Overview>
- Ávila, L. V., Beuron, T. A., Brandli, L. L., Damke, L. I., Pereira, R. S., & Klein, L. L. (2019). Barriers to innovation and sustainability in universities: an international comparison. *International Journal of Sustainability in Higher Education*, 20(5), 805-821.
- Azimi, H. M. (2013). Readiness for implementation of e-learning in colleges of education. *Journal of Novel Applied Sciences*, 2(12), 769-775.
- Barnett, J., McPherson, V., & Sandieson, R. M. (2013). Connected teaching and learning: The uses and implications of connectivism in an online class. *Australasian Journal of Educational Technology*, 29(5), 685-698.
- Bate, F. G., Day, L., & Macnish, J. (2013). Conceptualising changes to pre-service teachers' knowledge of how to best facilitate learning in mathematics: A TPACK inspired initiative. *Australian Journal of Teacher Education*, 38(5).
- Bell, F. (2009). *Connectivism: A network theory for teaching and learning in a connected world*. University of Salford, Manchester, United Kingdom.
- Burden, K., & Hopkins, P. (2017). Barriers and challenges facing pre-service teachers use of mobile technologies for teaching and learning. In blended learning: concepts, methodologies, tools, and applications. *International Journal of Mobile and Blended Learning*, 8(2)1665-1686
- Burnett, C. (2009). That's more like how they know me as a person: One primary pre-service teacher's stories of her personal and "professional" digital practices. *Literacy*, 43(2), 75-82.
- Cagiltay, N. E., Yildirim, S., & Aksu, M. (2016). Students' preferences on web-based instruction: linear or non-linear. *Journal of Educational Technology & Society*, 9(3), 105-112.
- Campbell, T., Longhurst, M. L., Wang, S. K., Hsu, H. Y., & Coster, D. C. (2015). Technologies and reformedbased science instruction: the examination of a professional development model focused on supporting science teaching and learning with technologies. *Journal of Science Education and Technology*, 24(5), 562– 579.
- Cantabrana, L., Rodriguez, M. & Cervera, M. (2019). Assessing Teacher Digital Competence: the Construction of an Instrument for Measuring the Knowledge of Pre-Service Teachers, 8(1), 73–78.
- Cassar, C. (2014). Beyond digital technology: Challenges for teachers and teacher trainers. *Andragoski Glasnik*, 18(1), 39-46.
- Cavanaugh, C., & Dawson, K. (2010). Design of online professional development in science content and pedagogy: a pilot study in Florida. *Journal of Science Education and Technology*, 19, 438–446.
- Chang, Y., Jang, S.-J., & Chen, Y. H. (2014). Assessing university students' perceptions of their physics instructors' TPACK development in two contexts. *British Journal of Educational Technology*. <https://doi.org/10.1111/bjet.12192>.

- Chigona, D. & Dagado, R. (2016). Adoption and use of e-learning at tertiary level in South Africa: A qualitative analysis. *Global Learn Conference*, 28 March–1 April, Melbourne.
- Cigdem, H., & Yildirim, O. G. (2014) Effects of students' characteristics on online learning readiness: A Vocational College example. *Turkish Online Journal of Distance Education-TOJDE*, 15(3), 80-92.
- Cormier, D. (2008). Rhizomatic education: Community as curriculum. *Innovate*, 4(5). Retrieved from <http://davecormier.com/edblog/2008/06/03/rhizomatic-educationcommunity-as-curriculum/>
- Department for Education. (2013). *Digital technology in schools*. Retrieved from <http://www.education.gov.uk/a00201823/digital-technology-in-schools>
- Desjardin, F. J., Davidson, A., Bayone, T. J., Van-Voosteren, R., & Child, E. (2017). General technology competence and use framework. Retrieved from <http://en/abca/generaltechnologycompetency.us/>.
- Donovan, L., & Hansen, L. E. (2011). One-to-One Laptop Teacher Education: Does Involvement Affect Candidate Technology Skills and Dispositions?, 44(2), 121–139.
- Dori, Y. J., Tal, R. T., & Peled, Y. (2002). Characteristics of science teachers who incorporate web-based teaching. *Research in Science Education*, 32(4), 511–547.
- Downes, S. (2012). *Connectivism and connective knowledge: Essays on meaning and learning networks*. National Research Council (Canada).
- Ekanayake, S. Y., & Wishart, J. (2015). Integrating mobile phones into teaching and learning: a case study of teacher training through professional development workshops. *British Journal of Educational Technology*, 46(1), 173–189.
- El-Hani, C. N., & Greca, I. M. (2012). ComPratica: a virtual community of practice for promoting biology teachers' professional development in Brazil. *Research in Science Education*, 43(4), 1327–1359.
- Federal Republic of Nigeria (FRN) (2012). *Nigerian Certificate in Education minimum standards for general education*. Abuja: National Commission for Colleges of Education (NCCE)
- Ferrari, A. (2012). *Digital competence in practice: An analysis of frameworks*. Sevilla: JRC IPTS.
- Francis, A., Philip, O., & Francis, K. S. (2017). Perception of pre-service teachers' towards the teaching practice programme in college of technology education. University of Education, Winneba. *Journal of Education and Practice*, 8(4), 156-163.
- Funkhouser, B. J., & Mouza, C. (2013). Computers & Education Drawing on technology : An investigation of preservice teacher beliefs in the context of an introductory educational technology course. *Computers & Education*, 62, 271–285.
- Greene, B. A. (2011). Preservice teachers' beliefs, attitudes, and motivation about technology integration, 45(1), 29–47



- Gyamfi, S. A. (2017). Preservice teachers' attitude towards information and communication technology usage: *International Journal of Education and Development using Information and Communication Technology*, 13(1), 52-69.
- Hammond, M. (2013). Researching Teacher Take-Up of ICT: Past Perspectives and Present-Day Challenges, in *World Conference on Computers in Education*, July 2-5, 2013, Torun, Poland.
- Hernández, R. (2017). Impact of ICT on Education: Challenges and Perspectives. *Journal of Educational Psychology - Propósitos y Representaciones*, 5(1), 337-347.
- Hohlfeld, T. N., Ritzhaupt, A. D., Dawson, M. K., & Wilson, L. (2017). An examination of seven years of technology integration in Florida schools: Through the lens of the levels of digital divide in schools. *Computers & Education*, 1(13), 135-161.
- Hoyles, C., & Lagrange, J. B. (2019). *Mathematics Education and Technology—Rethinking the Terrain*. Springer: New York
- Hsu, S. (2010). Developing a scale for teacher integration of information and communication technology in grades 1–9. *Journal of Computer Assisted Learning*, 26(3), 175–189.
- Inan, F., & Lowther, D. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development*, 58(2), 137-154.
- Instefjord, E. (2016). Appropriation of digital competence in teacher education. *Nordic Journal of Digital Literacy*, 155-171.
- Ismail, S. A. A. (2011). Student teachers' microteaching experiences in pre-service English teacher education program. *Journal of Language Teaching and Research*, 2, 1043-1051.
- Ito, M., Gutierrez, K., Livingstone, S., Penuel, B., Rhodes, J., Salor, K., ... Watkins, S. C. (2013). *Connected Learning and Agenda for Research and Design*. Irvine, CA: Digital Media and Learning Research Hub
- Kent, A. M., & Giles, R. M. (2017). Preservice Teachers' Technology Self-Efficacy. *SRATE Journal*, 26(1), 9–20.
- Kim, H., Miller, H., Herbert, B., Pedersen, S., & Loving, C. (2012). Using a wiki in a scientist-teacher professional learning community: impact on teacher perception changes. *Journal of Science Education and Technology*, 21(4), 440–452.
- Klieger, A., Ben-Hur, Y., & Bar-Yossef, N. (2009). Integrating laptop computers into classroom: attitudes, needs, and professional development of science teachers—a case study. *Journal of Science Education and Technology*, 19, 187–198.
- Kumar, S., & Vigil, K. (2011). The Net Generation as Preservice Teachers: Transferring Familiarity with New Technologies to Educational Environments, 27(4).
- Lawless, K. A., & Pellegrino, J.W. (2007). Professional development in integrating technology into teaching and learning: knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, 77(4), 575–614.
- Leah, A. (2018). 7 reasons why digital technology literacy is important for teachers. Retrieved from <https://trossieronline.usc.edu/blogs/teacher-digitalliteracy/>.

- Lei, J. (2019). Digital Natives as Preservice Teachers: What Technology Preparation Is Needed? *25*(3), 87–98.
- Li, K., Li, Y., & Franklin, T. (2016). *Preservice Teachers' Intention to Adopt Technology in Their Future Classrooms*. <https://doi.org/10.1177/0735633116641694>
- Maderick, J. A., Zhang, S., Hartley, K., & Marchand, G. (2016). Preservice Teachers and Self-Assessing Digital Competence. Retrieved from <https://doi.org/10.1177/0735633115620432>
- Matthew, W, M. L., Ritzhaupt, A. D., & Cheng, L. (2020). Computers & Education The impact of teacher education courses for technology integration on pre-service teacher knowledge : A meta-analysis study. *Computers & Education*, *156*(June), 103941.
- McConnell, T. J., Parker, J. M., Eberhardt, J., Koehler, M. J., & Lundeberg, M. A. (2012). Virtual professional learning communities: teachers' perceptions of virtual versus face-to-face professional development. *Journal of Science Education and Technology*, *22*(3), 267–277.
- Morris, D. (2010). E-confidence or incompetence: Are teachers ready to teach in the 21<sup>st</sup> century? *World Journal on Educational Technology*, *2*(2), 141-154.
- Mukama, E. (2010). The interplay between learning and the use of ICT in Rwandan student teachers' everyday practice, 539–548.
- Muralidharan, K., Singh, A., & Ganimian, A. J. (2017). Disrupting education? Experimental evidence on technology-aided instruction in India. NBER Working Paper No: 22923. Retrieved from <https://www.nber.org/papers/w22923.pdf>
- Napal-Fraile, M., Peñalva-Vélez, A., & Mendióroz-Lacambra, A. (2018). Development of Digital Competence in Secondary Education Teachers' Training. *Education Sciences*, *8*(3), 104–104.
- Owolabi, B. O., & Owolabi, B. G. (2015). Electronic learning (e-learning) as a catalyst for effective instructional delivery in Nigerian tertiary institutions. *International Journal of Scientific and Engineering Research*, *6*(11), 964970.
- Pettersson, F. (2018). *On the issues of digital competence in educational contexts – a review of literature*, 1005–1021
- Putri, D. M., Ferlya, E., & Yusnila, Y. (2018). Pre-service teachers' performance post microteaching class in field experience program. *Englisia Journal*, *5*(2), 102-110.
- Reiner, M. (2017). *Digital awareness among today's graduates*. Retrieved from <http://www.ia.valley.edu/2017/04125/digital-awareness-among-today'sgraduates>.
- Saidu, M.K. & Al Mamun (2022). Exploring the factors affecting behavioural intention to use google classroom: University teachers' perspectives in Bangladesh and Nigeria. *Tech Trends* (2022).
- Saka, Y. (2013). Who are the science teachers that seek professional development in research experience for teachers (RET's)? Implications for teacher professional development. *Journal of Science Education and Technology*, *22*(6), 934–951.

- Sánchez-Prieto, J. C., Hernández-García, Á., García-Peñalvo, F. J., Chaparro-Peláez, J., & Olmos-Migueláñez, S. (2019). Break the walls! Second-Order barriers and the acceptance of mLearning by first-year preservice teachers. *Computers in Human Behavior*, *95*, 158-167
- Saubari, N., & Baharuddin, M. F. (2016). Digital literacy awareness among students. *Research HUB*, *1*(1), 57-63.
- Shafqat, A., & Muhammad I. K. (2015). Assessment of teaching practice: Perceptions of students' performance in mathematics. *International Journal of Developing Studies*, *1*(1), 60-68.
- Siemens, G. (2004). *Connectivism: A learning theory for the digital age*. Retrieved from <http://www.elearnspace.org/Articles/connectivism.htm>
- Sinha, E. & Bagarukayo, K. (2019). Online Education in Emerging Knowledge Economies: Exploring factors of motivation, de-motivation and potential facilitators; and studying the effects of demographic variables. *International Journal of Education and Development using Information and Communication Technology*, *15*(2), 5-30.
- Skeels, M. M., & Grudin, J. (2016). When social networks cross boundaries: a case study of workplace use of facebook and linkedin. In *Proceedings of the ACM 2009 international conference on supporting group work* (95-104). ACM.
- Slameto. (2003). *Belajar dan Faktor yang Mempengaruhinya*. Jakarta: PT. Rineka Cipta.
- Smithenry, D. W., Prouty, J., & Capobianco, B. M. (2012). Collaboratively exploring the use of a video casebased book as a professional development tool. *Journal of Science Education and Technology*, *22*(5), 735– 750.
- So, W. W. M. (2012). Creating a framework of a resource-based e-learning environment for science learning in primary classrooms. *Technology, Pedagogy and Education*, *21*(3), 317–335.
- Starkey, L., & Starkey, L. (2020). A review of research exploring teacher preparation for the digital age digital age. *Cambridge Journal of Education*, *50*(1), 37–56.
- Stobaugh, R., & Tassell, J. (2011). Analyzing the degree of technology use occurring in preservice teacher education. *Educational Assessment, Evaluation & Accountability*, *23*(2), 143-157.
- Tang, S. F., & Lim, C. L. (2013). Undergraduate Students' Readiness In E-Learning: A Study at the Business School in a Malaysian Private University. *International Journal of Management & Information Technology*, *4*(2), 198-204
- Thakur, N. (2014). A study on awareness of trainee teachers in relation to ICT, *IOSR. Journal of Research and Methods in Education*, *4*(1), 6-10.
- Tondeur, J., Roblin, N. P., van Braak, J., Fisser, P., & Voogt, J. (2013). Technological pedagogical content knowledge in teacher education: in search of a new curriculum. *Educational Studies*, *39*(2), 239-243.
- Tondeur, J., Van Braak, J., Sang, G., Voogt, J., Fisser, P., & Ottenbreit-Leftwich, A. (2012). Preparing pre-service teachers to integrate technology in education: A synthesis of qualitative evidence. *Computers and Education*, *59*(1), 134–144.

- UNESCO (2021). *Pre-service teacher training*. Retrieved from <http://uis.unesco.org/glossary-term>.
- US Department of Education. (2013). *Recognizing educational success, professional excellence and collaborative teaching*. Retrieved from <http://www2.ed.gov/documents/respect/blueprint-for-respect.pdf>
- Varier, D., Dumke, E. K., Abrams, L. M., Conklin, S. B., Barnes, J. S., & Hoover, N. R. (2017). Potential of one-to-one technologies in the classroom: teachers and students weigh in. *Educational technology research and development*, 65(4), 967-992.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46, 186–204.
- Webb, M. E. (2005). Affordances of ICT in science learning: implications for an integrated pedagogy. *International Journal of Science Education*, 27(6), 705–735.
- Yeung, A. S., Tay, E., Hui, C., Lin, J. H., & Low, E. (2014). Pre-service Teachers' Motivation in Using Digital Technology. *Australian Journal of Teacher Education*, 39(3).
- Yilmaz, R. M. (2016). Educational magic toys developed with augmented reality technology for early childhood education. *Computers in Human Behavior*, 54, 240-248.
- Zayyad, M. A., & Toycan, M. (2018). Factors affecting sustainable adoption of e-health technology in developing countries: an exploratory survey of Nigerian hospitals from the perspective of healthcare professionals. *Peer Journal*, 6: e4436.

## APPENDIX I

### QUESTIONNAIRE

Department of Educational  
Technology,  
Faculty of Education,  
Federal University of Technology,  
Minna-Nigeria.

Dear Respondents,

The researcher is a student of the above department, who is currently conducting a research on Preservice Teachers' Awareness, Readiness and Utilization of Digital Platforms for Professional Development in a Nigerian University in partial fulfilment of the requirements for the award of B.Tech Degree in Educational Technology. Kindly respond to the options objectively as your confidentiality is highly secured. All the information obtained from you will be used for the purpose of this study.

Thank you.

Yours Faithfully,

Awwal Muhammad

### **Section A: Demographic Characteristics of the Respondents**

Instruction: Please tick [] as applicable to you

1. Age: (a) below 20 (  ) (b) 20 – 25 (  ) (c) 26 – 30 (  ) (d) Above 30 (  )
2. Gender: (a) Male (  ) (b) Female (  )
3. Level: (a) 400 (  ) (b) 500 (  )

#### **Hint:**

- |   |                   |   |    |
|---|-------------------|---|----|
| 1 | Strongly Disagree | = | SD |
| 2 | Disagree          | = | D  |
| 3 | Agree             | = | A  |
| 4 | Strongly Agree    | = | SA |

**Section B: Pre-service Teachers' Awareness of Digital Platforms for Professional Development**

S/N	Awareness	SD	D	A	SA
	I am aware that:				
1.	Easyclass allows educators to create online classes course materials; manage assignments, quizzes, and exams; monitor due dates; grade results and provide students with feedback all in one place.				
2	Zoom Classroom is used for video conferencing, collaborations, virtual classrooms which aid professional development				
3	Microsoft Teams is a hub for teamwork in Office 365 that keep team's chats, meetings, files, and apps together in one place.				
4	Hypersay is a platform for live interactive presentations				
5	Google Form can be used for assessment purposes and take online quizzes				
6	Google Classroom allows teacher to make online classrooms, upload teaching material and conduct online quizzes				
7	With Edmodo, teacher can share class announcements, learning materials, and make learning accessible anywhere				
8	Google Hangouts Meet connected teachers and students for teaching and learning.				
9	With Youtube Videos, teachers can make classroom channel and upload lecture videos.				
10	Using Screen Recorders, the teacher can make tutorial videos				

**Section C: Pre-service Teachers' Readiness of Digital Platforms for Professional Development**

S/N	Readiness	SD	D	A	SA
	I am competent in using:				

1.	Easyclass as digital platform for professional development				
2	Zoom Classroom as digital platform for professional development				
3	Microsoft Teams as digital platform for professional development				
4	Hypersay as digital platform for professional development				
5	Google Form as digital platform for professional development				
6	Google Classroom as digital platform for professional development				
7	Edmodo as digital platform for professional development				
8	Google Hangouts Meet as digital platform for professional development				
9	Youtube Videos as digital platform for professional development				
10	Screen Recorders as digital platform for professional development				

**Section D: Pre-service Teachers' Utilization of Digital Platforms for Professional Development**

<b>S/N</b>	<b>Utilization</b>	<b>SD</b>	<b>D</b>	<b>A</b>	<b>SA</b>
	I utilize:				
1.	Easyclass to create online classes course materials; manage assignments, quizzes, and exams; monitor due dates; grade results and provide students with feedback.				
2	Zoom Classroom for video conferencing, collaborations, virtual classrooms				
3	Microsoft Teams to keep team's chats, meetings, files, and apps together in one place.				
4	Hypersay for live interactive presentations				
5	Google Form for assessment purposes and take online quizzes				
6	Google Classroom to make online classrooms, upload teaching material and conduct online quizzes				
7	Edmodo to share class announcements, learning materials, and make learning accessible anywhere				
8	Google Hangouts Meet to connect to my students for teaching and learning.				
9	Youtube Videos to make classroom channel and upload lecture videos.				
10	Screen Recorders to make tutorial videos				