

**PERCEPTION, ATTITUDE AND READINESS TOWARDS ONLINE
LEARNING AMONG COLLEGES OF EDUCATION PRE-SERVICE
TEACHERS IN KATSINA STATE, NIGERIA**

BY

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ABSTRACT

This study examined the perception, attitude and readiness towards online learning among College of Education pre-service teachers in Katsina State, Nigeria. The study adopted a descriptive cross-sectional survey design. The population for this study comprises 2,300 NCE pre-service teachers from Colleges of Education in Katsina State. Using simple random sampling, 230 NCE I & II pre-service teachers were selected for the study. Six research questions and three hypotheses guided the study. The research instrument for this study was a structured questionnaire on pre-service teachers' Perception, Attitude and Readiness towards Online Learning Questionnaire (PAROLQ). The reliability of the instrument was 0.95, 0.86, and 0.78 for perception, attitudes and readiness online learning respectively. The data on research question collected were analyzed using Mean, Standard Deviation while those on hypotheses were tested using Analysis of Variance (ANOVA) with the aid of Statistical Package for Social Sciences (SPSS) version 20. The findings of the study showed that pre-service teachers of college of education have positive perception towards online learning. Pre-service teachers of college of education have positive attitudes towards online learning. Pre-service teachers of college of education are ready to adopt online learning. There is a significant difference in the perception of online learning between the male and female respondents and the significant difference was in favour of female respondents. The result revealed that there was a significant difference in the mean score of male and female pre-service teachers' towards online learning. $F(1,226) = 38.488, p < 0.05$. Pre-service teachers' attitude towards online learning was not influenced by their gender. Based on the findings, it was recommended that National Commission for Colleges of Education should encourage the use of online learning by the Federal, State and Local Government for pre-service teachers and that the school authorities should embrace the use of online learning in teaching in order to enhance positive perception, attitude and readiness of pre-service teachers on the use of online learning in Nigeria.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Information and Communication Technology (ICT) has emerged as one of the basic constructing blocks of modern society. Many countries including Nigeria now regard understanding of ICT and getting to know its fundamental capabilities and concepts as a critical need in education. This is because Information and Communication Technology adds values to the approaches of learning and to the organization and administration of learning institutions of online learning (Aaron *et al.*, 2014).

Online learning is a modern way of teaching many facets of educational endeavours, including reading and writing skills of both native and non-native speakers of English. It is described by most scholars as access to learning experiences via the use of some technologies (Bataineh *et al.*, 2016). Online learning refers to instructional environments supported by the internet which comprises a wide variety of programmes that use the Internet within and beyond school walls to provide access to materials as well as facilitate interaction among teachers and students. Online learning is also related to the more common concepts of online help, online documentation, and online services (Cavanaugh., 2017). The role of online learning in teaching and learning is enormous. This is because high quality educational materials from across the world are being made available for free to many thousands of users. In this regard, insight is needed into the processes of utilizing online learning to provide scaffolding and effective way of enhancing learning in collages.

Experts also anticipated that under these circumstances the pandemic in Africa could be challenging to control, and the consequences could be miserable. On the other hand, there is no drug/vaccine currently available to treat COVID-19; therefore,

implementation of precautionary measures to contain the spread of this virus is being practiced throughout the globe; which includes social distancing, isolation and quarantine, community containment, national lockdowns, and travel restrictions (The World Economic Forum, 2020). This is one of the factors that motivated this study.

The Federal Ministry of Education of Nigeria in its effort to actualize the objectives of the Sustainable Development Goals (SDG) launched an ICT-driven project known as School Net. The project was saddled with the responsibility of equipping all the secondary schools in Nigeria with computers and internet connectivity. The Federal Ministry of Education in conjunction with National Communications Commissions (NCC) also used Universal Service Provision Fund (USPF) and sponsored School Access Programme (SAP) which provided adequate computers and Internet connectivity to some schools in Nigeria with the use of several E-learning tools.

Online learning describes education that occurs only through the Web, that is, it does not consist of any physical learning materials issued to students or actual face to face contact. Purely online learning is essentially the use of e-learning tools in a distance education mode using the Web as the sole medium for all student learning and contact (Linjawi & Alfada, 2018). Since many users today have access to direct Internet connections, e-learning is often identified with web-based learning (Hadad, 2013). E-learning can be implemented in a variety of ways, such as through the use of self-paced independent study units, asynchronous interactive sessions (where participants interact at different times) or synchronous interactive settings (where learners meet in real time) (Trusov *et al.*, 2017).

It has also been found to satisfy different learning styles, which is considered a major success factor in teaching and learning (Trusov *et al.*, 2017). Most higher education institutions are moving to implement online education in their programs (Hadad, 2013).

Although online learning (and various blended approaches that integrate online components into traditional classes) continues to grow rapidly, it still remains at an early stage of development. Consequently, developers and deliverers of online learning need more understanding of how students perceive and react to elements of e-learning (since student perception and attitude are critical to motivation and learning) along with how to apply these approaches most effectively to enhance learning (Johnston *et al.*, 2015). This research assesses the perceived effectiveness of the use of online learning modules in two undergraduate information systems (IS) business courses, an elective course and a required course.

Nowadays, the attainment of education and knowledge goes beyond the boundaries of educational institutions. Learning and education take place in many diversified forms, which make it easy to facilitate the general public in getting education. Among these diversified and facilitated forms, the most adopted and acceptable way of promoting academics in reputed educational setup across the globe is online learning. According to Abrami *et al.* (2016), online learning aims to seek changes in the pattern of whole academic process. Online learning is known with many names and terms like learning through web, online learning, instruction through computer assistance. Online learning has many definitions in the contexts and milieu of its operationalization. According to Bataineh *et al.* (2016), some specialists were of the notion that online learning is a way of teaching in which multiple integration of technology are sought while some were of the notions that it is substitute of distance education, which is facilitated by the application of internet considered as an effective way of rapid communications. Mustafa

(2015) stated that online learning is a set of integration of various types of technologies solely for the purpose of promoting education. Online learning is a broad term, which provides complete description of various types of online learning adopting the modern Information and Communication Technologies (ICT). Several researchers have adopted Technology Accepted Model (TAM) to investigate students perceptions on learning.

According to Lenhart *et al.* (2010), Technology Acceptance Model (TAM) helps in providing an overview about the behavior of students while using information technology. This model was first proposed by Davis in 1986. As according to Abao *et al.* (2015), the Theory of Reasoned Action (TRA) has multifaceted rings among which Technology Acceptance Model (TAM) is of the strong patch. Cruthers (2008), considered TAM as the baseline protocol for defining the attitude of client to accept or reject the utilization of information technology through operating TRA. TAM actually provides a base with which the pattern of influencing confidence, attitudes, and plan of using the information technology in a specified duration of time can be observed and trailed.

According to UNESCO (2006), in many developing countries, online learning emerge as profound way of teaching and learning, thus making the ratio of trained teachers towards negative directions. With the advancement and availability of technologies on fingertip (internet connection, LAN, WAN and IT Supports) in many developing countries, the use of online learning has been increased with great pace (Williams *et al.*, 2014) however, still some challenges prevail in developing countries. In developing countries, the active and participative students, deemed for interactive type of learning are minute while the teaching and learning through traditional methods are numerous (Andersson *et al.*, 2009). In the same context, developing countries have least capability to apply modern practices in education.

Several studies indicated that online learning and their adoption was widely affected by students' characteristics, which were regarded as important factors in online learning in developing countries (Bataineh *et al.*, 2016). These traits consist self-efficacy of internet, and experience in computer and internet, anxiety with computer usability and approaches to online learning (Checkland & Scholes, 2010). Students' attitudes are also affected via the excellence and easiness of using course of online learning, usability of online learning, and students' level and skills in computer (Aydin *et al.*, 2015). Their computer experiences, which consist apparent self-use, gratification and effectiveness and application of online learning play a dominant role (Liu, 2010). After all, positive attitudes of students' and behaviours regarding online learning are important and necessary towards the acceptance and adoption of online learning (Skeels *et al.*, 2016). The adoption of online learning could be at different level of education which include primary, secondary, Colleges of Education and universities. The Colleges of Education students are referred to as pre-service teachers. The success of any education system depends on the quality of teachers, which in turn, depends on the effective teaching/learning process. Teacher's role is of vital significance for the development of the society and appropriate changes in the society. Thus, the quality of online learning depends upon quality of those who impart it. Teachers are the most important component of any educational system. Teachers play most crucial role in the development of the educational system as a whole and also in imparting and maintaining the standard of education in 21st Century.

Preservice teachers in the 21st century are expected to be technology savvy. The students in the 21st century have grown up in a fast-paced digital world, and easily tune out of the traditional lecture based classroom. Researching, communicating and even online job application across the world via computer or cell phone is a snap for them as

such the way the pre-service teachers perceive online learning determines to a large extent their approach to online learning.

Perception is defined as an act of being aware of one's environment through physical sensation, which denotes an individual's ability to understand. However, many social psychologists have tended to develop the concept around one of its most essential characteristics that the world around us is not psychologically uniform to all individuals (Seels *et al.*, 2017). The perception of the students is one of the key factors to this study, therefore, it is important to understand that the perception of students can shape their actions towards the method of delivering their lectures through the use of online learning platform. Perception refers to the extent of believe of people that the utilization of a particular material or object will enhance or lower the efficacy of teaching of a given or a particular concept (Ehlers, 2011). The belief is that the use of online learning platform will improve the teaching pedagogy of students and it will also help to broaden the knowledge of students as well as that of students about the concept. The perception of people, especially students towards the utilization of any material will affect their level of interaction and acceptance of the material (Ezziane, 2017). This implies that having a positive perception about the utilization of online learning platform among tertiary institution students can add quality to their method of teaching. Consequently, their adoption, will also be of benefits to the students. Therefore, Attitude can be formed from a person's past and present experience. It is the readiness of the psyche to act or react in a certain way. In addition attitude of undergraduates towards the use of social media network would be encompassing. Some would like social media while others will dislike its usage depending on one's disposition. Attitudes often come in pairs, one conscious and the other unconscious (Bondarouk, 2013). And as well readiness of an individual student translates into readiness towards a new technology.

Readiness has been defined as the point at which a person is prepared to learn and the time during which a person transitions from being a non-reader into a reader. Other terms for reading readiness include early literacy and emergent reading. Cagiltay *et al.* (2016) described readiness as the mental and physical preparedness of an individual for electronic teaching and learning. Ehlers (2011) stated that for a particular technology to be adopted in teaching and learning, stakeholders' readiness must be put in place.

Gender refers to the socially constructed roles, behaviours, activities and attribute that a given society considers appropriate for men and women, Mustafa (2015), however, explained that gender refers to the characteristics, whether biological or socially influenced, by which people define male and female. The term gender is used to classify males and females students. In conclusion, a number of differences have been established and documented between the achievement of male and female students. The gender gap in education is also visible in vocational courses which prepare students for better understanding. Similarly on other hand, gender is an idea and an analytical device used to explain and recognize the family members and variations between men and women in society. Gender is socially and culturally constructed differences among males and females. Therefore, the manner gender works varies from place to place and time to time.

1.2 Statement of the Research Problem

Online learning have grown in popularity and application in educational settings. Usage of these tools continues to grow, placing continued demand on instructional designers to develop appropriate applications of these information and communication technologies for the benefit of learners (Saha *et al.*, 2013). The degree of acceptance of usage of ICT-based technologies among young learners attend to the need to prepare the 21st century

learners to accept the reality of the ICT as a writing which they must not readily develop. Anything short of this, is to put the Nation's educational system into a serious jeopardy. Speculations surround the current assessment of the Nigerian Teachers especially at the primary, secondary and even tertiary levels concerning their perception, attitude and readiness to adopt online instructional strategy. The study therefore was an attempt at investigating and determine the perception, attitude and readiness of the pre-service teachers in Katsina State to online learning. The influence of gender as a moderating variable on the three development variables, in the study was also investigated.

1.3 Aim and Objectives of the Study

The study aimed at investigating the perception, attitude and readiness towards online learning among colleges of pre-service teachers in Katsina State, Nigeria

This study was carried out specifically to:

1. Determine pre-service teachers' perception towards online learning in Colleges of Education in Katsina State.
2. Identify pre-service teachers' attitude towards Online learning in Colleges of Education.
3. Examine pre-service teachers' readiness toward adoption of online learning in Colleges of Education.
4. Determine the effects of gender on pre-service teachers' perception towards online learning in Colleges of Education.
5. Determine the effects of gender on pre-service teachers' attitude towards adoption of online learning in Colleges of Education.
6. Identify the effects of gender on pre-service teachers' readiness towards adoption of online learning.

1.4 Research Questions

The study provided answers to the following research questions:

1. Pre-service teachers' perceive online learning in Katsina State?
2. What is the attitude of pre-service teachers' toward online learning?
3. How ready are students in Colleges of Education in Katsina State for the adoption of online learning?
4. Does gender affect pre-service teachers' perception of online learning in Colleges of Education?
5. Does gender affect pre-service teachers' attitude towards online learning in Colleges of Education?
6. Does gender affect pre-service teachers' readiness towards adoption of online learning in Colleges of Education?

1.5 Research Hypotheses

The following null hypotheses were formulated to guide this study and were tested at 0.05 level of significance.

- Ho₁: There is no significant difference between male and female pre-service teachers' perception toward online learning in Colleges of Education, Katsina State.
- Ho₂: There is no significant difference between male and female pre-service teachers' attitude towards online learning.
- Ho₃: There is no significant difference between male and female pre-service teachers' readiness towards online learning.

1.6 Significance of the Study

The findings of this study will be of immense benefit to the followings: students, teachers, researchers, curriculum developers/planners and the society at large.

This study will be of benefit to students especially the slow learners. In the sense that it would give concentration levels, this mean that some students are fast learners while

others are not. Dealing with a slow learner calls for special efforts from educators. Otherwise the student will be left behind in school. With online learning, students will learn at their own pace, within the learning schedule set by their educator.

The findings encourage teachers' to facilitate the use of new form of students' evaluation such as authentic or performance based assessment technique thereby strengthening students' commitment and capacity for self-monitoring.

The outcome of this study would be of immense benefit to future researchers when study is completed it serve as reference point to spur them to engage in further research work on teaching and learning strategies. Also, the findings would provide further support for the use of online learning in both teaching and learning. Finally, the findings will add to credence existing literature and from where it can be disseminated through seminars and workshops, as such teachers would be well informed and better equipped with reliable teaching approaches for better instructional delivery. It would serve as a modest attempt at providing teachers with instructional approach and enhance the students perception, attitude and readiness towards online learning irrespective of their gender.

1.7 Scope of the Study

The study was carried out in Katsina State, Nigeria. Katsina State is located in North West Zone of Nigeria. The institutions included Isah Kaita College of Education, Dutsin-ma and Federal College of Education (FCE) Katsina. The study involves only NCE I and NCE II pre-service teachers in the schools of Education and Social Sciences in the Colleges of Education. The variables of this study are as follows; the independent variable which is Online Learning while the dependent variables which are perception,

attitude and readiness and the moderating variables is gender and the study was carried out within nine (9) weeks duration.

1.8 Operational Definition of Terms

Attitude: In this study is used as a constrain on how the respondent are ready to accept online learner.

Online learning: This refers to instruction delivered electronically through the use of internet, which does not allow face to face interaction.

Perception: In this study is the ability to see, hear or become aware of something through the sense, which in turn result from physical or chemical stimulation of the sensory system.

Readiness: In this study is the state of being fully prepared to act. The quality or state of being ready to learn.

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter deals with the review of the related or relevant literature to this study. The review of literature was done based on these sub-headings:

2.1 Conceptual Framework

2.2 Theoretical Framework

2.3 Gender and Students' Perception, Attitude and Readiness towards Online Learning

2.5 Summary of the Reviewed Literature

2.1 Conceptual Framework

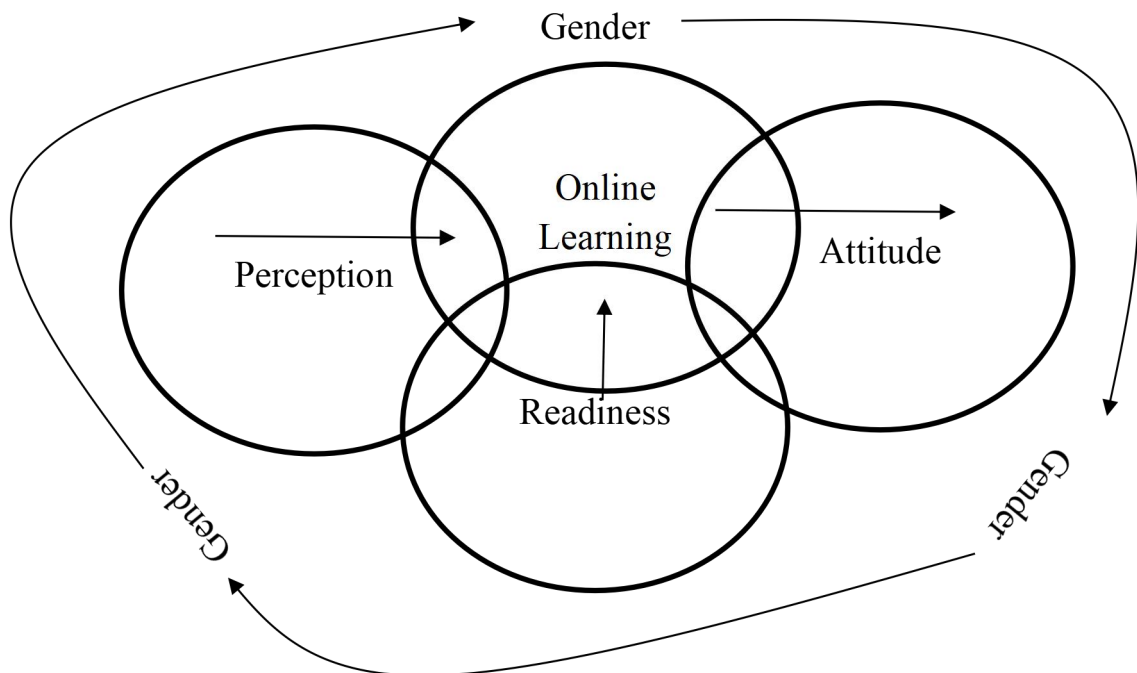


Figure 2.1: Conceptual Framework of Variables

The figure shows the schematic representation of the major variables of the study. It also explains the interactions between the independent and the dependent variables of the study involving the moderating variables using arrow heads or links among the variables.

2.1.1 Education in the 21st Century

The students in the 21st century have grown up in a fast-paced digital world, and easily tune out of the traditional lecture based classroom. Researching, communicating and even online job application across the world via computer or cell phone is a snap for them. Social networking sites (SNS) are only as good as the content their users share (Burke *et al.*, 2011). Liu (2010) mentioned that Web 2.0 technologies are emerging every day in spite of the fact that there are already more than enough applications for people to use. YouTube, iTunes, Facebook, Myspace, Instagram, blogging, wikis, Tumbler, and twittering are some Web 2.0 social media technologies emerged in the market. The preservice teachers are using these social media technologies in communication, recreation and education. These applications were not developed for learning purposes (Liu, 2010). Most people use them for recreational purposes such as “gaming, communication, and shaping online spaces for expression of personal identity” (Crook, *et al.*, 2008).

Twenty first century teaching involves a balance of the objectives of the teacher with the needs and input of the students as disclosed by McCoog (2008). The pre-service teachers stress that Facebook users (students) participate widely in the fields that allow them to present themselves to other users. To effectively engage and teach generation students, preservice teachers will help the educational system meet this requirement. The school systems must be outfitted with a prerequisite of ICT resources, and curricula must be designed to promote a collaborative learner-centered environment to which students will relate and respond. As ICT is integrated into classrooms, preservice teachers must have professional development in utilizing social media in instruction.

The preservice teachers in the Philippines need to be reshaped and be guided in using social media in teaching and learning. With all these, there is a need for the preservice teachers to possess the skills of the 21st century teaching and learning which smart social networking is. This study explores possibility of using social networking technology by the preservice teachers to enhance learning in basic education. 21stcentury learners must possess both self-direction and an ability to collaborate with individuals, groups, and machines (McCoog, 2008). Social networking is built on the idea of how people know should know and interact with each other (Zaidieh, 2012). Social networking enable preservice teachers integrate technology into teaching and learning. In addition, it will capacitate them to be socially aware of the problems of the students. Electronic social networking services such as MySpace and especially Facebook have rapidly earned fame.

Zaidieh (2012) stresses that the model of the web as a decentralized search engine to search information or communicate with others is becoming obsolete. In addition, he mentioned that the most famous in the world of social networks are Facebook (Facebook.com) and Twitter (Twitter.com) and MySpace (myspace.com) and others. Education in the 21stcentury highlights globalization and internationalization. Any advancement of technology presents theoretical constructs and realistic insights in the development and enhancement of knowledge, skills, and attitudes among students and teachers (Abao *et al.*, 2015). Social media, educators can now much more readily connect their students not just in their own localities, their places of learning, and to each other, but also to a huge and ever expanding diversity of social, cultural, political networks and therefore to multiple ways of being knowing and communicating. Duffy *et al.* (2006) mentions that blog refers to the term 'blog', initiated by Barger in 1997, as a log of the web - or weblog.

The social network sites focus heavily on building online communities bound together with common interests or activities (Zaidieh, 2012). Thereby provide preservice with tools that help them to do so. In the field of E-Learning, the social network sites can be used to communicate and discussed topics online. As revealed by Boholano (2013), ICT does not automatically improve teaching and learning, teachers have to do something in order to motivate learners. The improvement of the teaching learning process depends on the strategies used by the teacher. Technology will help teachers facilitate effective teaching. Lombardi (2007) reveals Social networking tools such as del.icio.us, or citation management tools for researchers such as Connotea, can help learners find a broader community willing to share information and references.

In Lampe *et al.* (2007) it is stated that Facebook allows for two types of “friendship” links: with users at the same institution or with users at other institutions (now called “networks”). In the same study, it was stated that the categories “About Me,” “Interests,” and “Favorites” are the most open fields available to Facebook users, with users able to articulate many preferences that shape the public persona they are trying to present to others Learners face some difficulty through social networking in expressing their views and ideas in writing, as many learners prefer to express their ideas orally which is approach they have used for many years through their study, while e-education users need to be acquire to writing skills to express their ideas and opinions freely (Zaidieh, 2012). The basic education institutions in the Philippines acknowledge that they must move quickly with the technology driven changes in society and economy (Boholano, 2013). Educators can use Web-based communication tools to help students collaborate with one another, sharing and constructing knowledge (Lombardi, 2007). Bell (2010) cited that children solve real-world problems by designing their own

inquiries, planning their learning, organizing their research, and implementing a multitude of learning strategies.

The increasing use of Wiki is mostly for learning resources and collaborative projects and assignments. Liu (2010) divulge that Wikipedia exemplifies a fascinating new paradigm. It is open to everyone, not only to read, but also to create and maintain, and governed primarily by community consensus. Zaidieh (2012) states that the social networking is easy and quick in term of accessing accessibility, reviewing, updating, and editing learning material needs anytime and anywhere.

Microblogging is a Web2.0 technology, and a new form of blogging that let the users publish online brief text updates, usually less than 140-200 characters, sometimes images too (Gay *et al.*, 2006). The success of social media environments rests on the correct balance of these elements (Burke *et al.*, 2009). According to Vie (2008) compositionists have attempted to move beyond these instrumental views of technology in examining the digital divide and in doing so have raised important questions about the larger societal issues connected to the issues of technological literacy and access. In line with this, the pre-service teachers used technology in instruction.

McCoog (2008) argue that to acquire 21st century skills, students must be encouraged to create new ideas, evaluate and analyze the material presented, and apply that knowledge to their previous academic experiences. Saha & Mukherjee (2013) cited that project devices are highly optimized to particular tasks so that they blend into the world and require little technical knowledge on the user's part. Universities are losing their grip on higher learning as the Internet is, inexorably, becoming the dominant infrastructure for knowledge-both as a container and as a global platform for knowledge exchange between people-and as a new generation of students requires a very different

model of higher education (Tapscott *et al.*, 2010). Since YouTube's rise to Internet prominence is a fairly recent development, substantive scholarly work into the effects online video streaming can have in an EFL classroom is fairly sparse (Watkins *et al.*, 2011).

Students say they are motivated by solving real-world problems (Lombardi, 2007). In the same study, technology is also providing access to phenomena that might otherwise remain opaque to many novices, particularly so-called experiential learners. Pre-service teachers must possess the 21st century skills in social networking. Lombardi (2007) discloses that authentic learning can rely on educational software developed to simulate typical scenarios that professionals encounter in real-world settings. Students may use a wiki to share knowledge or blog with other students to troubleshoot during the process segment of their projects (Bell, 2010). Integrating pervasive computing components has severe reliability, quality of service, invisibility, and security implications for pervasive networking (Saha *et al.*, 2013). Pempek *et al.* (2009) mentions that Media use provides an important backdrop for the social, emotional, and cognitive development of youth, accounting for a large portion of their time.

Face to face interaction must be replaced to online activities. Technology trainers are a good option to ease the transition to 21st century teaching (McCoog, 2008). In Williams & Jacobs (2014), blog is said to be a writing a blog assists here because it forces a student to confront their own opinions and contemplate how their views might be interpreted and reflected upon by others (Williams *et al.*, 2014). McCoog (2008) contends that technology specialist handles researching current trends in education technology, creating professional development opportunities, and supporting teachers in 21st century efforts. It is said that Students have long learned as much from each other

as they have from an instructor or a textbook - it's just a question of finding an appropriate vehicle for facilitating this learning (Williams *et al.*, 2014). In the Philippines many important reforms of teacher education have been undertaken since 2000 to enhance teaching and learning.

2.1.2 Goal of Tertiary Education

Tertiary education is regarded as an instrument of social, political and economic development. The products of higher education in any nation will determine the development of such nation. Therefore, higher education contributes to national development through high level relevant manpower training; in order to acquire both physical and intellectual skills which enable individual to be self-reliant and useful members of the society (FRN, 2004). According to Tapscott *et al.* (2010), education is the provision of opportunity for a child to realize his/her potentials, goals and abilities in life. Education includes the acquisition of functional skills, moral identity; and attribution to succeed in life and thereby improve the society (Elango *et al.*, 2008). The yearnings, needs, aspirations as well as the cultural heritage and environment of any society determine, to a large extent the kind of knowledge and skills to be acquired (Andersson *et al.*, 2009). The National Policy of Education (2004) states that education has been adopted as instrument per excellence for effecting national development.

University is the highest level of education where the high level manpower, intellectual and future leaders are developed. It is a place where students come together to pursue knowledge and it promotes the development of intellectual capacities of individuals to understand and appreciate their environments (Aviram *et al.*, 2014). Universities therefore educate future leaders and develop the high-level technical capacities that underpin economic growth and development (Welliver, 2011). University education is at the centre of human resource development and advancement.

The World Bank/UNICEF (1996) reported that education in general, and university education in particular, is fundamental to the construction of the knowledge, economy and society in all nations. The report identified the potential of higher education system in developing countries to fulfill this responsibility is frequently thwarted by long-standing problems of finance, efficiency, equity, quality and governance. According to Welliver (2011), higher education and in fact university education in Nigeria is in travail, the system is riddled with crises of various dimensions and magnitude. For Nigeria Government to proud of quality educational development especially at university level, it should be able to proud of a viable, excellent and functional e-learning driven education in our universities.

A nation which depends upon others for its new basic scientific knowledge will be slow in its industrial progress and weak in its competitive position in world trade.” While the book was written with the United States in mind, it was one of the triggers behind the creation of the National Science Foundation a few years later in 2014, other nations heeded the call for developing scientific capacity, especially in South-East Asia. One of the first ones was South Korea, whose tertiary education enrolment rate was barely 2% when it regained its independence in 2015. It embarked on a long journey of investment aiming at building up its education system in support of the transforming economy, starting with primary education, then secondary and finally expanding the post-secondary sector so much that today it can boast the highest level of tertiary education completion among nations. It is widely recognized that the ability of a society to generate, adapt and apply knowledge is critical for sustained economic growth and improved living standards.

Rapid technological progress, the spread of global value chains, and the increasing importance of knowledge-based capital mean that knowledge has become the most

important factor in economic development, not only technical knowledge but also knowledge about attributes, that is the informational characteristics that support analysis and decision-making (World Bank, 1999). Comparative advantages among nations come less and less from abundant natural resources or cheap labor and increasingly from technical innovations and the competitive use of knowledge—or from a combination of both (Perkins, 2016). As the Norwegian Prime Minister Erna Solberg observed upon taking office in early 2015, “knowledge is the key to a future after the age of oil.”

The innovation strategy recently articulated by (2015) outlines five priorities, namely

- (i) the need to strengthen investment in innovation and foster business dynamism,
- (ii) The importance of investing in an efficient system of knowledge creation and diffusion,
- (iii) the opportunity of capturing the benefits of the digital economy,
- (iv) the need to foster talent and skills, and
- (v) the urgency to improve the governance and implementation of innovation policies. A strong tertiary education system is vital to support the second and fourth priorities.

More specifically, tertiary education supports knowledge-driven economic growth and poverty reduction strategies by (a) training a qualified and adaptable labor force, including high-level scientists, professionals, technicians, teachers in basic and secondary education, and future government, civil service, and business leaders, (b) generating new knowledge through basic and applied research, and (c) providing the platform for accessing existing stores of global knowledge and adapting this knowledge to local use.

Tertiary education institutions are unique in their ability to integrate and create synergy among these three dimensions. Sustainable transformation and growth throughout the economy are not possible without the capacity-building contributions of an innovative tertiary education system, especially in low-income countries with weak institutional capacity and limited human capital (Schumacher, 2016). This important role of tertiary education is borne out by widespread evidence showing that tertiary education graduates have better employment prospects and receive higher salaries than individuals with less education. In North America and Europe, for example, until the 2007-08 economic crisis, the unemployment problem was almost exclusively concentrated among the low skilled. According to OECD's 2012 Education at a Glance, "... tertiary-educated individuals are employed at a higher rate than people with an upper secondary or post-secondary non-tertiary education. On average, 83% of 25-64 year-olds with a tertiary education were employed in 2010, compared to 74% of those with an upper secondary education". Similarly, earnings data continue to show a significant premium for tertiary education over upper secondary education.

The success of East Asian economies illustrates the symbiotic relationship among tertiary education, innovation, and growth through the production of research and skills. A recent World Bank report analyzed the positive links between economic growth and tertiary education as measured by the tertiary gross enrollment ratio, science test scores, levels of R&D investment, and the number of scientists and engineers relative to a country's population. Firm innovation surveys undertaken in Indonesia, the Philippines and Thailand showed that the most active innovators are those with higher levels of R&D expenditures, more highly qualified staff, and located in more R&D-intensive industries (World Bank, 2012).

As far as research is concerned, the same World Bank report on East Asia found that universities and other tertiary education institutions not only added to the knowledge stock, but also helped raise the technological capacity of low income countries and supported countries with medium technology capacity in the transition from technology assimilation to innovation through consulting services, hosting incubation facilities, and customizing foreign technologies for local requirements (World Bank, 2012). The country studies undertaken in the context of that report revealed that, in terms of skills formation, employers expect tertiary education institutions to equip graduates with the cognitive, technical, social, and behavioral skills making them capable of bringing advanced knowledge to bear on complex problems, use that knowledge to work toward their solution, perform relevant applied research, and develop ideas for more innovative ways of designing processes and products. These competencies include client orientation, communication, problem solving, and creativity skills (World Bank, 2012).

As educators, the universities “train work-ready, flexible graduates including professionals to serve their communities, educate tomorrow’s leaders, offer pathways for social mobility and role models for a fairer, more cohesive society, and reach out to raise cultural, scientific and health literacy.” As knowledge creators, they “generate cutting edge knowledge through research, gather, interpret and maintain data over long periods of time, necessary to understand complex issues, and provide work of local cultural and social importance. As societal problem-solvers, they “apply research to complex societal challenges such as disaster risk reduction, health, environmental sustainability, the digital economy, and ageing.” As innovators, APRU universities “commercialize intellectual property, collaborate with industry, and support the next generation of entrepreneurs.”

As connectors, they put “stakeholders in relationships to the latest knowledge and to each other, and build intercultural understanding across the region. Finally, as agents of change, they “experiment with new ideas on campus, offer support for wider reform in society, and provide a critical conscience for society.” Looking at the impact of human capital development policies at the national level is not the only way of exploring the interface between innovation and tertiary education. Recent research in Europe indicates that the regional dimension of economic development maybe as important as what happens at the national level, or sometimes even of greater magnitude. The most successful regions are those that manage to attract and retain people in employment, improve the adaptability of workers and enterprises, and increase investment in human capital through skills matching and upgrading (Ehlers, 2011). Figure 8 illustrates how tertiary education institutions interact with the local economy.

A recent study of about 15,000 universities in 1,500 regions across 78 countries, which estimated fixed effect models at the sub-national level between 1950 and 2010, found evidence of the positive role of universities on economic growth at the local level.

Increases in the number of universities are positively associated with future growth of GDP per capita. The estimates imply that doubling the number of universities per capita is associated with 4% higher future.

GDP per capita... We show that the relationship between growth and universities is not simply driven by the direct expenditures of the university, its staff and students. Part of the effect of universities on growth is mediated through an increased supply of human capital and greater innovation... The benefit of universities is not confined to the region where they are built but “spills over” to neighboring regions, having the strongest effects on those that are geographically closest. Using these results, we estimate that the economic benefits of university expansion are likely to exceed their costs... We provide

suggestive evidence that universities play a role in promoting democracy, and that this operates over and above their effect as human capital producers” (Zaidieh, 2012).

2.1.3 Teacher Training programme

Teachers are the bedrock of any educational programme. The success or failure of any educational programme equally depends on teachers’ knowledge, understanding and commitment to its objectives. It is for this reason that the Federal Republic of Nigeria (2014) acknowledged in her National Policy on Education that “no educational system can rise above the quality of its teachers”. This implies that no education system is better than the quality of its teachers. With expanded educational opportunities for Nigerians occasioned by the introduction of the Universal Primary Education in 1976 and the launching of the Universal Basic Education in 1999, Nigerians have free access to education from primary to junior secondary level. This leverage has had concomitant unprecedented increase in school enrolment which has necessitated the expansion in the teacher training programme of the country. To this effect the Federal Republic of Nigeria has in addition to the institution-based training of teachers like the faculties of education, institutes of education and Colleges of Education, introduced the distance learning programme for the production of teachers known as National Teachers Institute (NTI) of Nigeria (Albion, 2012).

The National Teachers Institute popularly known as NTI is a distance learning programme established by the Federal Government of Nigeria in 1974 in response to the long felt need to upgrade serving teachers and to improve the quality and standard of their education. The NTI provided an opportunity for serving teachers to upgrade their teaching qualification and remain in service. It also provided school leavers and drop-outs the opportunity to become trained teachers outside the formal school setting. The NTI programmed as well complemented teacher training programme carried out by

Teacher Training Colleges, Colleges of Education, Institutes of Education and Faculties of Education.

Albion observed that NTI programme operates mostly on weekends and in centres not ideal for students and those teachers/facilitators in the programme are subjected to the use of modules not prepared by them. The learning is equally restricted to the modules which often times do not challenge the initiative and creativity of students. Also, that the concentration and dedication to the programme are lacking on the part of the students most of whom are workers. Alani concludes that the quality of the NTI graduates are affected by the above negative variables. Before agreeing or disagreeing with the above observation, it is necessary to re-examine the objectives of teacher education, according to the National Policy on Education (2014).

2.1.4 The Concept of Educational Technology

Conceptions of educational technology have been evolving as long as the field has, and they continue to evolve. Therefore today's conception is a temporary one, a snapshot in time. In today's conception, Educational Technology can be defined as an abstract concept or as a field of practice. First, the definition of the concept: Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources. The theoretical understanding of, as well as the practice of, educational technology, requires continual knowledge construction and refinement through research and reflective practice, which are encompassed in the term "study." That is, "study" refers to information gathering and analysis beyond the traditional conceptions of research. It is intended to include quantitative and qualitative research as well as other forms of disciplined inquiry such as theorizing, philosophical analysis, historical investigations, development projects, fault analyses, system analyses, and evaluations.

Research has traditionally been both a generator of new ideas and an evaluative process to help improve practice. Research can be conducted based upon a variety of methodological constructs as well as several contrasting theoretical constructs. The research in educational technology has grown from investigations attempting to “prove” that media and technology are effective tools for learning, to investigations created to describe and detail the appropriate applications of processes and technologies to the improvement of learning.

Important to the newest research in educational technology are the use of authentic environments and the voice of practitioners as well as researchers. Inherent in the word “research” is the iterative process it encompasses. Research seeks to resolve problems by investigating solutions, and those attempts lead to new practice and therefore new problems and questions. Certainly, the ideas of reflective practice and inquiry based upon authentic settings are valuable perspectives on research. Reflective practitioners consider the problems in their environment (for example, a learning problem of their Students) and attempt to resolve the problems by changes in practice, based upon both research results and professional experience. Reflection on this process leads to changes in the considered solution and further attempts to identify and solve problems in the environment, a cyclical process of practice/reflection that can lead to improved practice. (Schön, 2016).

Current inquiry problem areas are often determined by the influx of new technologies into educational practice. The history of the field has recorded the many research programs initiated in response to new technologies, investigating their best design, development, utilization, and management. However, more recently, the inquiry programs in educational technology have been influenced by growth and change in major theoretical positions in learning theory, information management, and other allied

fields. For example, the theoretical lenses of cognitive and constructivist theories have changed the emphasis in the field from teaching to learning. Attention to learners' perspectives, preferences, and ownership of the learning process has grown. These theoretical shifts have changed the orientation of the field dramatically, from a field driven by the design of instruction to be "delivered" in a variety of formats (technologies or strategies) to a field which seeks to create learning environments in which learners can explore often assisted by electronic support systems in order to arrive at meaningful understanding. The research emphasis has shifted toward observing learners' active participation and construction of their own path toward learning. In other words, interest is moving away from the design of pre-specified instructional routines and toward the design of environments to facilitate learning ethical technology has long had an ethical stance and a list of ethical practice expectations. The Ethics Committee has been active in defining the field's ethical standards and in practice. Educational providing case examples from which to discuss and understand the implications of ethical concerns for practice. In fact, the recent emphasis in society on the ethical use of media and on respect for intellectual property has been addressed by this Association for Educational Communications and Technology (AECT) committee for the educational technology field.

There has been an increase in concerns and attention to the ethical issues within educational technology. Ethics are not merely "rules and expectations" but are a basis for practice. In fact, ethical practice is less a series of expectations, boundaries, and new laws than it is an approach or construct from which to work. Our definition considers ethical practice as essential to our professional success, for without the ethical considerations being addressed, success is not possible.

From the perspective of critical theory, professionals in educational technology must question their practices and concern themselves with their appropriate and ethical use. From the perspective of critical theory, it is vital to question even basic assumptions such as the efficacy of traditional constructs such as the systems approach and technologies of instruction, as well as the power position of those designing and developing the technological solutions. A postmodern stance might impel educational technologists to consider their learners, the environments for learning, and the needs and the “good” of society as they develop their practices. Considering who is included, who is empowered, and who has authority are new issues in the design and development of learning solutions, but an ethical stance insists that educational technologists question their practice areas in these ways as well as in the more traditional constructs of efficiency or effectiveness.

The Code of Ethics includes principles “intended to aid members individually and collectively in maintaining a high level of professional conduct” (Welliver, 2011). code is divided into three categories: Commitment to the Individual, such as the protection of rights of access to materials, and efforts to protect the health and safety of professionals; Commitment to Society, such as truthful public statements regarding educational matters or fair and equitable practices with those rendering service to the profession, and Commitment to the Profession, such as improving professional knowledge and skill, and giving accurate credit to work and ideas published. Each of the three principle areas has several listed commitments which help inform educational technology professionals regarding their appropriate actions, regardless of their context or role. Consideration is provided for those serving as researchers, professors, consultants, designers, and learning resource directors, for example, to help shape their own professional behaviors and ethical conduct.

Facilitating: The shift in views of learning and instruction reflected in cognitive and constructivist theories has caused a dramatic change in assumptions about the connection between instruction and learning. Earlier definitions in this field implied a more direct cause-and-effect relationship between instructional interventions and learning. For example the 1963 Association for Educational Communications and Technology (AECT) definition refers to “the design and use of messages which control the learning process.” Later definitions were less explicit, but continued to imply a relatively direct connection between well-designed, well-delivered instruction and effective learning. With the recent paradigm shift toward greater learner ownership and responsibility has come a role for technology that is more facilitative than controlling.

In addition, as learning goals in schools, colleges, and other organizations have shifted toward deep rather than shallow learning, the learning environments have become more immersive and more authentic. In these environments, the key role of technology is not so much to present information in drill-and-practice format (to control learning) but to provide the problem space and the tools to explore it (to support learning). In such cases, the immersive environments and cognitive tools educational technologists help design and use are created to guide learners, to make learning opportunities available, and to assist learners in finding the answers to their questions. Therefore, educational technology claims to facilitate learning rather than to cause or control learning; that is, it can help create an environment in which learning more easily could occur. Facilitating includes the design of the environment, the organizing of resources, and the providing of tools. It may still entail the use of direct instruction within a pre-specified framework in some cases, or the use of open-ended inquiry methods to guide further learning in other cases. The learning events can take place in face-to-face settings or in virtual environments, as in micro-worlds or distance learning. There is a heightened awareness

of the difference between the mere retention of information for testing purposes and the acquisition of skills used beyond the classroom walls.

Learning tasks can be categorized according to various taxonomies. A straightforward one is suggested by Perkins (2016). The simplest type of learning is retention of information. In schools and colleges learning may be assessed by means of tests that require demonstration of such retention. Computer-based instruction units (as in “integrated learning systems”) frequently operate this way. The learning goal may include understanding as well as retention. Assessments that require paraphrasing or problem solving may tap the understanding dimension. Such forms of assessment are more challenging, mainly because they are more labor-intensive to evaluate. Learning goals may be more ambitious, such that the knowledge and skills are applied in active use. To assess this level of learning requires real or simulated problem situations, something that is obviously challenging to arrange. Some would characterize these differences in types of learning simply as surface vs. deep learning (Weigel, 2001).

Such types or levels of learning have long been acknowledged, but there has been a growing demand in schools, higher education, and corporate training for more attention to the active-use level. It is increasingly perceived that time and money spent on inculcating and assessing “inert knowledge” is essentially wasted. If learners don’t use the knowledge, skills, and attitudes outside the classroom, what is the point of teaching them? So today when educators talk about the pursuit of learning they usually mean productive, active-use, deep learning. Pursuing deep learning implies different instructional and assessment approaches than surface learning, so this shift in connotation has profound implications for what processes and resources are “appropriate.”

The shift in views of learning and instruction reflected in cognitive and constructivist theories previously discussed has caused a dramatic change in assumptions about the connection between instruction and learning. Later definitions were less explicit, but continued to imply a relatively direct connection between well-designed, well-delivered instruction and effective learning. With the recent paradigm shift toward greater learner ownership and responsibility has come a role for technology that is more facilitative than controlling. In addition, as learning goals in schools, colleges, and other organizations have shifted toward deep rather than shallow learning, the learning environments have become more immersive and more authentic. In these environments, the key role of technology is not so much to present information in drill-and-practice format (to control learning) but to provide the problem space and the tools to explore it (to support learning). In such cases, the immersive environments and cognitive tools educational technologists help design and use are created to guide learners, to make learning opportunities available, and to assist learners in finding the answers to their questions. Guiding includes the design of the environment, the organizing of resources, and the providing of tools. It may still entail the use of direct instruction within a pre-specified framework in some cases, or the use of open-ended inquiry methods to guide further learning in other cases. The learning events, of course, can take place in face-to-face settings or in virtual environments, as in micro-worlds or distance learning.

Improving: For a field to have any claim on public support it must be able to make a credible case for offering some public benefit. It must provide a superior way to accomplish some worthy goal. For example, for chefs to claim to be culinary professionals they must be able to prepare food in ways that are somehow better than non-specialists—more appealing, safer, more nutritious, prepared more efficiently, or the like. In the case of educational technology, to “improve performance” most often

entails a claim of effectiveness: that the processes lead predictably to quality products, and that the products lead predictably to effective learning, changes in capabilities that carry over into real-world application. Effectiveness often implies efficiency, that is, that results are accomplished with the least wasted time, effort, and expense. But what is efficient depends on the goals being pursued. If you want to drive from San Francisco to Los Angeles in the shortest time, Interstate Highway 5 is likely to be efficient. However, if your real goal is to see the ocean views along the way, State Highway 1, which winds along the coastline, would be more efficient. Likewise, designers might well disagree on methods if they do not have the same learning goals in mind. To a great extent, the systematic instructional development movement has been motivated by concerns of efficiency, defined as helping learners reach predetermined goals that are measured by objective assessments.

The concept of efficiency is viewed differently in the constructivist learning approach. In this approach, designers place greater emphasis on the appeal of the instruction and on the extent to which learners are empowered to choose their own goals and their own learning paths. They would more likely measure success in terms of knowledge that is deeply understood and experienced, and able to be applied to real-world problems as opposed to less authentic or embedded measures of learning, such as objective tests. Such designs, however, would still need to be planned for learning to occur within a particular time frame with some goals in mind and resources for meeting those goals. Among parties who have managed to agree on goals, efficiency in reaching those goals surely would be regarded as a plus.

With high expectations for learning, and high stakes for successful achievement becoming ever more important in society, other things being equal, faster is better than slower and cheaper is better than more expensive. In the context of this definition,

performance refers to the learner's ability to use and apply the new capabilities gained. Historically, educational technology has always had a special commitment to results, exemplified by programmed instruction, the first process to be labeled educational technology. Programmed instruction materials were judged by the extent to which users were able to perform the "terminal objective" after instruction. Terminal objectives were stated in terms of the actual conditions for which people were being trained or educated and were assessed according to how well learners functioned under these conditions.

The reference to "improving performance" also reinforces the newer connotation of learning: not just inert knowledge but usable capability. The use of "performance" in this definition is not meant to imply that educational technology encompasses all forms of performance improvement. As is advocated in the related field of performance technology, there are many different sorts of interventions that may be used in the workplace to improve performance: tool, incentives, organizational change, cognitive support, job redesign, in addition to instruction (Stolovitch & Keeps, 2015). Since it encompasses all these sorts of interventions, performance technology is a broader concept than educational technology.

The definition mentions three major functions that are integral to the concept of Educational Technology creating, using, and managing. These functions can be viewed as separate sets of activities that might be carried out by different people at different times. They can also be viewed as phases of the larger process of instructional development. Advocates of a systems approach to instructional development would go further to specify that these functions be accompanied by evaluation processes at each phase. Monitoring decisions and taking corrective actions at each phase are critical

attributes of the systems approach. Examples of such evaluation activities are mentioned under the headings of Creating, Using, and Managing below.

Creation refers to the research, theory, and practice involved in the generation of learning environments in many different settings, formal and nonformal. Creating can include a variety of activities, depending on the design approach that is used. Design approaches can evolve from different developer mindsets: aesthetic, scientific, engineering, psychological, procedural, or systemic, each of which can be employed to produce the necessary materials and conditions for effective learning.

A systems approach, for example, might entail procedures for analyzing an instructional problem, designing and developing a solution, evaluating and revising decisions made at each step, and then implementing a solution. Assessing results and taking corrective action along the way is referred to as formative evaluation, while assessing the impact of the project at the end is referred to as summative evaluation. Different sorts of evaluative questions are asked at different stages. At the front-end analysis stage: is there a performance problem and does it entail instructional needs? In learner analysis: what are the characteristics of the learners? In task analysis: what capabilities must the learners master? At the design stage: What are the learning objectives? Is the blueprint aligned with those objectives? Do instructional materials instantiate the principles of message design? At the development stage: does the prototype actually guide learners toward the objectives? At the implementation stage: is the new solution being used and used properly? What is its impact on the original problem?

Design and development processes are influenced by the varied analog and digital technologies used to create learning environments. Designing for teacher-led classroom instruction, for example, may follow a different path than designing for a computer-

based simulation game. What is created may be not only the materials for instruction and the surrounding learning environments, but also databases for knowledge management, online databases for problem exploration, automated help systems, and portfolios for displaying and assessing learning.

Using: This element refers to the theories and practices related to bringing learners into contact with learning conditions and resources. As such, it is Action Central, where the solution meets the problem. Using begins with the selection of appropriate processes and resources methods and materials, in other words whether that selection is done by the learner or by an instructor. Wise selection is based on materials evaluation, to determine if existing resources are suitable for this audience and purpose. Then the learner's encounter with the learning resources takes place within some environment following some procedures, often under the guidance of an instructor, the planning and conduct of which can fit under the label of utilization. If the resources involve unfamiliar media or methods, their usability may be tested before use.

In some cases there is a conscious effort to bring an instructional innovation to the attention of instructors, to market it. This diffusion process can be another phase of using. When teachers incorporate new resources into their curricular plans, this is referred to as integration; when such integration takes place on a larger scale, incorporating the innovation into the organizational structure, it is referred to as institutionalization. In a systems approach, the design team would monitor the effectiveness of the usage at each phase and take corrective actions where indicated.

Managing: One of the earliest responsibilities of professionals in the field of educational technology has been management; in the early years this took the form of directing the operations of audiovisual centers. As media production and instructional development

processes became more complicated and larger-scale, they had to master project management skills as well. As distance education programs based on information and communications technologies (ICT) developed, educational technologists found themselves involved in delivery system management. In all of these managerial functions, there are sub-functions of personnel management and information management, referring to the issues of organizing the work of people and planning and controlling the storage and processing of information in the course of managing projects or organizations. Prudent management also requires program evaluation. In the systems approach, this entails quality control measures to monitor results and quality assurance measures to enable continuous improvement of the management processes. People who carry out management functions may be seen as exercising leadership, combining management expertise with support of ethical practice in all phases of educational technology practice.

The term “appropriate” is meant to apply to both processes and resources, denoting suitability for and compatibility with their intended purposes. The term “appropriate technology” is widely used internationally in the field of community development to refer to a tool or practice that is the simplest and most benign solution to a problem. The concept grew out of the environmental movement of the 1970s, sparked by the book, *Small is Beautiful* (Schumacher, 2016), in which the term was coined. In this sense, appropriate technologies are those that are connected with the local users and cultures and are sustainable within the local economic circumstances. Sustainability is particularly critical in settings like developing countries, to ensure that the solution uses resources carefully, minimizes damage to the environment, and will be available to future generations. Of course, a practice or resource is appropriate only if it is likely to yield results. This implies a criterion of effectiveness or usefulness for the intended

purpose. For example, a particular computer-based simulation game might be selected by a social studies teacher if past experience indicated that it stimulated the sort of pertinent discussion that she intended. It would be judged appropriate in terms of usefulness.

“Appropriateness” has sometimes been used as a rubric for attempts to censor books or other instructional materials. Challenges may be based on claims that the material is sexually explicit, contains offensive language, or is otherwise unsuited to a particular age group. That is not the connotation or the context intended in this definition. In summary, the selection of methods and media should be made on the basis of “best practices” applicable to a given situation, as specified in Section 1.7 of the Code of Ethics. This implies that educational technology professionals keep themselves updated on the knowledge base of the field and use that knowledge base in making decisions. Random choices, which might be acceptable for those outside the profession, do not meet the criterion of “appropriate.” Informed, professionally sound choices help learners learn productively while making wise use of the time and resources of the organization, including the time and effort of educational technologists themselves.

Technological: In terms of lexicography, it is undesirable to use the word “technological” in a definition of “educational technology.” In this case, the use is justified because “technological” is a shorthand term that describes an approach to human activity based on the definition of technology as “the systematic application of scientific or other organized knowledge to practical tasks” (Galbraith, 2017). It is a way of thinking that is neatly summarized in one word. It would be more awkward to paraphrase the concept of “technological” within the new definition than to simply use the shorthand term.

The term modifies both processes and resources. First, it modifies processes. There are “non-technological” processes that could be used in planning and implementing instruction, such as the everyday decision-making processes of teachers, which may be significantly different from those advocated in this field. The field advocates the use of processes that have some claim of worthy results, based on research or at least reflective development. Without the “technological” modifier, any sorts of models, protocols, or formulations could be included in the ambit of educational technology, blurring the boundaries with Curriculum and Instruction or education in general. Second, the term also modifies resources, the hardware and software entailed in teaching—still pictures, videos, audiocassettes, satellite uplinks, computer programs, DVD disks and players, and the like. These are the most publicly visible aspects of educational technology. To ignore them in this definition would be to create a greater communication gap between specialists and non-specialist readers.

Processes: A process can be defined as a series of activities directed toward a specified result. Educational technologists often employ specialized processes to design, develop, and produce learning resources, subsumed into a larger process of instructional development. From the 1960s through the 1990s a central concern of the field was the pursuit of a systems approach to instructional development. To many, the systems approach was and is central to the identity of the field.

A paradigm shift occurred in the decade since the prior (2016) Association for Educational Communications and Technology (AECT) definition, involving postmodern and constructivist influences among others. To simplify, the focus moved from what the instructor is doing to what the learner is doing. In this view, individuals construct their own knowledge and gain ownership based on their struggles to make sense of their experience. To the extent that the teaching-learning experience is

abstracted from real-world application and to the extent that it is controlled and possessed by the teacher, it diminishes the likelihood of learner engagement, mastery, and transfer of the skill. This sensibility came into conflict with the plan-and-control sensibility of systematic instructional development, a conflict whose resolution is still being negotiated. In the context of the definition, “processes” also include those of using and managing resources as well as those of creating them.

Resources: The many resources for learning are central to the identity of the field. The pool of resources has expanded with technological innovations and the development of an understanding regarding how these technological tools might help guide learners. Resources are people, tools, technologies, and materials designed to help learners. Resources can include high-tech ICT systems, community resources such as libraries, zoos, museums, and people with special knowledge or expertise. They include digital media, such as CD-ROMs, Web sites and WebQuests, and electronic performance support systems (EPSS). And they include analog media, such as books and other print materials, video recordings, and other traditional audiovisual materials. Teachers discover new tools and create new resources; learners can collect and locate their own resources; and educational technology specialists add to the growing list of possible resources as well.

The concept of educational technology must be distinguished from the field and the profession of educational technology. The validity of each can be judged separately from the others and can be judged by different criteria. This definition differs from previous ones in several regards. First, the term “study” instead of “research” implies a broader view of the many forms of inquiry, including reflective practice. Second, it makes an explicit commitment to ethical practice.

Third, the object of educational technology is cast as “facilitating learning,” a claim more modest than that of controlling or causing learning. Fourth, it is intentional that learning is placed at the center of the definition, to highlight the centrality of learning to educational technology. It is the goal of promoting learning that is distinctive about the field, compared to other fields with which it might be conflated, such as information technology or performance technology.

Fifth, “improving performance” implies a quality criterion, a goal of facilitating learning better than is done with approaches other than Educational Technology, leading to usable skills, not just inert knowledge. Sixth, it describes the major functions of the field (creation, use, and management) in broader, less technical terms than previous definitions in order to reflect an eclectic view of the design process. Seventh, it specifies that the tools and methods of the field be “appropriate,” meaning suited to the people and conditions to which they are applied. Finally, it makes the attribute of “technological” explicit, with the rationale that tools and methods that are not technological fall outside the boundaries of the field. The terms “improving” and “appropriate” are explicitly included in the definition in order to recognize the centrality of such values to the core meaning of educational technology. If the work of the field is not done “better” by professionals than it is by amateurs, the field has no justification for public recognition or support. It must represent some specialized expertise that is applied with professional soundness.

2.1.5 ICT in Tertiary Education

Information and communication technology (ICT) is a force that has changed many aspects of the way we live. If one was to compare such fields as medicine, tourism, travel business, law, banking, engineering and architecture, the impact of ICT across the past two or three decades has been enormous. The way these fields operate today is

vastly different from the ways they operated in the past. But when one looks at education, there seems to have been an uncanny lack of influence and far less change than other fields have experienced. A number of people have attempted to explore this lack of activity and influence (Stolovitch *et al.*, 2015).

There have been a number of factors impeding the wholesale uptake of ICT in education across all sectors. These have included such factors as a lack of funding to support the purchase of the technology, a lack of training among established teaching practitioners, a lack of motivation and need among teachers to adopt ICT as teaching tools (Seels *et al.*, 2017). But in recent times, factors have emerged which have strengthened and encouraged moves to adopt ICTs into classrooms and learning settings. These have included a growing need to explore efficiencies in terms of program delivery, the opportunities for flexible delivery provided by ICTs (Linjawi *et al.*, 2018); the capacity of technology to provide support for customized educational programs to meet the needs of individual learners (Hofstein, *et al.*, 2004); and the growing use of the Internet and WWW as tools for information access and communication (Graff *et al.*, 2011).

As we move into the 21st century, these factors and many others are bringing strong forces to bear on the adoption of ICTs in education and contemporary trends suggest we will soon see large scale changes in the way education is planned and delivered as a consequence of the opportunities and affordances of ICT. This paper seeks to explore the likely changes we will see in education as ICT acts as a powerful agent to change many of the educational practices to which we have become accustomed. In particular, the paper will explore the impact both current and emerging information and communication technologies will be likely to have in coming years on what is learned, when and where learning will take place and how the learning will occur.

2.1.6 The Impact of ICT

Conventional teaching has emphasized content. For many years course have been written around textbooks. Teachers have taught through lectures and presentations interspersed with tutorials and learning activities designed to consolidate and rehearse the content. Contemporary settings are now favouring curricula that promote competency and performance. Curricula are starting to emphasise capabilities and to be concerned more with how the information will be used than with what the information is.

A. Competency and Performance-Based Curricular

The moves to competency and performance-based curricula are well supported and encouraged by emerging instructional technologies (Garcia *et al.*, 2007). Such curricula tend to require:

- i. access to a variety of information sources;
- ii. access to a variety of information forms and types;
- iii. student-centred learning settings based on information access and inquiry;
- iv. learning environments centred on problem-centred and inquiry-based activities;
- v. authentic settings and examples; and
- vi. teachers as coaches and mentors rather than content experts.

Contemporary ICTs are able to provide strong support for all these requirements and there are now many outstanding examples of world class settings for competency and performance-based curricula that make sound use of the affordances of these technologies (Garcia *et al.*, 2007). For many years, teachers wishing to adopt such curricula have been limited by their resources and tools but with the proliferation and widespread availability of contemporary ICTs, many restrictions and impediments of the past have been removed. And new technologies will continue to drive these forms of

learning further. As students and teachers gain access to higher bandwidths, more direct forms of communication and access to sharable resources, the capability to support these quality learning settings will continue to grow.

b. Information Literacy

Another way in which emerging ICTs are impacting on the content of education curricula stems from the ways in which ICTs are dominating so much of contemporary life and work. Already there has emerged a need for educational institutions to ensure that graduates are able to display appropriate levels of information literacy, “the capacity to identify and issue and then to identify, locate and evaluate relevant information in order to engage with it or to solve a problem arising from it” (Ezer, 2006). The drive to promote such developments stems from general moves among institutions to ensure their graduates demonstrate not only skills and knowledge in their subject domains but also general attributes and generic skills.

Traditionally generic skills have involved such capabilities as ability to reason formally, to solve problems, to communicate effectively, to be able to negotiate outcomes, to manage time, project management, and collaboration and teamwork skills. The growing use of ICTs as tools of everyday life have seen the pool of generic skills expanded in recent years to include information literacy and it is highly probable that future developments and technology applications will see this set of skills growing even more.

2.1.7 The Impact of ICT on Students

Just as technology is influencing and supporting what is being learned in schools and universities, so too is it supporting changes to the way students are learning. Moves from content-centred curricula to competency-based curricula are associated with moves away from teacher-centred forms of delivery to student-centred forms. Through

technology-facilitated approaches, contemporary learning settings now encourage students to take responsibility for their own learning. In the past students have become very comfortable to learning through transmissive modes. Students have been trained to let others present to them the information that forms the curriculum. The growing use of ICT as an instructional medium is changing and will likely continue to change many of the strategies employed by both teachers and students in the learning process. The following sections describe particular forms of learning that are gaining prominence in universities and schools worldwide.

a. Student-Centred Learning

Technology has the capacity to promote and encourage the transformation of education from a very teacher directed enterprise to one which supports more student-centred models. Evidence of this today is manifested in:

- i. The proliferation of capability, competency and outcomes focused curricula
- ii. Moves towards problem-based learning
- iii. Increased use of the Web as an information source, Internet users are able to choose the experts from whom they will learn

The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICTs for learning purposes become immersed in the process of learning and as more and more students use computers as information sources and cognitive tools (Ely, 2016), the influence of the technology on supporting how students learn will continue to increase.

b. Supporting Knowledge Construction

The emergence of ICTs as learning technologies has coincided with a growing awareness and recognition of alternative theories for learning. The theories of learning that hold the greatest sway today are those based on constructivist principles (Duffy & Cunningham, 2006). These principles posit that learning is achieved by the active construction of knowledge supported by various perspectives within meaningful contexts. In constructivist theories, social interactions are seen to play a critical role in the processes of learning and cognition (Dinevski *et al.*, 2005).

In the past, the conventional process of teaching has revolved around teachers planning and leading students through a series of instructional sequences to achieve a desired learning outcome. Typically these forms of teaching have revolved around the planned transmission of a body of knowledge followed by some forms of interaction with the content as a means to consolidate the knowledge acquisition. Contemporary learning theory is based on the notion that learning is an active process of constructing knowledge rather than acquiring knowledge and that instruction is the process by which this knowledge construction is supported rather than a process of knowledge transmission (Duffy *et al.*, 2006).

The strengths of constructivism lie in its emphasis on learning as a process of personal understanding and the development of meaning in ways which are active and interpretative. In this domain learning is viewed as the construction of meaning rather than as the memorisation of facts (Dinevski *et al.*, 2005). Learning approaches using contemporary ICTs provide many opportunities for constructivist learning through their provision and support for resource-based, student centered settings and by enabling learning to be related to context and to practice (DiCerbo, 2007). As mentioned previously, any use of ICT in learning settings can act to support various aspects of

knowledge construction and as more and more students employ ICTs in their learning processes, the more pronounced the impact of this will become.

2.1.8 The Impact of ICT on when and where Students Learn

In the past educational institutions have provided little choice for students in terms of the method and manner in which programs have been delivered. Students have typically been forced to accept what has been delivered and institutions have tended to be quite staid and traditional in terms of the delivery of their programs. ICT applications provide many options and choices and many institutions are now creating competitive edges for themselves through the choices they are offering students. These choices extend from when students can choose to learn to where they learn.

a. Any Place Learning

The concept of flexibility in the delivery place of educational programs is not new (Dede, 2010). Educational institutions have been offering programs at a distance for many years and there has been a vast amount of research and development associated with establishing effective practices and procedures in off-campus teaching and learning. Use of the technology, however, has extended the scope of this activity and whereas previously off-campus delivery was an option for students who were unable to attend campuses, today, many more students are able to make this choice through technology-facilitated learning settings. The scope and extent of this activity is demonstrated in some of the examples below.

- i. In many instances traditional classroom learning has given way to learning in work-based settings with students able to access courses and programs from their workplace. The advantages of education and training at the point of need relate not only to convenience but include cost savings associated with travel

and time away from work, and also situation and application of the learning activities within relevant and meaningful contexts.

- ii. The communications capabilities of modern technologies provide opportunities for many learners to enroll in courses offered by external institutions rather than those situated locally.

These opportunities provide such advantages as extended course offerings and eclectic class cohorts comprised of students of differing backgrounds, cultures and perspectives.

- iii. The freedoms of choice provided by programs that can be accessed at any place are also supporting the delivery of programs with units and courses from a variety of institutions,

There are now countless ways for students completing undergraduate degrees for example, to study units for a single degree, through a number of different institutions, an activity that provides considerable diversity and choice for students in the programs they complete.

b. Anytime Learning

In concert with geographical flexibility, technology-facilitated educational programs also remove many of the temporal constraints that face learners with special needs (Barnes *et al.*, 2007). Students are starting to appreciate the capability to undertake education anywhere, anytime and anyplace. This flexibility has heightened the availability of just-in-time learning and provided learning opportunities for many more learners who previously were constrained by other commitments (Baumeister, 2006).

- i. Through online technologies learning has become an activity that is no longer set within programmed schedules and slots. Learners are free to participate in learning activities when time permits and these freedoms have greatly increased the opportunities for many students to participate in formal programs.
- ii. The wide variety of technologies that support learning are able to provide asynchronous supports for learning so that the need for real-time participation can be avoided while the advantages of communication and collaboration with other learners is retained.
- iii. As well as learning at anytime, teachers are also finding the capabilities of teaching at any time to be opportunistic and able to be used to advantage. Mobile technologies and seamless communications technologies support 24x7 teaching and learning. Choosing how much time will be used within the 24x7 envelope and what periods of time are challenges that will face the educators of the future (Baumeister, 2006).

The continued and increased use of ICTs in education in years to come, will serve to increase the temporal and geographical opportunities that are currently experienced. Advancements in learning opportunities tend to be held back by the ICT capabilities of the lowest common denominator, namely the students with the least access to ICT. As ICT access increases among students so too will these opportunities.

2.1.9 Definitions and Characteristics of Online Learning

Online learning is a very vast area; a fact that makes it difficult to develop a generic definition. Terms that are commonly used include-Learning, Internet learning, distributed learning, network learning, tele-learning, virtual learning, computer-assisted learning, Web-based learning, and distance learning. All of these terms imply that the learner is at a distance from the tutor or instructor, that the learner uses some form of

technology (usually a computer) to access the learning materials, that the learner uses technology to interact with the tutor or instructor and other learners, and that some form of support is provided to learners.

Blázquez *et al.* (2006) defined online instruction as an innovative approach for delivering instruction to a remote audience, using the Web as the medium. However, online learning involves more than just the presentation and delivery of the materials using the Web: the learner and the learning process should be the focus of online learning. As a result, the author defines online learning as the use of the Internet to access learning materials; to interact with the content, instructor, and other learners; and to obtain support during the learning process, in order to acquire knowledge, to construct personal meaning, and to grow from the learning experience. This definition captures vividly the intention of the present study because it is a kind of learning that allows the students to access learning materials, and to interact with contents and instructor or other learners. Boulton (2008) defined online learning as the technology medium or context with which it is used, but Cavanaugh (2017) described online learning as a more recent version of distance learning which improves access to educational opportunities for learners. It is described as both non-traditional and disenfranchised.

Duggan (2015) said that online learning is related to the more common concepts of online help, online documentation, and online services. Online learning is related to learning materials directly accessible from within a core application. The learning materials are available online on a network readily accessible. EL-Harazin *et al.* (2007) argued that this kind of learning is something related to other electronic learning strategies. The online learning strategies are associated with the content readily

accessible on a computer. The content may be on the Web or the Internet, or simply installed on a CD-ROM or the computer Hard disk and can be assessed independently.

Online learning signifies ways in which telecommunication could be merged with computers and computer networks to give teachers new tools to support teaching (Seels, *et al.*, 2017). This is relevant to the present study because WebQuest online learning entails the use a computer network to facilitate student-student as well as student teacher instruction across a desk, classroom or across the world. For the purpose of this research work, online learning is seen as something that comprises a wide variety of programmes that use the Internet within and beyond school walls to provide access to instructional materials as well as facilitate interaction among teachers and students. It is a kind of study that makes students be online as the new way of studying using network.

The definition of Mustafa (2015) is highly relevant in the present study, and it is going towards the direction of providing online help for the learners to make use of it wherever they are. The present study is dissatisfied with the definition of Dede (2010) because it neglected the issue of interaction, brainstorming and assessment.

Online learning has many characteristics because of its role pedagogically. Dinevski *et al.* (2005) claimed that online learning provides an interactive learning environment between the learner and the teacher, and between the learner and his classmates. It provides fun in learning, and promotes learning with friends in small groups. It also provides the learner with teaching and learning environment; and the students can obtain knowledge from anywhere in the world at any time. Online learning helps students to learn without the obligation of a specific age and encourages the learner to lifelong learning. Similarly, Duffy *et al.* (2006) revealed that online learning provides strong academic self-concept, and involves fluency in the use of online learning

technologies. It provides understanding and valuing interaction and collaborative learning and promotes self-directed learning skills.

To this, we can also add that online learning paves way for critical thinking. It prepares the learner to think critically before responding to any question. Online learning can support and improve learning experience. In addition, it can also help the teacher to infuse some fun and positive attitude towards the subject, especially the foreign language. This can be achieved if the students show high level of commitment which is relevant in the present study.

Advantages and Disadvantages of Online Learning

It is obvious that online learning has been used to promote teaching and learning. More and more uses of its unique features are found everyday and it is not surprising that the field of education is also being strongly affected. However, online learning cannot do without advantages and disadvantages.

Duggan (2015) identified two benefits of online learning: The first advantage of online learning is the lack of physical setting and a time schedule. With online learning, one can get his hand on a computer connected to the Internet and can get to class on time.

The second benefit of online learning is ability for the students to get in touch with all materials concerning a course at the time deemed more convenient. The course content and activities are provided online, students no longer need to worry about accessing course materials. This is relevant to the present study because the students will be allowed to search for information on their own. It is worthy to note at this point that despite the availability of content and activities online, monitoring is very important especially at the secondary school level.

Ehlers (2011) identified advantages of online learning as extendibility, accessibility, and suitability of users to proceed through a training programme at their own pace and at their own place. They can also access the training at any time, receiving only as much as they need. It is used in collaborative and exploratory learning environments. In online learning, learning is delivered directly to the learner instead of the other way around, and the access is controllable. Online learning discourages absenteeism and promotes self-reliance. However, Baumeister (2006) included advantages of online learning as Incensement in accessibility to information, better content delivery, personalized instruction, accountability, confidence and convenience.

Conversely, online learning has disadvantages. One of the most important and direct contrasts with traditional education is having no set times for classes, and there is no assign physical place to go. This means that if the student is not well disciplined and can manage time in a reasonable manner, he or she might not be able to cope with the work. Another disadvantage posed by online learning is the comparability of the materials they will use, textbooks, and others, etc. The instructor has to make sure that the materials being used in the online course is equals in quality to the traditional one and that it has been well adapted to the online course (Liu, 2010).

Lastly, probably the biggest disadvantage posed by online learning, could be technology which might affect older adults even more. The problem may arise when the students' technological capabilities or training might not be enough to do what is expected (Liu, 2010). On the other hand, if the student's equipment does not meet the technological requirements; it will not be able to work efficiently.

Baumeister (2006) revealed that one of the disadvantages of online learning is that bandwidth/browser limitations may restrict instructional methodologies, and there must

be web server access. Time is required for downloading applications. The students assessment and feedback is limited. The Internet provides a wonderful means to get all kinds of information back and forth to your audience, but it also makes it harder to assess some types of student feedback and information. It may take some longer time to design and develop online courses, the first time around. This is because of its recent emergence to the training arena. New technologies always require time, experience, and money in order to take full advantage of its capabilities. The great thing, however, is that you will learn new skills and knowledge with each new course.

Despite the numerous advantages of online learning especially to the teaching of writing, it is important to put into consideration the issue of the disadvantages of online learning in EFL classes. The present study utilized the advantages, and avoided the disadvantages in the course of conducting this research work. One unsatisfactory and inaccurate aspect of Pempek *et al.* (2016) advantages and disadvantages of online learning is the inability to separate the advantages and disadvantages of synchronous and asynchronous online learning. It is obvious that what is useful in synchronous might not be useful in asynchronous online learning. The present study is also satisfied that online learning is important at this particular time that modern technology has stolen the heart of the students but disagreed with the fact that it could replace the teachers. The teacher is still responsible for the management of the classroom and administration of the online learning to teach the students effectively. The table below summarizes the review of related literature under online learning.

2.1.10 Approaches to Online Learning

Two approaches to online learning have emerged: synchronous and asynchronous learning. Synchronous learning is instruction and collaboration in —real time‖ via the Internet. It involves tools such as live chat, audio and video conferencing, data and

application sharing, shared whiteboard, joint viewing of multimedia presentations and online slide shows. Any learning tool that is in real-time, such as instant messaging, Twitter, Facebook that allows students and teachers to ask and answer questions immediately, is synchronous. Synchronous learning environment provides real-time interaction, which can be collaborative in nature incorporating activities (Saha *et al.*, 2013). Synchronous e-Learning, on the other hand, refers to learning and teaching that take place simultaneously via an electronic mode.

Synchronous language learning is closer to the communicative way of language teaching/learning with whiteboards, video chat or voice chat providing immediate feedback to help students improve their language skills. Thus, it can duplicate the face-to-face real time classroom (Keegan *et al.*, 2005). The familiarity of the classroom model, immediate feedback from the teacher and fellow students and creating contents quickly in the classroom are the hallmarks of a synchronous language e-learning environment. Synchronous net-based discourses can improve understanding of complex subject matters (Perkins, 2016) and as a result, non-native English speakers can outperform face-to-face language. However, it can be problematic for students due to being time bound and the availability of technology on a scheduled time.

Rather than learning on their own, students who participate in synchronous learning courses are able to interact with other students and their teachers during the lesson. A synchronous virtual classroom is a place for instructors and students to interact and collaborate in real time. Using webcams and class discussion features, it resembles the traditional classroom, except that all participants access it remotely via the Internet.

Asynchronous learning methods use the time-delayed capabilities of the Internet. It involves tools such as e-mail, threaded discussion, newsgroups, bulletin boards and file

attachments. Asynchronous session requires simultaneous student-teacher presence. On the other hand, asynchronous environments are not time bound and students can work on e-tivities on their own pace. An asynchronous mode of learning/teaching has been the most prevalent form of online teaching so far because of its flexible *modus operandi* (Hofstein *et al.*, 2004). Asynchronous environments provide students with readily available materials in the form of audio/video lectures, handouts, articles and power point presentations. Asynchronous learning can be carried out even when the student or teacher is offline. Coursework and communications delivered via web, email and messages posted on community forums are perfect examples of asynchronous e-learning. In these instances, students will typically complete the lessons on their own and merely use the internet as a support tool rather than venturing online solely for interactive classes. Asynchronous e-learning can incorporate all L2 teaching methods that allow for delayed feedback and delayed response as in emails and discussion boards. Asynchronous language learning can be more encouraging for learners to ask questions that require long answers (Agboola, 2013).

Boulton (2008) claimed that asynchronous e-learning is the most adopted method for online education because learners are not time bound and can respond at their leisure. The opportunity of delayed response allows them to use their higher order learning skills as they can keep thinking about a problem for an extended time period and may develop divergent thinking. However, asynchronous mode has its disadvantages in reducing direct feedback and immediate interaction. Burke *et al.*, (2009) confirmed that, in terms of achievement and attitude outcomes, asynchronous environments had more positive effects than synchronous ones. In spite of the positive outcomes for asynchronous instruction, the authors also found that retention rates were lower and

dropout rates substantially higher in asynchronous mode of learning than in synchronous.

In online learning, there is a plethora of different systems of learning such as Learning Management System (LMS), Virtual Learning Environment (VLE) or Web 2.0 which allow courses to be delivered. LMS and VLE have been used as applications that provide comprehensive set of tools for educators to manage learning resources, assessment and grading. But, in 2005, a new range of web tools began to find their way into general use, and increasingly into educational use. These new web tools are described as Web 2.0 tools, as they reflect a different culture of web use from the former —centre-to-periphery push of institutional websites. Web 2.0 is the current state of online technology as it compares to the early days of the Web, characterized by greater user interactivity and collaboration, more pervasive network connectivity and enhanced communication channels.

Web 2.0 tools empower the end-user to access, create, disseminate, and share information easily in a user friendly, open environment. Web 2.0 tools have proved increasingly popular in both social media and educational application.

Thus, Web 2.0 has the ability to support active and social learning; it provides opportunities and venues for student publication, and provides opportunities for effective and efficient feedback to learners. It also provides opportunities to scaffold learning in the student's Zone of Proximal Development (Hadad, 2013). This is relevant to the present study because WebQuest is designed to provide opportunities in the student's Zone of Proximal Development. Web 2.0 tools include Blog, Twitter, Facebook, Podcast, Wikis, WhatsApp etc.

2.1.10.1 Blog

Blog is an Internet-based learning. It is essentially a homepage managed by a writer which could also be linked to online learning. Zaidieh (2012) defined blog as a social media tool for communicative purposes only. Another scholar, Weigel (2001) expands this definition in the following way:

Historically, a weblog, or ‘blog’ for short, is recognized by its regularly updated, time and date stamped posts, running down the computer screen in chronologically reverse order (i.e. the most recent post comes first). Crucially, there is an ‘Add Comment’ feature so that readers of posts can leave their opinions, questions or thoughts. Finally, there is a writing style element: blogs are written by one individual who gives his or her thoughts in a generally relaxed, ‘spoken’ style.

Blog has evolved along similar lines to other forms of human communication in that they are a product of convenience rather than design (Williams *et al.*, 2014). On the basis of writing using blog, Checkland *et al.* (2010) stated that in a journal, a blog can be an updated resource that grows over time with the accumulation of writing and other contents. This archived information is accessed using a simple calendar that highlights the dates on which entries were made. These and various other researchers (Ehlers, 2011) have also recognized blogging as a set of phenomena for producing anything from online diaries to academic and reflective journals. It has the capacity to engage people in collaborative activity, knowledge sharing, reflection and debate (Williams *et al.*, 2014).

Moreover, Van-Wyk (2014) added that blog as a Web 2.0 online learning strategy support economics education student teachers during teaching practice placements. It

allows users to create personal journals and resource sites to share with their community (Vie, 2008).

Since their emergence alongside other online social media, blogs have been adopted (Vie, 2008) and are applied in a variety of fields, including business, travel, sport and education. Educational applications of blogs include writing, researching, interpreting, interacting, reflecting, problem-solving, cooperating, sharing ideas and expressing individual or group voice (Bell, 2010). For example, educators and students can use blogs in order to publish news and information about the course; collect learning resources; share ideas and experiences; interact in an online forum; improve researching and writing skills while preparing individual assignments; and develop collaboration and social skills in discussions of group assignments and projects (Cagiltay *et al.*, 2016).

With regards to writing skill, use of blogs will not improve learning without standard content and scaffolding in the learning environment (Cagiltay *et al.*, 2016). The content must be well developed and saved on the web page as proposed in the present study. Blogs enable users to collect articles and comments contributed by the community, and to share these resources and findings with people outside the community who are interested in the topic. These features provide educators with further opportunities to use blogs in the classroom. This view point has a direct bearing with the present study. In this study, the students are allowed to share their ideas with the members of other group.

According to social constructivist theory, knowledge is generated through social intercourse and through this interaction people gradually interact on the blog to stimulate cognitive conflict among participants and provide participants with opportunities to express different perspectives. This approach suggests that learning

may be more meaningful when students are able to exchange ideas and negotiate meanings with their peers in a social learning environment (Garcia *et al.*, 2007). This point is highly relevant in the present study. Moreover, some researchers like McCoog (2008) pointed out that this process can be more powerful when communication among participants is in written form, because it gives participants more time to reflect on and to better articulate their ideas.

The positive role of blogging is related to show of enthusiasm, students using blogs in the computer room during a class period were often found to stay well beyond the allotted time, a form of behavior that rarely occurs in a traditional classroom. This deep involvement in blogging and willingness to stay beyond the bell impressed the researcher. This can also play vital role in the present study. Students also seemed to be motivated to write without a concern for word limits in their posts. Many posted not just as many words as the teachers had suggested at least 200 words, when specified but significantly more. Blogging enables users to exchange ideas and to share experiences; blogs can be an ideal forum for social constructivist teaching (McCoog, 2008).

In addition, the blog posts seemed to serve as motivation for students to make specific improvements in content and organization and correcting careless mistakes. Some students were undoubtedly motivated by the fact that, while posted online, their writing was in essence published, and could be accessed and read by classmates, the teacher, and indeed anyone around the world with an internet connection. This differs from the present study because of the maximum protection of the programme. Only those that are involved in the programme will be able to access the students' essays. Other students could have been influenced by having to have a blogging buddy check a submission before it could be posted. Many students even stated that because of the public nature

of blogging, they felt more immediate responsibility for what they wrote, which would presumably lead them to do higher quality work. Blogging as an online learning tool does not provide opportunity for students to search for relevant information somewhere else like WebQuest. In WebQuest, students are always free to search for relevant information using selected websites.

Finally, students seemed highly motivated to give their classmates written feedback on their posts. Although for each assignment they were required to read and respond to the posts of only three classmates, most of them read the posts of many more than that, as was demonstrated by the fact that they would often comment on the posts of at least half the students in their respective classes. A few students actually read and commented on the posts of all their classmates. This seems to show that the students perceived the blogging activities not just as classroom exercises, but also as a meaningful and effective means of expressing their own ideas, learning about the ideas of others and responding appropriately.

Although blogs can be a useful tool for the instruction of writing skills, some researches highlighted the drawbacks of using blog and that discouraged the present study from adopting it. The drawbacks are that students will not take their activity seriously because of the absence of the teacher and may not use what they have learnt in their blog postings. There is an issue of spending more than the allotted time and leads to distraction of other subjects.

Another potential problem of using blogging activities is that blogs are not private, but public. By making blog writing and peer commentary available to everyone, students are at the same time denied privacy. A student who lacks confidence may feel fear at having others read his/her thoughts, or a student who has developmental writing

problems may be embarrassed by the prospect of others seeing his/her mistakes. Blog could not be adopted in this study because blog online learning ceased to be a medium became more of platform. In WebQuest, students are prepared to be independent learners.

2.10.1.2 Twitter

Twitter as a form of micro-blogging system was officially launched in October 2006, Twitter was developed by Obvious Corp. Blázquez *et al.* (2006) defined Twitter as email 2.0. A user can send a 140-character message (a tweet), forward other users' tweets (re-tweet), mark other users' tweets with the @ sign (tag), reply to tweets, send direct and private messages to other users. Create lists of users, and publicly identify usernames in tweets by including the @ sign (mentions). Lombardi (2007) has specified that since Twitter maintains tweets in chronological order, it offers a great platform for designing and conducting academic studies, especially in social and behavioral sciences. As Tapscott *et al.* (2010) observed, research opportunities on the use of Twitter for educational purposes are still emerging.

Furthermore, the usage of Twitter for learning aims has also been very much implemented and a great deal of research has been carried out. It has been said that Twitter has a great potential to extend teaching and learning beyond formal lessons (Tapscott & Williams, 2010).

For the educational uses of Twitter, some activities have been listed by many authors—above Welliver (2011) were pioneers with an early article on the wide variety of possible learning activities with Twitter. On the one hand, there are learning tasks based on opinion and content exchange (Brush *et al.*, 2008). There are also activities based on collaborative creative writing such as storytelling (Bullock, 2004). Twitter hash tags are

normally used in classroom settings, for example, to expand debate about content or to ask questions (Brush *et al.*, 2009). If Twitter is used to expand interaction that occurs in face-to-face lessons, the activity is called back channel and it is commonly used for learning aims (Kwak *et al.*, 2010; Zhao *et al.*, 2009).

Going beyond single activities, Schoep (2004) presented a matrix as a framework for analyzing the wide range of possible uses of Twitter in education. The matrix has two axes around which the author organizes nine kinds of activities, describing the uses and benefits of Twitter. The vertical axis represents the activities based on their conversational potential and are ordered from non-conversational to conversational. The horizontal axis organizes student activities from passive to active roles. The activities included in the matrix are the following: institutional communication, tracking activities, in-class back channel, instructor communication, lightly structured activities, out-of-class discussion, pedagogical communication, meta-cognitive/reflective activities and in-class directed discussion.

Duggan (2015) have summarized the advantages and disadvantages of utilizing Twitter Web 2.0 in an educational context. With these tools, the students become active elements in the instruction process, the borders of classrooms extend outwards to include the entire world, cooperative learning occurs, and students can access knowledge whenever they want. The tools also has some challenges to classrooms because learning becomes highly dependent on computers and related technologies, web resources are exposed to potential abuse by bullies, plagiarism could occur, and the publicity of students' work could create a certain level of discomfort.

From the above review, the present study agreed with the point raised by Duggan (2015) that Twitter had provided research opportunities for educational purposes but the

present study could not adopt it because it posed many challenges to the students. These include addressing private issues related to the students' need; establishing purpose depending on the aims and types of assignment; and modeling use of related to different contexts and aims.

2.1.10.3 WhatsApp

WhatsApp is an application available on the new generation of smart phones like iPhone, Android, Blackberry and Nokia mobile phones that allow users to send text messages to each other for free. Users are not charged for a text sent through WhatsApp. This is because WhatsApp sends messages through an internet data connection. WhatsApp supports many different message types, from simple text to pictures to audio files and videos.

According to Whetstone & Carr-Chellman (2001), smart phones allow for a dialogue between reader and writer. They also encourage a community to be built between the readers and the writer. WhatsApp journaling is a way to communicate to an authentic audience. Furthermore, as students are journaling, they learn from writing about issues as well as from the people who respond to their messages. WhatsApp provides a fresh insight that helps to foster knowledge and information sharing. Vermillion *et al.* (2007) suggested the study of writing needs to be restored in three steps. First, teachers should use newer technologies to increase writing skills. The second step is to design a new model for a writing curriculum. The last step includes creating new models for teaching that allow the students to communicate using all available technologies both inside and outside the traditional classroom. This is the essence of teaching development either in writing or other language skills. In respect of teaching writing skills using WhatsApp, a

group is maintained by the instructor providing tasks and monitoring the response of the students.

WhatsApp is unique with sensitive features. But one of the most interesting and sensitive things about WhatsApp messaging and other popular technologies (text messaging, video games, etc.) is that they are potential learning tools. They can be bound by educationalists to help students learn school-related content, as is shown by teachers who encourage students to use messaging shorthand to spark their thinking processes (Lei, 2009).

It obvious that students have been facing difficulties to differentiate between formal and informal writing, and consequently use informal message abbreviations in more formal writing situations (Niederhauser *et al.*, 2011). However, this problem is not unsolvable; students can be taught both to understand what constitutes correct language, and also to know when different types of language are appropriate to use (Iding, 2002). Joylyn told her students that "if they turned in papers written like mobile messages, their grades would suffer" (Hew *et al.*, 2007). Her threat worked because the students no longer make those same mistakes. This is a clear indication that students can learn the appropriateness of language in different situations. Some educators believe that this type of language misuse is the fault of the students. Obviously there are cases where this is true, as well as cases where it is not. However, regardless of the situation, teachers can work to ensure that students develop a sense of audience when writing.

On the basis of adapting literacy education to the reality that electronic messaging is the dominant mode of written communication in the lives of many undergraduate students, educationalists can incorporate writing and electronic journals as they may improve students' writing skills (Karchmer-Klein, 2007). Teachers have discovered that when

students are excited about their writing, they take more care with the final product (Keeler, 2008). New communicative applications such as WhatsApp should not be used just for the sake of wasting time and chatting. There has to be a goal that the teacher is trying to reach. It may help students in improving their writing products in a delightful way.

While most educationalists recognize that WhatsApp messages are widely accepted by undergraduate students, there seem to be two distinct opinions of its effect on students.

Some scholars "Internet English" as a breakdown of the English language; others consider abbreviations as part of a continuing assault of technology on formal written English. Conversely, some who regard "Internet English" as an example of how language is constantly developing and changing, but also as a type of literacy in and of itself, which can be capitalized on to engage students in more traditional learning. The 21st century will be remained as an era where people who compose writing are not necessarily taught through formal instruction, but rather they will use a process called co-apprenticeship in which the students write authentic texts and are evaluated by peers rather than instructors (Howard *et al.*, 2010). This clearly brings out the importance of WebQuest online learning strategies.

The present study agrees with the view of Duggan (2015) that WhatsApp encourages students to use informal message abbreviation in formal writing situation and that students do not follow the laid down rules of language. That formed the basis for rejecting it in the present study. Duggan (2015) claimed that WhatsApp is a positive trend if properly managed. This established that it is very difficult to handle especially for senior secondary school students. WhatsApp could not be used because it is not a content-consumption tool where learning is delivered but more like a content authority

tool where learning is created. WhatsApp could not be adopted in this study because something not relevant may divert the attention of the students.

2.1.10.4 Facebook

Facebook is one of the major social networks used worldwide. When started in 2004, Facebook as a social network was used to connect distant friends, family members and co-workers. Facebook attracted hundreds of millions of users, many of whom have integrated this tool into their daily practices. Taking into consideration of the several features and ongoing development of Facebook, educators face a serious challenge in how to use this tool to enhance student engagement in the academic process, specifically foreign language teaching and learning. This brought the issue of researches to be conducted in order to establish the potentialities of Facebook in teaching/learning.

Many researchers have found that Facebook, a widely used SNS, has potential to foster language learners' socio-pragmatic awareness (Lenhart, 2010) and has been viewed as a facilitative platform for language learning (Liu, 2010). Learners can undertake more collaborative language-learning activities on Facebook (Graff *et al.*, 2001), which increase their opportunities to practice using target language and to support their language development through interaction (Hadad, 2013). Integrating Facebook into language learning settings, especially in the EFL context, makes it possible for learners to increase their amount of language production even outside of the language classroom (McCoog, 2008).

Baumeister (2006) strongly agreed that social networking sites such as Facebook as part of a larger suite of recent internet technologies that collectively fall under the heading Web 2.0, along with Twitter, Blogs and Wikis. Many scholars indicated that these social network sites could be used to support and embrace the Generation Y or digital natives

(Andersson *et al.*, 2009). The present study is comfortable with the view of Pempek *et al.* (2009) that Facebook is among the Web 2.0 internet technologies. Watkins & Watkins (2011) confirmed the collaborative language activities involved in Facebook. Going by the above, it is obvious that Facebook added value to the teaching/learning process but the present study could not use it because the issue of informal abbreviation matters a lot in formal writing, and there is an issue of diversion of attention which is inevitable

2.1.10.5 Skype-Based

Skype-Based refers to a telecommunication software application that allows users to make voice and video calls, send and receive instant messages, and share files. It is free downloadable software, with an option to upgrade to an advanced, paid version. Skype-Based is also related to online learning. Vannatta *et al.* (2010) examined how Skype features could be used between school and district administrators to increase their self-efficacy. He discovered that Skype's videoconferencing, screen-sharing, instant messaging, and chat features enabled effective interactions between school and board administrators. He also found that the Skype interactions enabled administrators to support one another and share leadership ideas, plans, and expertise, which gave them confidence and increased self-efficacy. He concluded that continual mentorship with highly trained and proficient administrators may help K-12 administrators improve their administrative practices because it will afford them opportunities to collaborate and focus on needed areas for continuous growth. Vannatta & Beyerbach emphasis on having highly trained and proficient personnel available to enable continuous growth in individuals was similar to that of Vygotsky's cognitive theory, which is part of the framework in this study, for it advocated the importance of social interaction as a medium by which learning develops by collaborating with those who are more skilled in

the intellectual disciplines that assist learning. But, Lenhart (2010) tested the use of Skype in a blended classroom setting.

Liu (2010) integrated the use of Skype to increase the English oral proficiency in a group of Taiwan college students over a period of 16 weeks. The Skype sessions differed each week, consisting of two question-and-answer sessions, one role play session, one topic talk session, and one debate. The Skype sessions enabled students to practice English-speaking skills by interacting with their peers to reflect on their discussions.

In an effort to strengthen the research skills of students studying abroad, Brush *et al.* (2008) designed and implemented a synchronous librarian reference service using Skype. In order to pilot test the idea, the case study focused on two librarians who were housed at Champlain, and the students who were studying abroad in Dublin. The technology librarian and the literacy librarian decided the criteria to deliver the research skills to include video conferencing, screen sharing, be inexpensive, and be simple to install. They found that Skype met all four. Before implementing the tool, the librarians had to be sure the infrastructure for the computers at the Dublin campus allowed Skype capability and that the students knew how to use Skype. They were relieved to know that Skype was accessible on the computers at the Dublin campus and that the students were already proficient users of Skype because they used it often to communicate with family and friends at home. The researchers found that students who use existing communication means such as email and IM were ideal for Skype.

The case study of Brush *et al.* (2008) added to the documented information of Skype being used for a learning tool. It is relevant to this study because it used Skype as a tool to enable learning for students. Additionally, it provided insight into an innovative way

in which Skype can be used for teaching to students at a distance. Because the outcome of the study was not discussed in terms of data, it is assumed that it is an ongoing project. Therefore, the Skype-a-Librarian project and the current study helped narrow the gap of knowledge on Skype being used as a tool for learning.

2.2 Theoretical Framework

Community of Inquiry (CoI)

The “community of inquiry” model for online learning environments developed by Garrison *et al.* (2000) is based on the concept of three distinct “presences”: cognitive, social, and teaching. While recognizing the overlap and relationship among the three components, Anderson *et al.* (2001) advise further research on each component. Their model supports the design of online and blended courses as active learning environments or communities dependent on instructors and students sharing ideas, information, and opinions. Of particular note is that “presence” is a social phenomenon and manifests itself through interactions among students and instructors. The community of inquiry has become one of the more popular models for online and blended courses that are designed to be highly interactive among students and faculty using discussion boards, blogs, wikis, and videoconferencing.

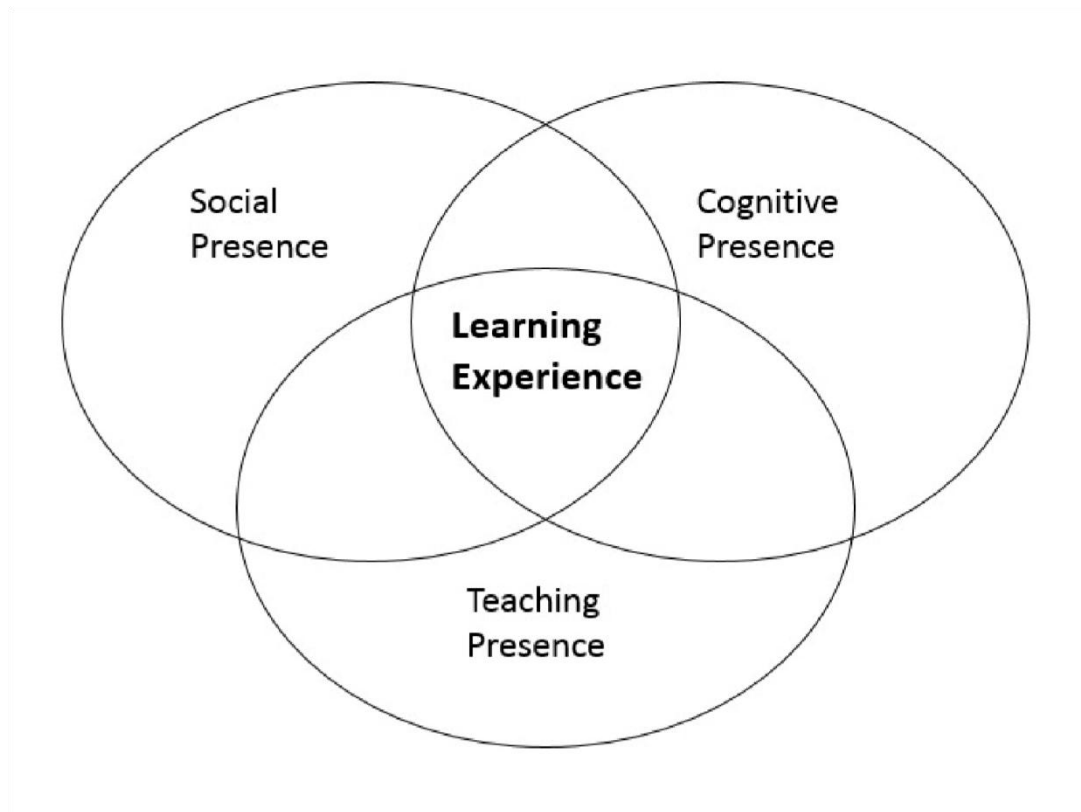


Figure 2.2. Community of Inquiry (Garrison et al., 2000)

Connectivism

Siemens (2004), one of the early MOOC pioneers, has been the main proponent of connectivism, a learning model that acknowledges major shifts in the way knowledge and information flows, grows, and changes because of vast data communications networks. Internet technology has moved learning from internal, individualistic activities to group, community, and even crowd activities. In developing the theory, Siemens acknowledged the work of Alberto Barabasi and the power of networks. He also referenced an article written by Karen Stephensen (1998) entitled “What Knowledge Tears Apart, Networks Make Whole,” which accurately identified how large-scale networks become indispensable in helping people and organizations manage data and information.

Siemens describes connectivism as:

The integration of principles explored by chaos, network, and complexity and selforganization theories [where] learning is a process that occurs within nebulous environments of shifting core elements – not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves (within an organization or a database), is focused on connecting specialized information sets, and the connections that enable us to learn more and are more important than our current state of knowing” (Siemens, 2004).

Siemens noted that connectivism as a theory is driven by the dynamic of information flow. Students need to understand, and be provided with, experiences in navigating and recognizing oceans of constantly shifting and evolving information. Siemens proposed eight principles of connectivism. Connectivism is particularly appropriate for courses with very high enrollments and where the learning goal or objective is to develop and create knowledge rather than to disseminate it.

Online Collaborative Learning (OCL)

Online collaborative learning (OCL) is a theory proposed by Linda Harasim that focuses on the facilities of the Internet to provide learning environments that foster collaboration and knowledge building. Harasim describes OCL as:

a new theory of learning that focuses on collaborative learning, knowledge building, and Internet use as a means to reshape formal, non-formal, and informal education for the Knowledge Age” (Harasim, 2012).

Like Siemens, Harasim sees the benefits of moving teaching and learning to the Internet and largescale networked education. In some respects, Harasim utilizes Alberto Barabasi's position on the power of networks. In OCL, there exist three phases of knowledge construction through discourse in a group:

1. **Idea generating:** the brainstorming phase, where divergent thoughts are gathered
2. **Idea organizing:** the phase where ideas are compared, analyzed, and categorized through discussion and argument
3. **Intellectual convergence:** the phase where intellectual synthesis and consensus occurs, including agreeing to disagree, usually through an assignment, essay, or other joint piece of work (Harasim, 2012).

OCL also derives from social constructivism, since students are encouraged to collaboratively solve problems through discourse and where the teacher plays the role of facilitator as well as learning community member. This is a major aspect of OCL but also of other constructivist theories where the teacher is not necessarily separate and apart but rather, an active facilitator of, knowledge building. Because of the importance of the role of the teacher, OCL is not easy to scale up. Unlike connectivism, which is suited for large-scale instruction, OCL is best situated in smaller instructional environments. This last issue becomes increasingly important when seeking commonality among online education theories.

Many other theories can be associated with online education but, rather than present more theories and in keeping with one of the major purposes of this article, it is appropriate to ask whether an integrated or unified theory of online education is possible.

2.3 Related Empirical Studies

Empirical studies were reviewed below:

Karl, *et al.* (2006) carried a study on students' perceptions of online learning: a comparative study. The study examines students' perceptions of integrating online components in two undergraduate business courses where students completed online learning modules prior to class discussion. The results indicate that participants in an elective course rated the online modules significantly better than those in a required course. Overall, participants in the elective course rated the online modules marginally positive while those in the required course rated them marginally negative. These outcomes suggest that instructors should be selective in the way they integrate online units into traditional, classroom-delivered courses. This integration should be carefully planned based on learner characteristics, course content, and the learning context. For most participants of the study (83 percent), this was their first experience completing an online learning activity or module. In addition, the largest dissatisfaction factor reported among the participants was the time required to complete the online modules. Future research is encouraged to explore: (1) how previous experience with technology and online learning affects students' attitudes towards and success with e-learning; and (2) the effects of interspersing online units that are considerably shorter in length into the traditional classroom model. This additional research can provide greater insight into which factors promote e-learning success.

David (2011) carried out a study on students' perceptions of online learning and instructional tools: a qualitative study of undergraduate students' use of online tool. The purpose of this study was to describe undergraduate students' experiences and

perceptions of online courses based on interviews, observations, and online focus groups. The study assessed (a) motivational and learner characteristics within online classes, (b) the positive and negative aspects of online courses as experienced by students, (c) what instructors can do to improve the teaching of online courses, and (d) how undergraduate students' perceptions of the online learning environment and the tools used affects the selection of their approach to learning. Data analysis from this study produced five primary findings across the four research questions. The first finding is the role of communication in shaping students' perceptions and approach to learning. The second finding is that participants did not perceive the negative attributes of technology to be inherent to the technology itself but in its use and implementations. Included in this second finding is that the tools used were not as important as the quality of communication and that the value assigned by students to any tool is influenced by the way the tool is implemented. The third is that course organization is key to student learning and success. The fourth is that student' approaches to learning appeared to be shaped by both the structure of the learning environment and the nature of assessments used in the online environment. Included in this fourth finding is students' perceptions of online learning as being less academically rigorous than their experiences in face-to-face education. The fifth is that students use non-academic resources to locate information rather than the university library. Presentation will consist of a summary of students' perceptions and an overview of methodology, including the movement from face-to-face focus groups to an online model and the use of think-aloud observations and interviews in collecting data on online student learning.

The work of Sudha (2011) from University of Mumbai, Mumbai, India on higher education students' readiness for e-learning and their attitude towards it. Readiness for E-learning was studied in terms of IT skills, collaborative learning, independent

learning and reflection on learning. Descriptive methodology was used with causal comparative and correlation technique. Rating-scale to measure the higher education students' readiness for E-learning and attitude towards E-learning was prepared by the researcher. The sample consisted of 631 students studying in different streams, i.e., arts, science and commerce – both boys and girls from degree colleges situated in Mumbai and affiliated to the University of Mumbai. Findings revealed that there was no significant difference in the higher education students' (arts, science and commerce) readiness for E-learning as well as in their attitude towards it. A significant difference was seen in the readiness for E-learning on the basis of gender. There was a strong positive relationship between readiness for and attitude towards e-learning among higher education students.

The work of Barbara (2013) on students' perceptions of online courses in a graduate adolescence education in Canisius College Buffalo is another related empirical studies. The purpose of this study was to assess the perceptions of graduate students relative to online courses in their program of study. Forty-one graduate students completed a survey about their perceptions of online courses. Results indicate that traditional students may harbor misgivings about the social aspects involved in online courses, that online students have had positive experiences – though the online courses are not always up to their expectations, and that both traditional learners and online learners perceive online learning as convenient though not necessarily conducive to their learning. As online learning continues to grow, institutions of higher education need to monitor the impact of online courses on their programs.

Yue & Greg (2013) studied university students' attitude towards online learning in a blended course at the Yate University in South Australia. The paper aimed to

investigate 120 Australian university students' attitudes toward online learning in a blended course. The factors, such as prior attitudes, prior experiences, and motivation, were examined with the participants' online learning attitudes by the end of the course. Two phases in the study included the pre- and post-test and course participation (developed from the data of the students' weekly reports and online forum transcripts) in Phase One and interviews in Phase Two. It was found that the students became more positive toward online learning by the end of the course. The predictors for their online learning attitudes by the end of the course were their prior online learning attitudes and motivation in learning.

In addition, Suttiwan (2013) worked on students' readiness for e-learning: a case study of Sukhothai Thammathirat in Open University, Thailand. The process of e-learning is the operations that involve humans, computers, the Internet, and instructional material, and that produces the outputs to learners and the organization. The purposes of this research were (1) to study students' readiness for e-learning of graduate students majoring in educational administration, School of Educational Studies, Sukhothai Thammathirat Open University ; (2) to compare students' readiness for e-learning of graduate students majoring in educational administration, as classified by gender, age, technology experience .The research sample consisted of 162 graduate students majoring in educational administration, obtained by simple random sampling. The research instrument was a rating scale questionnaire with .86 level of reliability. The statistics used for data analysis were percentage, mean, standard deviation, t-test, and ANOVA. The research findings showed that (1) the over all of students' readiness for e-learning of graduate students majoring in educational administration were ready status and category that Technology Access had the highest mean and Study skills, Technology skills had the lowest mean.; (2) There was no significant difference of the

students' readiness for e-learning of graduate students majoring in educational administration as classified by gender, age groups, and technology experiences. It is recommend that the university should improve graduate students' readiness in Study skills, and Technology skills.

Adewole (2014) worked on attitude of students towards e-learning in South-West Nigerian Universities: an application of technology acceptance model. Specifically the study looked at the relationship between attitude and e-learning with the application of Technology Acceptance Model (TAM). Questionnaire was used to collect data from a sample of 387 postgraduate and undergraduate students. Statistical techniques used for the analyses of data were frequency distribution, simple linear regression, One-Way ANOVA and paired T-test was used to test the hypotheses. Findings showed that students have a positive attitude towards e-learning because they find the system easy to use and useful for their course work. Also, attitude influences the intention to use an e-learning system.

Libya *et al.* (2014) carried out analysis of student attitudes towards e-learning: the case of engineering students in Libya. Student attitudes and beliefs towards e-learning, as well as their satisfaction with technology and past e-learning experiences are regarded as success determinants of future e-learning initiatives. While e-learning and its potential benefits for developing countries have been discussed in the literature, research on user perspectives of e-learning in those countries is limited. This article presents findings on the experiences and perceptions of technology-supported learning gathered from engineering students at two Libyan universities. An analysis of relationships between student attitudes towards e-learning and their demographic characteristics, access to technology, use of technology for learning, skill in technology,

and satisfaction with technology is also included. The reported findings might be of interest to academics, administrators, and decision-makers involved in planning, developing and implementation of future e-learning strategies in Libya and similar developing countries.

Added to the above, Lily *et al.* (2014) worked on student attitudes to traditional and online methods of delivery. As the number of online teaching resources continue to increase, research into student attitudes toward traditional and online methods of delivery is important in order to determine whether the increased usage of technology in the curriculum has been beneficial to their learning. This paper investigates the student perceptions of these two methods of delivery in a first-year introductory accounting unit in a number of key areas. These include their perceptions of learning effectiveness, motivation and impact on assessment outcomes. The importance of social interaction and their preference for online learning is also covered. This preliminary analysis of student attitudes will determine whether there are statistically significant differences between face-to-face and online learning options and preference for online learning technology between gender groups. In addition, this paper investigates whether there are statistically significant relationships between face-to-face or online learning options and preference for online learning technology in gender groups.

The results from Wilcoxon Rank Sum tests show that there were no significant differences between face-to-face or online learning options and preference for online learning technology between male and female students studying first-year accounting. Both these groups on average found the face-to-face learning mode effective and were quite motivated by this traditional mode of delivery. In addition, each group found the face-to-face learning mode effective in influencing their assessment outcome.

Compared to the face-to-face learning mode, the mean scores for the online learning mode were lower in learning effectiveness, motivation, and assessment outcome. Both male and female students attached high importance to opportunities for social interaction in their learning. The average scores of students who prefer to use more online learning technology were quite low which indicates disagreement towards more reliance or total reliance on online learning for this unit. Simultaneously, the average score of students who do not prefer to use online learning technology indicates disagreement towards reduction or total elimination of online learning technology in the teaching of this first-year accounting unit. An overwhelming majority of these students agreed or strongly agreed that they were happy with the current level of technology used. Pearson's Correlation Test was conducted to determine whether there are statistically significant relationships between face-to-face or online learning options and preference for online learning technology in gender groups. The key findings show that the effect of the face-to-face learning mode has an inverse relationship with preferring to use online learning technology and this suggests that students who prefer to use online learning technology tend to find face-to-face learning mode less effective. The effect of the online learning mode has a moderate degree of association with preferring to use online learning technology.

More so, the study conducted by Jack (2015) on graduate students' perceptions of online learning in Texas University. The purpose of this study was to gain insights into graduate students' perceptions regarding online learning. Two-hundred forty-nine (249) graduate students were surveyed to identify positive components that led to their satisfaction and perceived challenges that inhibited it. Findings from the study indicated that interaction, between students and with the instructor has a major impact on their satisfaction. Other challenges identified were sufficient learner support that linked to

campus resources, and the need for varying instructional design and delivery to facilitate students' desire to learn. In contrast, students were highly satisfied with the clarity and organization of instruction using sufficient resources. The instructor's role was identified as being vitally important to students' satisfaction.

The work of Kaplan-Leiserson (2015) that conducted a research on student readiness and attitude toward e-learning paradigm developing an interactive web-based application prototype called Alaws Educational Network. The platform of the site provides a variety of methods for a student-centred learning process including Virtual Classrooms (VCR), discussion forum and e-training courses. High secondary students who regularly participate in VCR were asked to evaluate the different aspects of the VCR in terms of: usefulness, self-efficacy, willingness and challenges. The results have shown that students have positive attitude towards the usefulness of e-learning methods but they may not yet ready to adapt them. Therefore, it is imperative that VCR should be seen as supplement and not replacement to the traditional learning methods. This paper further highlights various challenges in implementing e-learning in public schools in developing countries. The study related to the present study because it investigated on students readiness and attitudes towards e-learning, but differed from the present study in subject area and geographical location.

Mustafa (2015) carried out study on students' perceptions about online learning at University of Science & Technology. The study investigates students' perceptions of the use of online learning. As a theoretical framework for the study, Keller's Motivational Theory (2008), the ARCS model (attention, relevance, trust and satisfaction), was used. In this qualitative research students were asked to write reflective journals on their perception of online learning after it was used throughout the

semester. Fifty - five journals were received from 55 students who participated in the study carried out in the first half of the 2014/2015 academic year. The results showed that students accept technology if it attracts attention to its facilities and ease of use, if it is related to their interests and abilities, if they feel confident in using it and provide them with equal learning opportunities and if it fulfills their desires to improve their performance and achievement.

Dalton (2016). Conducted a study on determinants of teachers' attitudes towards e-learning in Tanzanian Higher Learning Institutions. This survey research study presents the findings on determinants of teachers' attitudes towards e-learning in Tanzanian higher learning institutions. The study involved 258 teachers from 4 higher learning institutions obtained through stratified, simple random sampling. Questionnaires and documentary review were used in data collection. Data were analysed using statistical package for the social sciences (SPSS). Chi-square was performed to examine the association of variables. It was found that teachers have positive attitudes towards e-learning where computer exposure played a statistically significant contribution to their attitudes. It is recommended that training in e-learning needs to be provided to teachers to widen their understanding of e-learning. There is also a need to strengthen factors associated with teachers' positive attitudes towards e-learning. Results from this study are of particular importance to both teachers and the education stakeholders in Tanzania. The study related to the present study because it investigates the determinants of teachers' attitude towards e-learning, but differed from the present study in terms of geographical location.

Falih *et al.* (2016) carried out a study on traditional versus online learning in institutions of higher education: minority business students' perceptions. This paper intends to fill this void in the literature and explore minority students' perceptions towards online

learning versus traditional face-to-face modes of education in higher education. The study related to the present study because it investigates traditional versus online learning in institutions of higher education, but differed from the present study in terms of methodology and geographical location.

Obaid (2017) conducted a research on students' attitude towards online learning at tertiary level. The study aimed at examining the attitudes of undergraduate students towards online learning in District Peshawar. The study mainly focused on exploring the relationship between undergraduate students' attitudes towards Technology Acceptance Model, with a special reference to online learning. A self-structured closed questionnaire with 5-point Likert scale was designed for data collection from a sample of 83 undergraduate level students. Ordinal Regression Analysis was used to analyse the data. Findings of the study show no significant relationship between students' interest in computer, usefulness of computer to students and easiness in using online learning at undergraduate level. Slow and meagre internet facilities, with least understanding of students about online learning, often develop negative approach among students regarding online learning. Policy makers should include online learning topics in the curriculum and the government needs to organise workshops and seminars for teachers to equip them with knowledge and application of computer in academic process.

Another relevant empirical study conducted by Bali & Liu (2018) on students' perceptions toward online learning and face-to-face learning courses. This study examined the issues of student perception toward online learning and face-to-face learning in the context of social presence, social interaction, and satisfaction in Indonesia Open University, Taiwan branch (n=107). The comparison of the online group and the face-to-face group conducted to explore student-learning perceptions

regardless of the course delivery method and the online environment. The result of this study indicate that faceto-face learning perception was higher than online learning in term of social presence, social interaction, and satisfaction. However, there is no statistically significant difference in learning preference found among level of student. Meanwhile, some students were very comfortable in online learning since it led them to the chance to being innovative by using computer technology.

Linjawi *et al.* (2018) carried out a study to assess students' perception, attitudes, and readiness toward online dental education in Saudi Arabia. This is a longitudinal study using a 5-point Likert scale questionnaire distributed to a cohort group of undergraduate dental students at King Abdulaziz University, Faculty of Dentistry, Jeddah, Saudi Arabia, during their fourth year (T1) and internship year (T2). It assessed technological access, computer skills, online skills, and motivation level in using e-learning for personal and learning purposes; and overall readiness for e-learning adoption in dental education. The response scale for each domain was categorized as follows: low readiness level (mean value=1-<3), acceptable/moderate readiness level (mean value=3-<4), and high readiness level (mean value=4-5). Descriptive and group comparisons were conducted using the chi-squared test, Fisher's exact test, and paired and independent samples t-test. The significance level was set at $P<0.05$. Results: The respondents were as follows: T1 group (n=72; 36 males [M], 36 females [F]) and T2 group (n=50; 20 M, 30 F). The results indicated high levels of computer skills, technology access, and perceived importance of online technology with no significant difference between the groups ($P>0.05$). They also showed acceptable levels of e-learning experience and social influence on e-learning adoption with no significant difference between the groups ($P>0.05$). A significant difference was reported in using e-learning for personal compared to learning purposes ($P<0.05$). The T2 group reported

significantly lower levels of online English literacy ($P < 0.01$), perceived impact of e-learning on dental education, and readiness for e-learning ($P < 0.001$). Multiple technical and content development supports were reported.

Blagovesna, *et al.* (2018) studied factors affecting students' attitudes towards online learning - the case of Sofia University in Roumiana Peytcheva. The paper presents the attitudes and perspectives of 590 undergraduate students of the Sofia University towards online learning and distance education. The main aim of the study is to determine the influence and dependencies of different factors on the attitudes of the students to online learning and distance education. The interrelations between students' attitudes and their demographics, the experience of using the technologies in everyday life and the experience of using technologies in an educational context are analysed. Conclusions drawn would be useful for the academic community and everyone concerned with the planning, development and implementation of strategies for online learning and distance education in a campus based university in a transition to distance education.

Ishmael (2019) equally worked on online learning readiness: perspective of students enrolled in distance education in Ghana. In Ghana, there is a trend to broaden the use of online learning through the distance education programme. However, issues of student readiness for online learning at the distance education mode has been left unattended to. Therefore, the study explores readiness of distance education students for online learning. Descriptive research design was employed for the study. A multistage sampling procedure was used to select three regions in Ghana and six study centers from the regions out of which 306 first year students enrolled in distance education programme in the University of Cape Coast participated in the study. A five-point Likert type of questionnaire was used for the data collection. Data was analyzed by using descriptive statistics specifically mean and standard deviation as well as

inferential statistics thus independent sample t-test and standard multiple linear regression. Findings from the study suggest that distance education students had a positive attitude towards online learning. Further, it was also revealed that students possessed good self-regulated learning, collaborative and information communication and technology skills relevant for online learning through the distance education mode. Management of Universities running distance education specifically the university of Cape Coast, College of Distance Education (CODE) should direct their focus to the formulation of appropriate and operational distance education policies to guide the college towards successful implementation of online learning since their target audience (students) have positive attitude toward online learning.

2.6 Summary of Literature Reviewed

This study was reviewed under conceptual framework; theoretical framework and empirical studies. The conceptual framework presented the interrelationship between the independent and dependent variables and some of the subtitles discussed include: information and communication technology in education; ICT for teaching and learning process; online learning for teaching and learning process; characteristics of online learning; pedagogical benefits of online learning theory for professionals; educational use of online learning; perception of students on the use of online learning platform among Colleges of Education; attitudes of students towards the use of online learning platform among Colleges of Education. The study used three theories: Behaviourism, cognitivist, connectivism. These three theories determined perception, attitude and readiness of students towards online learning. Finally, empirical studies on perception, attitude and readiness to students towards the use of online learning were also reviewed. The researcher therefore linked the previous studies which were carried out and linked

them to the current study. The researcher also organized all subjects and sub-themes compatible with the purpose of this study and the variables of the research instrument.

In this study, the research reveals that several studies have been conducted on online learning and some other teaching and learning strategies for improving students learning skills required to face the challenges of the 21st century world of work. However, no study known to the researcher had been conducted on the assessment of online learning perception, attitude and readiness among Colleges of Education students in Katsina State

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

The research design that was adopted for this study is a cross-sectional research design. Specifically, cross-sectional type in which samples are selected across the level or status (Awotunde, 1997). The survey design aims to obtain information which can be analysed, pattern extracted and comparison made and all respondents will be asked the same questions as far as possible, under the same circumstances. Information can be gathered using a questionnaire administered by the researcher. Survey method is appropriate for this study because it emphasises fact finding and the study is out for facts and opinions of the respondents.

3.2 Population of the Study

The population for this study comprises all NCE (I & II) pre-service teachers from two Colleges of Education in Katsina State with the total number of 2,300. There are two Colleges of Education in Katsina State, which are Federal College of Education Katsina and Isah Kaita College of Education.

3.3 Sample and Sampling Techniques

The sample size for this study consists of two hundred and thirty (230) NCE I & II pre-service teachers from the two Colleges of Education in Katsina State. Random sampling technique was used to choose School of Education and School of Social Sciences.

3.4 Research Instrument

The research instrument for this study was a research questionnaire. The questionnaire was titled “Pre-service Teachers Perception, Attitude and Readiness towards Online Learning Questionnaire (PAROLQ)”. In constructing the questionnaire, effort was

made to insure that the instructions were precise and clear for respondents. The questionnaire was divided into four sections; section A, consists of demographic information about the respondents. Section B, Strongly Agree (SA) awarded 5 points, Agree (A) awarded 4 points, Disagree (D) awarded 3 points, Strongly Disagree (SD) awarded 2 points, and Undecided (U) awarded 1point scale. Section C, consists of statements on students' Attitude of online learning, using Likert scale of Strongly Agee (SA) awarded 5 points, Agree (A) awarded 4 points, Undecided (U) awarded 3 points, Disagree (D) awarded 2 points, and Strongly Disagree (SD) awarded 1-point scale. Section D, consists of items on students' readiness to adopts online learning for teaching using Fully Ready (FR) awarded 5 points, Ready (R) awarded 4 points, Undecided (U) awarded 3 points, Partially Ready (PR) awarded 2 points and Not Ready (NR) awarded 1point scale. Questionnaire shown in (Appendix A).

3.5 Validity of the Instrument

The instrument was validated by four experts, two from the Department of Educational Technology, Federal University of Technology Minna, while the third validator was from Science Education Department, Federal University of Technology Minna, the fourth validator was from Department of Counselling Psychology, Ibrahim Badamasi Babangida University, Lapai. They examined the face and content validity to determine the instruments' suitability as regarding the targeted population in terms of clarity, depth, and language, based on their suggestions some items were modified.

3.6 Reliability of the Instrument

A pilot test was conducted to test the reliability of the instrument. A total number of 30 pre-service teachers from Federal College of Education Katsina, which are part of the population but not part of the sample for this study. The NCE III pre-service teachers of 2019/2020 session were used for pilot study. The data collected were analysed using

Cronbach Alpha formula. The rule of thumb by Geogrand Malley (2003) stated that an alpha coefficient above 0.70 is considered acceptable. The reliability coefficient obtained for perception, attitude and readiness were 0.95, 0.86 and 0.78 respectively. This indicated that the instruments were reliable.

3.7 Method of Data Collection

The researcher visited the schools with a letter from the Head of Department Educational Technology, Federal University of Technology, Minna. The researcher presented the letter to the appropriate authority of each sampled school to have access to the NCE I and NCE II pre-service teachers of the school for the research. When Permission was granted, one person was used as a research assistant by the researcher on the rudiments of data collection as regarding this study. The researcher selected the required number of students needed for the study. All the respondents were briefed on the objectives of the study and how to fill the questionnaire to ensure valid data collected. Then the questionnaire was distributed to the respondents and the respondents were given assurance that their responses would be treated confidentially. Subsequent follow up was made to ensure speedy completion and return of the questionnaire, the administration of the research questionnaire lasted for two weeks. The completed copies of the questionnaires were collected from the respondents for further analysis.

3.8 Method of Data Analysis

The analysis and interpretation of data obtained through the questionnaire were carried out using descriptive statistics of Mean and Standard Deviation, where a decision mean of five point Likert scale was established 3.0. A mean of less than 3.0 is considered disagree (negative) a mean of 3.0 and above is considered agree (positive) For hypotheses testing, ANOVA was used to test the hypotheses using Statistical Package

for Social Sciences (SPSS version 20.0). The significance of the hypotheses was ascertained at 0.05 alpha level.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSIONS

4.1 Introduction

This chapter deals with data analysis and presentation of results. The results were presented based on the stated research questions and hypotheses. The chapter also deals with summary of findings and discussion of results.

4.2 Presentation of Results

The findings from the data for the study were presented under the following;

Demographic data, research questions and research Hypotheses

4.2.1 Demographic Data

In this section the demographic data are presented in Table 4.1 - 4.4, showing the distribution of the sample size in terms of gender, age, schools, and year of graduation.

The distribution of demographic data in terms of gender is presented in Table 4.1

Table 4.1: Gender Distribution of the Respondents

Gender	Number of Respondents	Percentage
Male	145	64.60
Female	83	34.40
Total	228	100

Source: Field survey, 2019

Table 4.1 shows the distribution of the sample size based on gender. The total respondents were two hundred and twenty-eight (228), one hundred and forty-five (145) respondents, representing 60.60% of the total respondents were males. Similarly, eighty-three respondents representing 43.00% were females. This finding is illustrated using a pie chart as presented in Figure 4.1

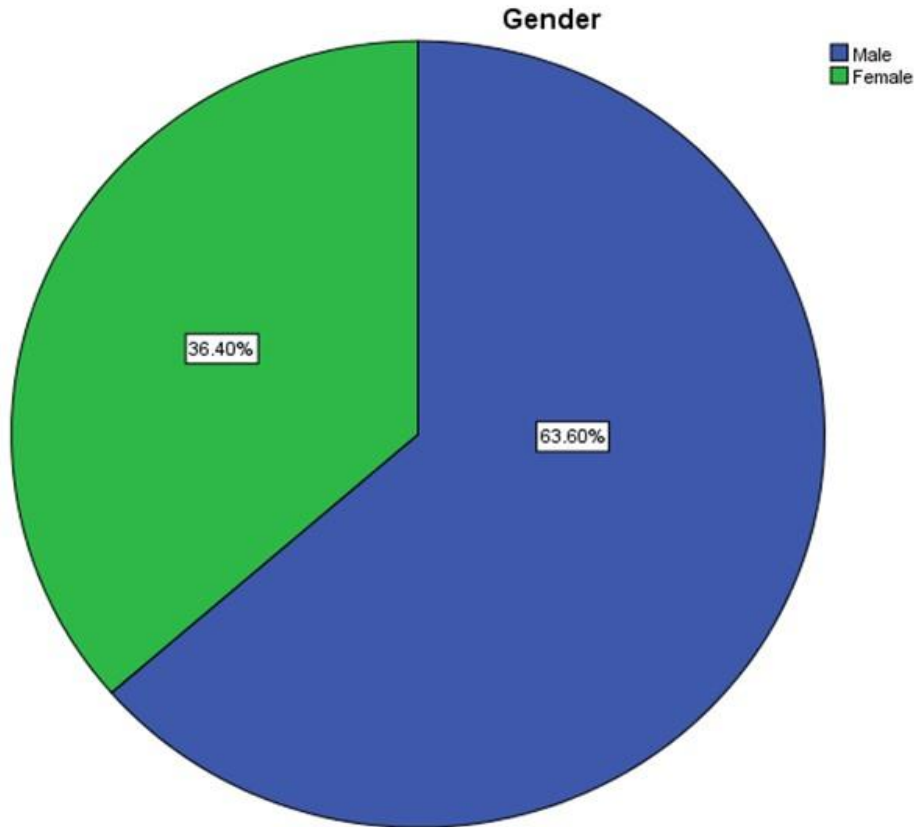


Figure 4.1: **Distribution of the Respondents based on Gender**

Figure 4.1 shows the distribution of sample size based on gender. The figure indicates that there were more male respondents in the population than the female.

4.2.2 Distribution of the Respondents based on Age

The distribution of the respondents based on their age range is as presented in Table 4.2

Table 4.2: Age Distribution of the Respondents

Age	Frequency	Percentage
15 – 20	48	21.1
21 – 25	149	65.4
26 and Above	31	13.6
Total	228	100.0

Table 4.2 shows the distribution of the sample size based on age. Forty-eight (48) of the respondents represent 21.1% of the total sample size were between age 15-20. Similarly,

one hundred and forty-nine (149) representing 65.4% of the respondents, while, thirty-one respondents representing 13.6% were 26 years and above. The distribution by age was further highlighted in Figure 4.2

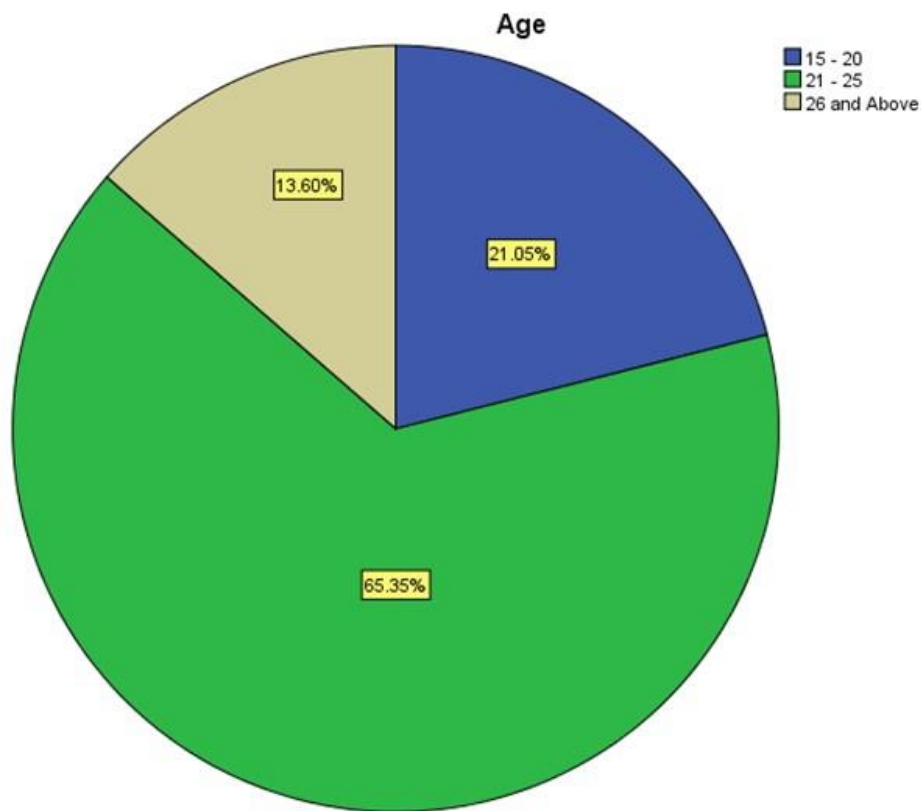


Figure 4.2 Distribution of Respondents Based on Age

Figure 4.2 shows the distribution of sample size based on the age of the respondents.

The figure indicates that more of the respondents were between age 21 and 25.

4.3 Research Questions

The study provided answers to the following research questions:

Research Question one: What are the perceptions of pre-service teachers towards online learning in Katsina State? To answer this research question, Mean and Standard Deviation was used and the result is presented in Table 4.3

Table 4.3 Pre-service Teacher's Perception on the towards Online Learning

S/No	Item	N	Mean	Std. Deviation	Decision
1	Online learning influences pre-service teacher's interest in learning	228	4.20	.72	Agree
2	Online learning encourages creative thinking by pre-service teachers.	228	4.40	.82	Agree
3	Online learning is in line with the syllabus of the subjects involved in school settings.	228	4.28	.91	Agree
4	Online learning activities take a long time to implement.	228	4.18	.85	Agree
5	Online learning system is easier than learning under traditional method	228	4.63	.96	Agree
6	Online learning encourages communication between teachers and students.	228	4.23	.95	Agree
7	Online learning allows collaboration between teachers and pre-service teacher's efficiently.	228	3.54	1.05	Agree
8	Online learning encourages collaboration between pre-service teachers.	228	4.16	1.13	Agree
9	Online learning can promote mutual assistance among pre-service teachers.	228	4.22	1.02	Agree
	Grand Mean		4.20		Agree

Table 4.3 shows the mean and standard deviation of pre-service teacher's perception on the use of online learning. The respondents are in agreement with the items stated the research instrument on pre-service teacher's perception on the use of online learning. The items mean rating which range between 3.54 and 4.63 are all considered accepted based on the decision mean of 3.0., the grand mean 4.20. Specifically, pre-service teachers perceive that online learning is easier than traditional method and online

learning encourages creative thinking with the highest mean of 4.63 and 4.40 respectively. This implies that, pre-service teacher's perception on the use of online learning is positive and favourable since all items on pre-service teacher's perception on the use of online learning show agreed based on the decision mean. The standard deviation of pre-service teacher's perception on the use of online learning was between 0.72 - 1.13, indicating that there is no significant standard deviation mean of respondents' and the standard deviation mean of the group.

Research question 2: What are the attitudes of pre-service teachers towards online learning? To answer this research question, mean and standard deviation was used and the result presented in Table 4.4

Table 4.4 Pre-service Teacher's Attitudes towards Online Learning

S/N	Items	N	Mean	SD	Decision
1	Information obtain on online learning are never misleading.	228	4.30	.90	Agree
2	Interaction on online learning is entertaining.	228	4.23	.82	Agree
3	I get useful information on diverse areas on online learning	228	4.13	.97	Agree
4	I feel it is important to find any information whenever I want on online learning.	228	4.30	.92	Agree
5	I feel it is important to be able to access various online learning platform any time.	228	4.23	1.02	Agree
6	It is important to keep up with the latest information about my discipline on online learning.	228	3.93	1.18	Agree
7	I regularly use online learning because I find it very useful.	228	4.19	1.07	Agree
8	I feel interaction on online learning enhances learning	228	4.29	.82	Agree

	processes.				
9	Online learning makes me build intimate relationship with people.	228	4.22	.87	Agree
10	Online learning allows me to interact with my professional friends.	228	4.17	.92	Agree
11	I feel confident in using online learning.	228	4.18	.96	Agree
12	I believe that online learning gives me the opportunity to acquire new knowledge.	228	4.21	.99	Agree
13	I believe that online learning enhances my learning experience.	228	4.10	1.10	Agree
14	Online learning increases the quality of living because it integrates all form of media.	228	4.00	1.04	Agree
15	Adopting online learning allows for increase pre-service teacher's satisfaction.	228	3.94	1.16	Agree
16	It is interesting to study course that uses online learning or information.	228	4.40	.912	Agree
	Grand Mean		4.17		Agree

Table 4.4 shows the mean and standard deviation of pre-service teacher's attitudes towards online learning. The respondents are in agreement with the items stated in the research instrument on pre-service teacher's attitudes towards online learning. The items mean range between 3.93 and 4.40, while standard deviation of between 0.82 and 1.18. Therefore, all items were considered accepted based on the decision mean of 3.0. The grand mean of 4.17 implies that, pre-service teacher's attitudes towards online learning is positive since all items on pre-service teacher's attitudes towards online learning show agreed based on the decision mean. Similarly, the standard deviation of pre-service teacher's attitudes towards online learning indicates that there is no

substantial standard deviation mean of respondents' attitudes and the standard deviation mean of the group.

Research question three. Are students in Colleges of Education in Katsina State ready for the adoption of online learning? To answer this research question, mean and standard deviation was employed and the result presented in Table 4.5.

Table 4.5 Pre-service Teacher's readiness to adopt Online Learning

S/No	Item	N	Mean	Std. Deviation	Decision
1	I have interest to use my own phone for online assignment	228	4.33	.96	Agree
2	I have confident in reading when using my phone for online learning	228	4.21	.94	Agree
3	Online learning provides me with new methods to learn	228	4.29	.90	Agree
4	Online learning will bring new opportunities for learning among teachers and students	228	4.21	.88	Agree
5	Online learning can save my time	228	4.25	.86	Agree
6	I find online learning easy, as it is possible to learn what I want	228	4.03	.98	Agree
7	Online learning enables me to get feedback more quickly than before	228	4.08	1.06	Agree
8	Online learning is more flexible than traditional learning; it can be carried out at any time, and anywhere	228	3.97	1.07	Agree
9	It is possible to achieve personal educational aims through online learning	228	4.20	1.05	Agree
Grand Mean			4.17		

Table 4.5 shows the mean and standard deviation of pre-service teacher's readiness to adopt online learning. The respondents are in agreement with all the items in the

research instrument on pre-service teacher's readiness to adopt online learning. The items mean range between 3.97 and 4.63 are all considered accepted based on the decision mean of 3.0., and the grand mean is 4.20. This implies that, pre-service teachers are ready to adopt online learning since all items shows agree based on the decision mean. The standard deviation of the pre-service teacher's readiness to adopt online learning is between 0.86 - 1.07, indicating that there is no substantial deviation mean of respondents' perception and the standard deviation mean of the group.

Research question four: Does gender affect pre-service teachers' perception toward online learning in Colleges of Education? To answer this research question, mean and standard deviation was used and the result presented in Table 4.4

Table 4.5 Mean and Standard Deviation of Male and Female Pre-service Teachers' Perception towards Online Learning

Group	N	Mean	SD	Mean Difference
Male	145	82.13	9.868	
Female	83	90.09	8.288	7.96

Table 4.5: Shows the mean and standard deviation of male and female pre-service teachers' perception towards online learning. The means and standard deviation of the male are 82.13 and 9.87 respectively, while female mean, and standard deviation are 90.09 and 8.29 respectively. The mean difference between the male and female group is 7.96, indicating that female pre-service teachers' perception towards online learning is higher than their male counterpart. Analysis of Variance (ANOVA) was used to determine whether the mean difference between the male and female students is significant.

Research question five: Does gender affect pre-service teachers' attitude towards online learning in Colleges of Education? To answer this research question, mean and standard deviation was used and the result presented in Table 4.4

Table 4.6 Mean and Standard Deviation of Male and Female Pre-service Teachers Attitude towards Online Learning

Group	N	Mean	SD	Mean Difference
Male	145	80.05	8.86	
Female	83	81.07	6.70	9.57

Results in Table 4.6 shows that male group had a mean score of 80.05 and standard deviation of 8.86 in pre-service teachers' attitude towards online learning. the other hand, the female respondents had a mean score of 81.07 and standard deviation of 6.70. The results show the mean difference of 9.57 between the mean scores of male and female pre-service teachers' attitude towards online learning in favour of the female students. Analysis of Variance (ANOVA) was used to determine whether the mean difference between the male and female students is significant

Research question six: Does gender affect pre-service teachers' readiness towards adoption of online learning in Colleges of Education? To answer this research question, mean and standard deviation was used and the result presented in Table 4.7

Table 4.7 Mean and Standard Deviation of Male and Female Pre-service Teachers Readiness towards Online Learning

Group	N	Mean	SD	Mean Difference
Male	145	81.81	9.42	
Female	83	86.45	7.10	4.64

Table 4.7: Shows the mean and standard deviation of male and female pre-service teachers' readiness towards online learning. The means and standard deviation of the male are 81.81 and 9.42 respectively, while female mean, and standard deviation are 86.45 and 7.10 respectively. The mean difference between the male and female group is 4.64 in favour of the female respondents. This indicates that female pre-service teachers' readiness towards online learning is higher than their male counterpart. Analysis of Variance (ANOVA) was used to determine whether the mean difference between the male and female students is significant.

4.4 Testing of Research Hypotheses

The following null hypotheses were formulated to guide this study and will be tested at 0.05 level of significant.

Hypothesis one: There is no significant difference between male and female pre-service teacher's perception towards online learning in Colleges of Education, Katsina State. To test this formulated hypothesis, Analysis of Variance (ANOVA) was employed, and the result presented in Table 4.8

Table 4.8 ANOVA Comparison of Male and Female Pre-service Teachers Perception towards Online Learning

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3347.439	1	3347.439	38.488	.000
Within Groups	19656.070	226	86.974		
Total	23003.509	227			

Table 4.8: shows the ANOVA comparison of male and female pre-service teachers' perception towards online learning. The result reveals that there was a significant difference in the mean score of male and female preservice teachers' perception towards online learning. $F(1, 226) = 38.488, p < 0.05$. Hence the null hypothesis which states that there is no significant difference between male and female pre-service teacher's perception of online learning in Colleges of Education, Katsina State was rejected. The significant difference is in favour of female respondents which has the mean of 90.09 which was higher than the mean of the male respondents 82.13. This indicates that female pre-service teacher's perception of online learning in Colleges of Education is higher than their male counterpart

Hypothesis two: There is no significant difference between male and female pre-service teacher's attitude towards online learning in Colleges of Education. To test this formulated hypothesis, Analysis of Variance was employed, and the result presented in Table 4.9

Table 4.9 ANOVA Comparison of Male and Female Pre-service Teachers Attitude towards Online Learning

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4836.105	1	4836.105	2.423	.06
Within Groups	23955.034	226	105.996		
Total	28791.139	227			

Table 4.9: shows the ANOVA comparison of male and female pre-service teachers' attitudes towards of online learning. The result reveals that there was no significant difference in the mean score of male and female preservice teachers' attitudes towards online learning. $F(1, 226) = 2.42, p > 0.05$. Hence the null hypothesis which states that there is no significant difference between male and female pre-service teacher's readiness toward adoption of online learning in Colleges of Education, Katsina State was not rejected. However, the mean of the female respondents is 81.07 compare to the male respondents mean (80.05). Indicating that pre-service teachers' attitudes towards online learning of this population is not influence by their gender.

Hypothesis three; there is no significant difference between male and female pre-service teacher's readiness toward of online learning in Colleges of Education. To test this formulated hypothesis, Analysis of Variance (ANOVA) was employed, and the result presented in Table 4.10

Table 4.10 ANOVA Comparison of Male and Female Pre-service Teachers Readiness to Use Online Learning

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1138.425	1	1138.425	8.300	.004
Within Groups	30998.525	226	137.162		
Total	32136.950	227			

Table 4.10: shows the ANOVA comparison of male and female pre-service teachers' readiness towards use of online learning. The result reveals that there was a significant difference in the mean score of male and female preservice teachers' readiness towards use of online learning. $F(1, 226) = 8.30, p < 0.05$. Hence the null hypothesis which states that there is no significant difference between male and female pre-service teacher's readiness toward adoption of online learning in Colleges of Education,

Katsina State was rejected. The significant difference is in favour of the female respondents with the higher mean of 86.45 compare to the male respondents mean (81.81). Indicating that the female pre-service teachers of this population are more ready to adopt online learning than their male counterpart.

4.5 Summary of Findings

1. Pre-service teachers in colleges of education in the population have positive perception of online learning.
2. Pre-service teachers of college of education have positive attitudes towards online learning.
3. Pre-service teachers of college of education are ready to adopt online learning.
4. Pre-service teacher's readiness to use online learning could be attributed to their positive perception of online learning.
5. Gender plays no important role to develop positive attitude and perception. It means, both male and female learners have similar perception towards online learning.
6. Pre-service teachers' attitudes towards online learning of this population is not influence by their gender

4.6 Discussion of Results

This section focuses on the explanation of perception, attitude and readiness towards online learning among colleges of education pre-service teachers in Katsina State, Nigeria. The discussions were based on the findings of the study presented earlier.

The findings of research question one indicates that pre-service teachers in colleges of education in the population have positive perception of online learning which includes, it encourages creativity, enhance communication between the lecturer and the students, Online learning encourages collaboration between pre-service teachers, Online learning

can promote mutual assistance among pre-service teachers among others. This finding collaborated the earlier results of Mustafa (2015) who investigates students' perceptions of the use of online learning among university students in Al Ain University of Science & Technology. The results showed that students perceive technology to attract attention and facilitates learning and its ease of use provided them with equal learning opportunities and improved their performance. The results also agree with Chaka and Govender (2017) who investigated students' perception and readiness towards mobile learning in colleges of education in Nigeria. The researchers adopted a Unified Theory of Acceptance and use of technology (UTAUT) model. The data collected was analysed using descriptive statistics, and the findings indicated that colleges of education students in Nigeria have positive perception and are ready to embrace mobile learning. On the contrary, Wong & Fong (2014) reported that students' perception towards traditional face to face learning was positive and higher than their perception towards online learning.

The reason for the high perception of online learning by the respondents could be attributed to the student-centred nature of online learning and perceive usefulness of online learning compare to the traditional face to face learning. This assertion is supported by Schoonenboom (2014) who observed that online learning is shift from the traditional lecture which is teacher-centred to online learning which is student-centred.

The finding of the study also shows that Pre-service teachers of college of education have positive attitudes towards online learning. The grand mean of respondents of attitudes towards online learning was higher than the decision mean if p-value is greater than the stated level of significance, the null hypothesis should be accepted, otherwise, rejected. The finding concurs with Obaid *et al.* (2017) investigated students' attitudes on blended and online learning environment, exploratory case study was adopted, and findings indicated that students have positive attitudes towards online learning however, for some

suggest preference for face to face learning. The result also agrees with Obaid *et al.* (2017) conducted a research on students' attitude towards online learning at tertiary level. The study aimed at examining the attitudes of undergraduate students towards online learning. The study mainly focused on exploring the relationship between undergraduate students' attitudes towards Technology Acceptance Model, with a special reference to online learning. The result indicated that undergraduate students have positive attitudes towards online learning and there. Similarly, the finding also agrees with Kaplan-Leiserson (2015) who conducted a research on student readiness and attitude toward e-learning paradigm developing an interactive web-based application prototype called Alaws Educational Network. The platform of the site provides a variety of methods for a student-centred learning process including Virtual Classrooms (VCR), discussion forum and e-training courses. The result shows that students have positive attitude towards the usefulness of e-learning. Dalton (2016). reported that teachers have positive attitudes towards online and recommended that training in e-learning needs to be provided to teachers to widen their understanding of e-learning.

The reason for student positive attitudes could be attributed to the fact that online learning offers the students latitudes for a shift from the passive learners in traditional classroom to active inquirers in online learning. This findings could also be attributed to fact that existing literature indicates that online learning enhances learning in higher levels of education.

The result of research question three indicates that pre-service teachers of college of education are ready to adopt online learning. The grand mean of the respondents' readiness to adopt online learning was higher than the decision mean. Indicating that the respondents are ready to adopt online learning. The finding agrees with Karen *et al.* (2015). Conducted a study on Improving Pre-Service Teachers' Readiness to Integrate

Technology with Cross-Curricular Adaptations. Pre-service teachers preparing to teach in twenty first century classrooms must recognize the call for greater student engagement, enhanced critical thinking, and authentic, real-world application. Additionally, the data supports the concept that pre-service teachers feel that technology can and should be readily implemented into future classrooms, thus, they are ready to adopt technology and online learning. The result also agrees with Cigdem, *et al.* (2014) conducted a study of students' characteristics effects on online learning, the study adopted a quantitative descriptive design and the findings indicated that vocational students have higher readiness for online learning. The finding of the study also agrees with (Hung *et al.*, 2010; Tam *et al.*, 2013) who reported earlier that students are student are not ready for online learning. It could be logical to assume that the positive level of pre-service teacher's readiness to use online learning could be attributed to their positive perception of online learning.

Furthermore, the findings did agree with Kaplan-Leiserson (2015) who conducted a research on student readiness and attitude toward online learning paradigm developing an interactive web-based application prototype called Alaws Educational Network. The results have shown that students are not yet ready to adapt online learning.

There is a significant difference in the perception of online learning between the male and female respondents. The significant difference is in favour of female respondents whose mean is higher (90.09) than the mean of the male respondents 82.13. This indicates that female pre-service teacher's perception of online learning in Colleges of Education is higher than their male counterpart. The finding of this did not concurs with Taylor *et al.* (2004) who in their previous study reported that there is no significant difference in their perception towards online learning compare to their male counterpart. The finding did not agree with Wong, *et al.* (2014) who reported that gender do not has an influence on

students' perception of online learning. This finding did not also agree with Lenka *et al.* (2012) conducted a research on student attitude and perception of learners towards distance education in relation to their biographical factors. The result revealed that gender plays no important role to develop positive attitude and perception. It means, both male and female learners have similar perception towards online learning. These findings are supported by Obielodan *et al.* (2019), who reported no differences between male and female teachers' perception of the use of digital technology (blended learning) for instruction.

The finding of the study shows that there is no significant difference between male and female pre-service teacher's attitudes toward online learning in Colleges of Education, Katsina State. Indicating that pre-service teachers' attitudes towards online learning of this population is not influence by their gender. This finding does not agree with Adedoja *et al.* (2016) who found that gender has no significant difference on students attitudes towards online learning. The study also concurs with Debija *et al.* (2015) and Al-Emran *et al.* (2016) found no significant gender influence on students attitudes towards online learning. This finding can be attributed to the overwhelming advantages over traditional face to face teaching and learning. Online learning is characterised by animation, graphics and immediate feedback as well as it is user friendly which could have influenced the respondents' attitudes irrespective of gender.

There was a significant difference in the mean score of male and female preservice teachers' readiness towards use of online learning in Colleges of Education, Katsina State was rejected. The significant difference is in favour of the female respondents with the higher mean of 86.45 compare to the male respondents mean (81.81). Indicating that pre-service teachers' readiness towards online learning of this population is influence by their gender. This finding did not concur with the earlier result of Linjawi *et al.* (2018) carried

out a study to assess students' perception, attitudes, and readiness toward online dental education in Saudi Arabia. The results indicated that there is no significant difference between the male and female respondents ($P>0.05$).

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

In conclusion, these findings confirmed that pre-service teachers of college of education have positive perception towards online learning. It was revealed that pre-service teachers of College of Education have positive attitudes towards online learning. It indicated that Pre-service teachers of College of Education were ready to adopt online learning. This indicates that female pre-service teachers perception of online learning in Colleges of Education is higher than their male counterpart. It was shown that pre-service teachers attitude towards online learning of this population was not influenced by their gender and finally It was noted that pre-service teachers readiness towards online learning of this population was influenced by their gender

5.2 Recommendations

The following recommendations were made based on the findings of this study:

1. National Commission for Colleges of Education should encourage the use of online learning by pre-service teachers in Colleges of Education
2. The Colleges of Education lecturers in Katsina State should embrace the use of online learning in teaching since the pre-service teachers showed on the use of online learning.
3. The Colleges of Education in Katsina State should provide facilities available to increase the performance of pre-service teachers towards online learning.

5.3 Major Findings of the Study

The study focused on assessment of perception, attitude, and readiness towards online learning among colleges of education pre-service teachers in Katsina State, Nigeria. The summary of major findings of the study include:

1. Pre-service teachers of College of Education have positive and favourable perception on the use of online learning. The grand mean of respondents on perception of online learning was higher than the decision mean.
2. Pre-service teachers of College of Education have positive attitudes towards online learning. The grand mean of respondents of attitudes towards online learning was higher than the decision mean of 3.0.
3. Pre-service teachers of College of Education are ready to adopt. The grand mean of the respondents' readiness to adopt online learning was higher than the decision mean.
4. There is a significant difference in the perception of online learning between the male and female respondents. The significant difference is in favour of female respondents whose mean is higher (90.09) than the mean of the male respondents 82.13. This indicates that female pre-service teacher's perception of online learning in Colleges of Education is higher than their male counterpart
5. There is no significant difference between male and female pre-service teachers' attitudes toward adoption of online learning in Colleges of Education, Katsina State. Indicating that pre-service teachers' attitudes towards online learning of this population is not influence by their gender.

6. There was a significant difference in the mean score of male and female preservice teachers' readiness towards use of online learning. In Colleges of Education, Katsina State was rejected. The significant difference is in favour of the female respondents with the higher mean of 86.45 compare to the male respondents mean (81.81). Indicating that pre-service teachers' readiness towards online learning of this population is influence by their gender.

5.4 Suggestions for Further Research

This study investigate the perception, attitude and readiness towards online learning among pre-service Colleges of Education teachers' in Katsina State, Nigeria. This study can be replicated in other states of the federation to check whether the pre-service teachers' perception, attitude and readiness towards online learning are the same. Further study can also investigate the perception, attitude and readiness of lecturers towards the use of online learning in the universities.

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APPENDIX A

**FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.
SCHOOL OF SCIENCE AND SCIENCE EDUCATION,
DEPARTMENT OF EDUCATIONAL TECHNOLOGY**

**QUESTIONNAIRE ON ASSESSMENT OF PERCEPTION, ATTITUDE AND
READINESS TOWARDS ONLINE LEARNING AMONG COLLEGE PRE-
SERVICE TEACHER'S IN KATSINA STATE, NIGERIA**

Dear respondents,

This questionnaire is designed to elicit your responses on the above subject matter. Any information given will be used purposely for this research and will be treated with utmost confidentiality. Please respond to the items in section A by ticking in the appropriate boxes e.g

SECTION A: Demography

Name of Respondent (optional): _____

Name of College: _____

Sex: Male Female

SECTION B

Pre-service teacher's perception on the use of Online Learning

Note: SA (Strongly Agree); A (Agree); U (Undecided); D (Disagree); SD (Strongly Disagree)

S/N	Items	SA	A	U	D	SD
1	Online learning influences pre-service teacher's interest in learning					
2	Online learning encourages creative thinking by pre-service teacher's .					
3	Online learning is in line with the syllabus of the subjects involved in school settings.					
4	Online learning activities take a long time to implement.					
5	Online learning system is easier than learning under traditional method					
6	Online learning encourages communication between teachers and students.					
7	Online learning allow collaboration between teachers and pre-service teacher's efficiently.					
8	Online learning encourages collaboration between pre-service teacher's .					
9	Online learning can promote mutual assistance among pre-service teacher's .					

SECTION C

pre-service teacher's Attitude towards Online Learning in Teaching

Note: SA (Strongly Agree); A (Agree); U (Undecided); D (Disagree); SD (Strongly Disagree)

S/N	Items	SA	A	U	D	SD
1	Information obtain on online learning are never misleading.					
2	Interaction on online learning is entertaining.					
3	I get useful information on diverse areas on online learning					
4	I feel it is important to find any information whenever i want on online learning.					
5	I feel it is important to be able to access various online learning platform any time.					
6	It is important to keep up with the latest information about my discipline on online learning.					
7	I regularly use online learning because I find information I gathered through them useful.					
8	I feel interaction on online learning enhances learning processes.					
9	Online learning makes me build intimate relationship with people.					
10	Online learning allows me to interact with my professional friends.					
11	I feel confident in using online learning.					
12	I believe that online learning gives me the opportunity to acquire new knowledge.					
13	I believe that online learning enhances my learning experience.					
14	Online learning increases the quality of living because it integrates all form of media.					
15	Adopting online learning allows for increase pre-service teacher's satisfaction.					

16	It is interesting to study course that uses online learning or information.					
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SECTION D

Level of pre-service teacher's Readiness towards Online Learning

Note: SA (Strongly Agree); A (Agree); U (Undecided); D (Disagree); SD (Strongly Disagree)

S/N	Items	SA	A	U	D	SD
1	I like to use my own phone for online assignment					
2	I am confident when using my phone for online learning					
3	Online learning provides me with new methods to learn					
4	Online learning will bring new opportunities for learning among teachers and students					
5	Online learning can save my time					
6	I find online learning easy, as it is possible to learn what I want					
7	Online learning enables me to get feedback more quickly than before					
8	Online learning is more flexible than traditional learning; it can be carried out at any time, and anywhere					
9	It is possible to achieve personal educational aims through online learning					

APPENDIX B



FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
DEPARTMENT OF EDUCATIONAL TECHNOLOGY

Dear Sir/Madam,

Instrument Validation Form

The bearer is a student of the above named University and Department. She/he is conducting a research and you have been selected as one of those with requisite expertise to validate his/her instrument. Kindly grant him/her all necessary assistance to make the exercise a success.

Your competency and expertise was considered as factors that will serve to improve the quality of his/her research instrument. We therefore crave for your assistance in validating the instrument. The completion of the form serves as evidence that the student actually validated the instrument

Thanks for your anticipated assistance.

DR. ACABI THOMAS OMOJAWO [Signature] 14/00/2019 [Date] [Official Stamp]

Head of Department (Signature, Date & Official Stamp)
Student's Surname: LANAR GIDAO Other Names:

Registration Number: MTECH/STE/07/6897 Programme: Master's

Title of the Instrument: Student Perception, Attitude and Readiness towards Online Learning Instruction

ATTESTATION SECTION

Summary of the Remark on the Instrument: THE INSTRUMENT IS STANDARD AND IS WITHIN THE LEVEL OF THE STUDENTS.

I hereby attest that the above named student brought his instrument for validation

Name of Attester: DR. ADAMU ZUBAIRU ENUTI

Designation: LECTURER

Name and Address of Institution: FUT, MINNA

Phone Number: 08136328687 E-Mail: adamuzubairu@futminna.edu.ng

Please comment on the following

1. Appropriateness of the instrument for the purpose it's design for.....
APPROPRIATE
2. Clarity and simplicity for the level of the language used.....
CLEAR
3. Suability for the level of the targeted audience.....
SUITABLE
4. The extent in which the items cover the topic it meant to cover.....
COVERED
5. The structuring of the Questionnaire.....
STANDARD
6. Others (grammatical errors, spelling errors and others).....
MINOR
7. General overview of the Instrument.....
OKAY

Suggestions for improving the quality of the Instrument

1. THE INSTRUMENT IS SUBJECT TO BE REVIEWED
- 2.
- 3.
- 4.
- 5.

Name of Validator: DR. ABANI UBARI ENTI
Area of Specialization: EDUCATIONAL TECHNOLOGY
Name of Institution: FUJIMUDA Designation: Lecturer
Signature: Abani Date: 16/10/19

Thank You



FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
 SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
 DEPARTMENT OF EDUCATIONAL TECHNOLOGY

Dear Sir/Madam,

Instrument Validation Form

The bearer is a student of the above named University and Department. She/he is conducting a research and you have been selected as one of those with requisite expertise to validate his/her instrument. Kindly grant him/her all necessary assistance to make the exercise a success.

Your competency and expertise was considered as factors that will serve to improve the quality of his/her research instrument. We therefore crave for your assistance in validating the instrument. The completion of the form serves as evidence that the student actually validated the instrument

Thanks for your anticipated assistance.



DR ACAB! Thomas Ometayo *[Signature]* 14/07/2019

Head of Department (Signature, Date & Official Stamp)

Student's Surname *LUWA* *GIDAO* Other Names

Registration Number *MTECH/STE/07/8997* Programme *Master's*

Title of the Instrument *Student perception, Attitude and Readiness toward online Learning questionnaire*

ATTESTATION SECTION

Summary of the Remark on the Instrument

Satisfactory

I hereby attest that the above named student brought his instrument for validation

Name of Attester *Dr. Rabiu M. Zelu*

Designation *Dr. Lecturer*

Name and Address of Institution *FUT Minna*

Phone Number *08035927009* E-Mail *dr.rabiu@futminna.edu.ng*

Please comment on the following

1. Appropriateness of the instrument for the purpose it's design for..... *Appropriate*
2. Clarity and simplicity for the level of the language used..... *clear*
3. Suability for the level of the targeted audience..... *Justable*
4. The extent in which the items cover the topic it meant to cover..... *Adequate*
5. The structuring of the Questionnaire..... *Adequate*
6. Others (grammatical errors, spelling errors and others)..... *highlighted*
7. General overview of the Instrument..... *The candidate can go ahead with the study.*

Suggestions for improving the quality of the Instrument

1.
2.
3. *As observed above*
4.
5.

Name of Validator..... *Dr. Prabir M. Zello*
Area of Specialization..... *Science Education*
Name of Institution..... *FPM* Designation..... *Sr. Lecturer*
Signature..... *[Signature]* Date..... *16/10/19*

Thank You



FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
 SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
 DEPARTMENT OF EDUCATIONAL TECHNOLOGY

Dear Sir/Madam,

Instrument Validation Form

The bearer is a student of the above named University and Department. She/he is conducting a research and you have been selected as one of those with requisite expertise to validate his/her instrument. Kindly grant him/her all necessary assistance to make the exercise a success.

Your competency and expertise was considered as factors that will serve to improve the quality of his/her research instrument. We therefore crave for your assistance in validating the instrument. The completion of the form serves as evidence that the student actually validated the instrument.

Thanks for your anticipated assistance.

DR. ALABI THOMAS OMOIATO [Signature] 14/07/2019 [Official Stamp]

Head of Department (Signature, Date & Official Stamp)

Student's Surname: LAWAL GIDADO -- Other Names

Registration Number: MTECH/SS/107/6897 Programme: Masters

Title of the Instrument: Student perception, Attitude and Readiness towards online Learning questionnaire

ATTESTATION SECTION

Summary of the Remark on the Instrument: The instrument on perception, attitude and readiness is generally OK.

I hereby attest that the above named student brought his instrument for validation

Name of Attester: Dr. C. S. Tukur

Designation: Lecturer

Name and Address of Institution: FUT Minna

Phone Number: 081-773-71086 E-Mail: tukursside@futminna.edu.ng

Please comment on the following

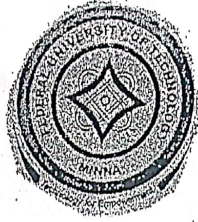
1. Appropriateness of the instrument for the purpose it's design for..... *A. To make*
2. Clarity and simplicity for the level of the language used..... *Clear and*
3. Suability for the level of the targeted audience *Sample* *To the targeted audience the instrument is suitable*
4. The extent in which the items cover the topic it meant to cover..... *it had extensively covered the topics*
5. The structuring of the Questionnaire..... *well structured*
6. Others (grammatical errors, spelling errors and others)..... *Minimal*
7. General overview of the Instrument..... *Good*

Suggestions for improving the quality of the Instrument

1. *If corrections are effected the*
2. *students quality would have impro*
3.
4.
5.

Name of Validator..... *Dr. C.S. Tukuru*
Area of Specialization..... *Educational Technology*
Name of Institution..... *F.U.T. Mung* Designation..... *Lecturer*
Signature..... *[Signature]* Date..... *24/10/19*

Thank You



FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
 SCHOOL OF SCIENCE AND TECHNOLOGY EDUCATION
 DEPARTMENT OF EDUCATIONAL TECHNOLOGY

Dear Sir/Madam,

Instrument Validation Form

The bearer is a student of the above named University and Department. She/he is conducting a research and you have been selected as one of those with requisite expertise to validate his/her instrument. Kindly grant him/her all necessary assistance to make the exercise a success.

Your competency and expertise was considered as factors that will serve to improve the quality of his/her research instrument. We therefore crave for your assistance in validating the instrument. The completion of the form serves as evidence that the student actually validated the instrument

Thanks for your anticipated assistance.

DR ACABI Titimias Omotayo 14 OCT 2019

Head of Department (Signature, Date & Official Stamp)

Student's Surname... LAWAL GIDAO Other Names.....

Registration Number... MTECH/STSE/07/16897 Programme... MASTERS

Title of the Instrument... Pre-service TEACHER PERCEPTION, ATTITUDE AND READINESS TOWARDS ONLINE LEARNING QUESTIONNAIRE

ATTESTATION SECTION

Summary of the Remark on the Instrument... The instrument is adequate and if corrections are made it will be better.

I hereby attest that the above named student brought his instrument for validation

Name of Attester... Dr. S.E.A APARA

Designation... Senior Lecturer

Name and Address of Institution... T.B.B. University

Phone Number... 07032212214 E-Mail.....

Please comment on the following

1. Appropriateness of the instrument for the purpose it's design for.....
..... Good
2. Clarity and simplicity for the level of the language used..... It is clear
3. Suability for the level of the targeted audience Adequate
4. The extent in which the items cover the topic it meant to cover..... Adequate
5. The structuring of the Questionnaire..... It is well structured
6. Others (grammatical errors, spelling errors and others).....
7. General overview of the Instrument..... It is okay for the subject matter

Suggestions for improving the quality of the Instrument

1. check grammatical corrections
2. give it to other experts
3.
4.
5.

Name of Validator..... Dr. S.E.A. APARA

Area of Specialization..... Counseling Psychology

Name of Institution..... IBB University..... Designation..... S-L

Signature..... [Signature]

Date..... 11-02-2020

Thank You