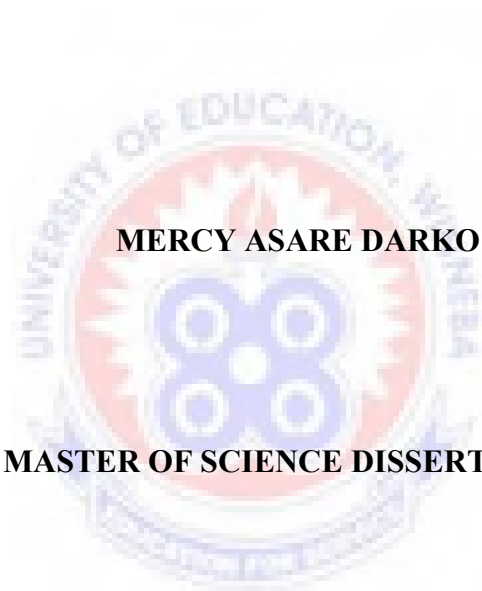**UNIVERSITY OF EDUCATION, WINNEBA**

INTEGRATION OF ICT IN DISTANCE LEARNING EDUCATION:

EMPIRICAL EVIDENCE FROM UEW

MERCY ASARE DARKO

MASTER OF SCIENCE DISSERTATION

2021

UNIVERSITY OF EDUCATION, WINNEBA

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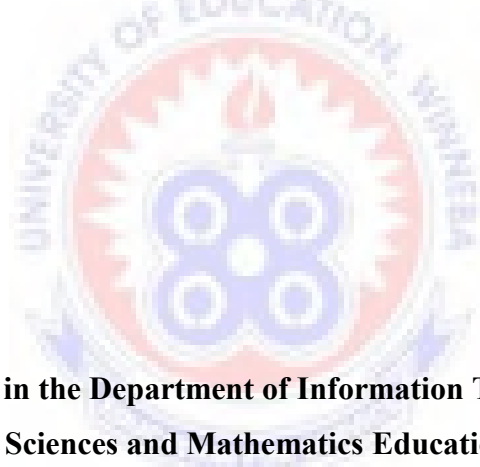
MERCY ASARE DARKO

A dissertation in the Department of Information Technology Education,
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of Graduate Studies in partial fulfilment
of the requirements for the award of the degree of
Master of Science
(Information Technology Education)
in the University of Education, Winneba

MAY, 2021

DECLARATION

STUDENT'S DECLARATION

I, **MERCY ASARE DARKO**, declare that this dissertation, with the exception of quotations and references contained in the published works, which have all been identified and duly acknowledged, is entirely my own original work, and has not been submitted, either in part or whole for another degree elsewhere.

SIGNATURE: ……………………………………………

DATE: ……………………………………………………

SUPERVISOR'S DECLARATION

I hereby declare that the preparation and presentation of this work was supervised in accordance with the guidelines for supervision of dissertation as laid down by the University of Education, Winneba.

DR. EBENEZER BONYAH

SIGNATURE: …………………………………………

DATE: ……………………………………………………

DEDICATION

To God Be the Glory. This research work is dedicated to my children Kirstyn Niena

Opoku, Brian Amankwah Opoku, Aaron Nana Kwame Opoku, and Jaden Opoku.

ACKNOWLEDGEMENTS

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ABBREVIATION

LMS   Learning Management System

IDeL   Institute for Distance and e-Learning

DE   Distance Education

ICT   Information and Communication Technologies

UEW   University of Education, Winneba

UTAUT   Unified Theory of Acceptance and Use of Technology

SPSS   Statistical Package for the Social Science

IEDE   Institute for Educational Development and Extension

ABSTRACT

The study investigated the integration of ICT in distance learning education at the University of Education Winneba. Over the years, the distance department has not engaged in purely online distance mode learning until the Covid-19 pandemic forced the school to adopt so. Despite the distance learning success rate, there are many challenges, technology usage obstacles, ICT tools, and adopted practices that needed to be explored for both theoretical and practical implications. The study reviewed concepts, theories, and empirical studies to provide broader insight into the objectives. Using exploratory research design with a quantitative data analysis approach, the researcher focused on students of the Institute for Distance and e-Learning (IDeL), lecturers or tutors, management, and administrative staff of the information technology (IT) support department of UEW. 120 students, tutors, or lecturers, and administrators participated in the study. The study used an online survey to collect information from the respondents. The data were analyzed with the help of Microsoft Excel and SPSS. The study revealed that the most used ICT devices in distance education (DE) are computers, laptops, and smartphones. Also, the paper provided evidence that the major roles of ICT in DE are; information search, create better learning atmosphere, easy download material, learn everywhere anytime, flexible and convenient to distance education, easily interact with classmates, save time, helps focus on learning and makes learning interesting. The study identified some challenges in ICT integration in distance education. Among some are; inadequate orientation on how to study online, network interruption, inadequate modern computers or laptops, and unfavorable geographical location. It is concluded that there is a positive correlation between *effort expectancy* and LMS *user behavioral intention*. This implies that users or learners who have the positive behavioral intention to embrace LMS need to put effort to achieve learning outcomes. Whereas the study found no correlation between "perceived cost, facilitating condition and performance expectancy, and user intention".

Keywords: ICT, distance education, LMS, integration, UTAUT theory

CHAPTER ONE

INTRODUCTION

This section describes the study's research background and significance, statement of the problem, objectives of the study, scope of the research, study approach, and how the whole research is organized. Moreover, the author outlines the need for exploratory research in distance education in Ghana, its contribution to literature, and the empirical support to address the research gap.

1.1 Research Background

Scholars for on-campus college students have extensively investigated the role of learning strategies in achieving academic success. However, among distance education (DE) students, research on this relationship is limited, and this group of learners is growing. To supplement the mainstream or regular education, most public universities have implemented distance education programs in Ghana. Distance education in Ghana has largely become successful thanks to information and communication technology systems. In the 21st century, Distance learning (DL) has become a universal and developing phenomenon giving a tremendous boost to the use of Information and Communication Technologies (ICT) in tertiary institutions (Markova et al., 2017).

Formal education is entering and providing a collective role in the global economy's competitive market in recent times. Besides, such distance education has endeavored to safeguard normalization and uniformity in meeting the global trends in the highly competitive demand for excellence in distance education programs to produce highly qualified manpower needs. Governments, the ministry of education, and university councils in Ghana have embarked on a comprehensive recapitalization program of

higher education through distance learning mode. Concerning the attempts to improve the quality of distance education, there is a need to integrate ICT. Ololube et al. (2015) believe that the use, integration, and dissemination of information and communication technology has created a new educational methodology era. Therefore, it fundamentally changes the traditional teaching model and provides contemporary learning methods: teacher and student experience. Nevertheless, the University of Education Winneba (UEW hereafter) is part of this modern learning experience through distance learning education and ICT. Arrosagaray, et al. (2019) concluded that the use of ICT generates a change in educational organizations' structure promoting a new culture that allows us to advance in the corporate environment's knowledge. The introduction of ICT in distance learning education by UEW gave a unique perspective of knowledge dynamism to teachers and the learners. Since its integration, the expected benefits to all stakeholders have not been given much attention by researchers. This study aims to discover the significance of introducing ICT in distance learning education, its implementation requirements, and organization and suggest ways to effectively conduct distance learning education.

1.2 Statement of the Problem

Contemporary young people are designated as digital natives characterized by the chronic use of ICT in everyday life. Nevertheless, the current higher education environment demands more sophistication from students (Slechtova, 2015). These young people are now university students, and the academic world is faced with educating students who are considered to be quite different from previous generations. It is said that they learn better from discovery and experimentation, prefer teamwork, prefer audiovisual resources, have multitasking capabilities, depending on the use of

ICT, and always connect with others through ICT (Oblinger & Oblinger, 2005). Interestingly, the University of Education Winneba offers distance education but less ICT integration since students and teachers meet on weekends or vacations. It is challenging to bring all students and teachers to have lessons online, access course modules, undertake examinations, projects, and assignments. To explore and find a lasting solution to this problem, it is necessary to assimilate a strong ICT base for significant distance learning interaction. Using the internet or online for teachers and students to study is not far from reach since useful research and planning are antecedents.

The education system has fully realized ICT's potential as a valuable assisting tool in teaching and learning. During the COVID-19, where some colleges adopted distance online learning, it was found that the teaching methodology and interaction between teachers and students play a decisive role in the use of ICT by students, whether they belong to the internet generation or not. Thus, the study aims to explore the impact of integrating ICT in distance learning education at the University of Education Winneba.

1.3 Research Objectives

This research aims to determine students' perceptions, motivations, and success rate in those studies with ICT-based technology-supported environments at distance education. The study will evaluate these outcomes to assess ICT applications' potential issues through the distance learning process in higher education institutions by conducting exploratory analysis. Specifically, the study is set to achieve the following:

1. Identify the major ICT tools used in distance learning education

2. Find out the roles of ICT in distance learning education.

3. Examine the challenges of integrating ICT into distance learning education.

4. To explore the experience of the Learning Management System (LMS) by distance learning students.

5. Suggest recommendations to improve ICT in distance learning education.

1.4 Research Questions

To maintain a clear sense of focus in this study, the author put forth these questions;

1. What are the ICT tools used in distance learning education in UEW?

2. What are the roles of ICT in distance learning education at UEW?

3. What are the challenges of integrating ICT into distance learning education?

4. How does the learning management system (LMS) influence distance learning students?

5. What suggestions could improve ICT usage in distance learning education?

1.5 Significance of the Study

There are many distance education centers among all the public universities in Ghana. All these programs are carried out on weekends on vacation bases. As seen in other developed countries, the actual technology-based distance interactive learning is not seen fully in UEW. Moreover, this paper will be beneficial to the management of UEW, administrators, students, educationists, and other interested readers and researchers.

➢ In this study, the conclusion and literature will contribute to how to execute computerized distance learning mode.

➢ This report highlights the requirements for distance learning education from students, lecturers, and administrators' perspectives.

➢ The study will present the external factors and partners that would help to make distance education more practical in the university.

➢ This project will provide a sense of focus, discussing the need and usefulness of distance education for the university and the country workforce.

➢ It will rekindle and give hope to the study of ICT, choice of study, and modernization of education alongside the main segregation.

1.6 Scope of the Study

This study will focus on the UEW distance learning education system. Although the university distance system is not much different from other public universities, interested readers can narrowly generalize this study outcome. The researcher will specifically target the institute for distance and e-learning department, and university management to get enough insight for the study.

1.7 Research Methodology

This study adopted an exploratory research design with a quantitative data analysis approach. The author chose this design to make an extensive investigation into distance learning and better understand the problems and make broad suggestions to implement the findings. In executing this approach, questionnaires seem fit to obtain first-hand data for analysis. Close-ended and open-ended questions items were designed and administered to 120 respondents. The author focused on the students of the Institute for Distance and e-Learning (IDeL), sandwich students, lecturers, management, and staff of information technology (IT) department since they constitute the distance learning education in the university.

The two major statistical tools for data analysis are Microsoft Excel and Statistical Package for the Social Science (SPSS). The following test was conducted to ascertain the data's validity and reliability; Cronbach's alpha reliability test, Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) test, exploratory factor analysis tests (EFA), etc. In discussing the main research objectives, independent t-test, mean, average variance, standard deviation, factor analysis, cross-tabulations, etc., will be presented in tables and diagrams.

1.8 Organization of the Thesis

This study is group into five main chapters. Chapter one describes the study's background, statement of problem, purpose, and significance of the research. Chapter two presents the literature, and it will highlight the contribution of related and relevant previous studies on distance learning education. It also includes the theoretical framework or conceptual model of research; thus exploring distance-learning education in UEW and supporting theories. The third chapter is about the research design, data collection method, and data analysis plan. In chapter four, the author analyzes the data and discuss the results of the findings. Chapter five is the conclusions and recommendations. The researcher highlights the theoretical and practical implementation of the study findings, makes constructive conclusions based on the data findings, and puts forth the future research directions and the study's limitations. The whole study organization is summarized and illustrated in figure 1.

chapter 1 • introduction • chapter 2 • literature review	→	chapter 2 Literature • UEW distance education system • conceptual model	→	chapter 3 • methodology

chapter 5
• conclusions and recommendations
← chapter 4
• data analysis
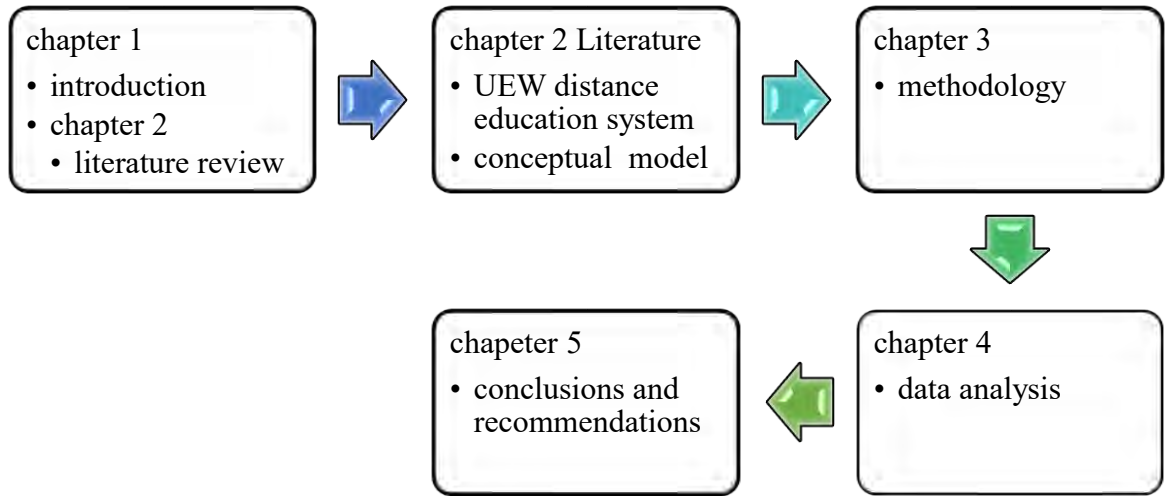
Figure 1: Organization of the thesis

CHAPTER TWO

REVIEW OF LITERATURE

The study aimed to investigate ICT integration in distance education at UEW. For background and literature contributions, related and most relevant previous studies, models, theories, findings, and conclusions that contribute significantly to integrating ICT in distance learning education have been thoroughly discussed. The literature review has been grouped into a theoretical, empirical, and conceptual review covering these key variables; distance education, technologies in distance education, constraints in distance education, study framework, etc.

2.1 Theoretical Review

This section of the literature reviews related theories, concepts of distance education and ICT, and ICT facilitating distance learning roles. Many scholars have linked and propound theories for a better understanding of distance education. For this study, four concepts would be reviewed; transactional distance, interaction, learner control, and social presence.

2.1.1 Transactional distance

Moore's (1990) concept of "transactional distance" covers the distance that exists in all educational relationships. Distance depends on several conversations between learner and instructor and also, number of structures in the curriculum design. When the structure of the education plan is more, and the dialogue between students and teachers is less, there will be greater transaction distance, which may be found in some traditional distance education courses. Education provides a continuous range of transactions, from the farther the distance, the more interaction, the less structure, the

farther the distance, the less interaction, and the more structure. Because of the variety of transactions between teachers and learners in these two situations, this continuity blurs the distinction between traditional courses and distance courses. Therefore, distance is not determined by geography but by the relationship between dialogue and structure.

Saba and Shearer (1994) researched on the relationship between dialogue and structure in transaction distance by proposing a system dynamics model, which further took the concept of transaction distance. Saba and Shearer concluded in their research that as learner control and conversation increase, transaction distance decreases. It is not the position that determines the teaching effect, but the volume of transactions between the learner and the instructor. This concept affects both traditional classrooms and distant classrooms. The use of integrated telecommunications systems can allow for a greater variety of transactions, thereby improving conversations to minimize transaction distances.

2.1.2 Interaction

Interaction is the second theoretical model that distance educators have recently paid attention to, and it has received a lot of attention in the theoretical literature. Moore (1989) discussed the three types of interaction that are essential in distance education. (1) Teacher-student interaction is an integral part of his model, which provides motivation, feedback, and dialogue between teachers and students. (2) The interaction between learner andcontent is a way for students to obtain knowledge and information from the material. (3) The interaction between learners and learners refers to exchanging information, ideas, and dialogues between students about the course,

regardless of whether this exchange is carried out in a structured or unstructured manner. The concept of interaction is critical to the effectiveness of distance education programs and traditional programs. Hillman, Hills, and Gunawardena (1994) have further advanced the idea of interaction and added a fourth part to the model learner-interface interaction. They point out that the interaction between the learner and the technology that provides instruction is a key component of the model, not provided in the literature. They proposed a new paradigm, which includes understanding the use of interfaces in all transactions. Learners who do not have the basic skills required to use communication media will spend a lot of time learning to interact with technology and spend less time learning courses. Therefore, instructional designers must include learner interface interaction so that learners can successfully interact with intermediary technologies.

2.1.3 Control theory

The third theoretical concept that has received attention in the distance education literature is independence and learner control. Studies examining locus of control (Altmann & Arambasich, 1982; Rotter, 1989) conclude that students who perceive that their academic success is a result of their accomplishments have an internal locus of control and are more likely to persist in their education. Students with an external locus of control feel that their success, or lack of it, is due largely to events such as luck or fate outside their control. Thus, externals are more likely to become dropouts. Factors of control that influence dropout rates have been of concern to distance educators as they search for criteria to predict successful course completion. Baynton (1992) developed a model to test the concept of control, defined by independence, capability, and support. She pointed out that control is more than independence. It needs to strike

a balance between three factors: learner independence (the opportunity to make choices), ability (ability and skills), and support (people and materials). Baynton's factor analysis confirms the importance of these three factors. It suggests other factors that may affect the concept of control, which should be checked to accurately describe the complex interactions between teachers and students in a distance learning environment.

2.1.4. Social context

Finally, the social environment for distance learning is becoming an important research field. Theorists are studying how the social environment affects motivation, attitudes, teaching, and learning. It is generally believed that technology is culturally neutral and can be easily used in various environments. However, the media, materials, and services are often transferred inappropriately without paying attention to the social environment or the local recipient's culture (McIsaac, 1993). Often use technology-based learning activities without paying attention to the impact on the local social environment. Computer-mediated communication attempts to reduce discrimination patterns by providing equal social interaction between participants, who may be anonymous in terms of gender, race, and physical characteristics. However, there is evidence that social equality factors may not extend to, for example, participants who are not good writers but must communicate mainly in the form of text (Gunawardena, 1993). It is particularly important to check social factors in a distance learning environment. In this environment, the communication process is mediated, and the social atmosphere created is quite different from the traditional environment.

2.2 The Concept of Distance Education

Many authors have given different definitions of distance education. Most of the explanations have similarities and discrepancies based on the scholar's context, focus, and perspective. Sadeghi (2019) simply defined distance education as the kind of education in which students may not always be physically present at a school. According to Schlosser and Simonson (2019), distance education is ''institution-based formal education where the learning group is separated, and where interactive telecommunications systems are used to connect learners, resources, and instructors''. This definition has gained extensive acceptance because it presents major distinguishing characteristics of distance education. The authors first proposed that distance education is carried out through institutions, not self-study or a nonacademic learning environment. These institutions may or may not provide traditional classroom teaching, but they can be accredited by the same institutions that use traditional methods. Secondly, geographical separation is inherent to distance learning, and time may also separate students and teachers. Third, interactive telecommunications connect the learning group with the teacher. Finally, distance education, like any other education, establishes a learning group, sometimes called a learning community composed of students, teachers, and teaching resources. Commenting on Schlosser and Simonson's (2019) definition, distance education features are wholly seen or partly inherent by most universities operating distance education.

Third, Delling (1966) believes that distance education is a planned and systematic activity, including selection, preparation of lectures, introducing teaching materials, and supervision and support of students' learning. This is achieved by reducing the physical distance between students and using at least one appropriate technical medium with the teacher. The definition of Delling fails to allow the formal institutions or

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universities that host and recognize the program to be recognized. Moore (1990) defined distance education as all the arrangements for providing instruction through print or electronic communications media to a person engaged in planned learning in a place or time different from that of the instructor or instructors. According to Honeyman and Miller (1993), as reported in Edwin and Asabere (2016), Distance Education (DE) or Distance Learning is a field of education that focuses on the pedagogy, technology, and instructional system designs that aim to deliver education to students who are not physically present "on-site" in a traditional classroom or campus. The definition did not recognize the inclusion of young learners (andragogy) in distance education. As seen in the 21st-century young children now take distance learning as practice during the Covid-19 pandemic era in China and other developed countries. Also, Essuman (2014) argued that presently anyone is potentially a distance learner, a concept that has implications for Africa.

Similarly, Caruth and Caruth (2013) defined distance education as "teaching where students and tutors are separated during the entire learning process." The authors' definition did not mention how teachers and learners interact but maintain distance learning's geographical elements. From the perspective of Mnyanyi & Mbwette (2009), "distance education is a learning process in which teachers and learners are separated in space and time; the communication between the two is carried out through printed media or ICT, and learning is Under the control of the learner, not the teacher." Based on the various definitions, this study defines distance education as *"the process whereby an institution provides a medium for learners and instructors to interact with the aid of technology which is certified and recognized by the appropriate authority."*

2.3 Advantages of Distance Learning

Distance learning might not be the best choice for every student seeking to pursue a college degree or university program. Still, the list of advantages seems to outweigh the list of disadvantages.

2.3.1 A study from Anywhere, Anytime

The best thing about distance education is that you can study anytime, anywhere. In the country where you live, you can join the course and start learning. It doesn't matter even if the course is provided by an international school, if you are a citizen of another country, you can easily get course materials. Get all knowledge and training anywhere on the planet (Nagrale, 2013).

2.3.2 Saving a Significant Amount of Money

According to research by Bijeesh (2017), for any given course, the cost of a distance education degree (online or otherwise) may be cheaper than the cost of a regular campus degree. Students looking for economically viable options can participate in distance learning programs. You do not have to live in the same city or country to attend the learning institution of your choice. A learner can read anywhere you have access to your computer and Internet connection. Also, courses offered by distance learning centers are cheaper than courses offered by traditional education centers (Brown, 2017).

2.3.3 No Commuting

Nagrale (2013) pointed out that you don't have to take a crowded bus or local train if you choose distance education. You need a computer with an internet connection in your home. The entire college is in your bedroom, so you don't have to go out.

Commuting is the most difficult part, because you waste a lot of time, money, and more importantly, energy. No one likes to commute for long hours.

2.3.4 Flexibility to Choose

Learners will have to follow a set schedule of learning as per the school's curriculum if they follow traditional ways of learning. But different types of distance learning allow learners to set their learning schedule as per their convenience without following a regular schedule of learning. Even if they are out of touch with the formal learning process, the distance learning program offers the flexibility to choose their learning course. (Brown, 2017).

2.3.5 Saving Time

Bijeesh (2017) believed that there is no time wasted in college, and no time is wasted waiting for a bus or train. In the distance learning program, your classroom is in your bedroom, the study materials on the desk, or the computer's electronic materials. Students who do not have enough time can choose distance education and study comfortably at home.

2.3.6 Earn While You Learn

For those who want to improve their resume by getting a higher education without breaking their existing job, distance learning can be the best option. Learners can earn their livelihood and improve their qualification as distance learning will accommodate both learning and earning (Brown, 2017).

2.4 Disadvantages of Distance Learning

Although distance learning offers more people an opportunity to attain higher education, it is not all advantageous.

2.4.1 High Chances of Distraction

According to Bijeesh (2017), since there are no faculty and staff for face-to-face interaction, and no classmates can constantly remind of unfinished assignments, there is a high chance of distraction and missed deadlines. If you want to complete a distance learning course, you need to stay motivated and focused. If you tend to procrastinate and do not comply with deadlines, distance education is not a good idea. Besides, if you have any questions, you must clean up yourself without teachers or friends' help because you cannot talk to friends and other colleagues you do in normal university courses (Nagrale, 2013). It only requires self-motivation and focuses to complete a course (Brown, 2017).

2.4.2 Complicated Technology

Brown (2017) explained that any student seeking to sign up for a distance learning program needs to invest in a range of equipment, including computers, webcams, and a stable Internet connection. Since teaching is conducted through the Internet, there is no physical contact between students and teachers. Over-reliance on technology is the main disadvantage of distance learning. If there is any software or hardware failure, the class meeting will be paused, interrupting the learning process. Also, the complexity of the technology used in distance learning limits online education only to students proficient in computers and technology.

2.4.3 No Social Interaction

Learners usually study alone, so they may feel isolated and miss the social interaction resulting from participating in a traditional classroom. Moreover, they did not have the opportunity to practice oral lessons. The lack of physical interaction in the education process can cause many problems, such as high burning and isolation (Dyrud, 2000). Brown (2017) asserted that studying in physical institutions can allow students to meet and interact with people from different places personally. Distance learning only limits students to web-based courses and learning materials. Although students can interact through chat rooms, discussion boards, e-mail, and/or video conferencing software, the experience cannot be compared to traditional campuses. The controversial study by Hara and Kling (2000) also found that it may not be possible to fully understand the difficulties and perplexities encountered by online students. Working alone at night can lead to many complicated and frustrating experiences.

2.4.4 Difficulty Staying in Contact with Instructors

Suppose learners encounter problems with homework or speeches when conducting traditional courses. In that case, it is usually easy to talk to the instructor before or after class or to arrange online meetings at other times. However, when learners are doing distance learning, it will be difficult for them to get in touch with the teacher. Although they can send emails, they will not get an immediate response if they can sit down with the teacher (Hutt, 2017).

2.4.5 Job Markets Do Not Accept Online Degrees

Nagrale (2013) believes that if you rely on distance education to obtain a degree, it can be very dangerous. You may get a degree, but private companies in the job market will not recognize you, and you will not encounter the same problems in government work.

However, employers prefer a degree from a regular college to online or distance education. They believe that distance education is still not a serious form of education.

2.5 An overview of Information Communication Technologies

Information Communication Technologies (ICTs) are defined as electronic technologies for collecting, storing, processing, and communicating information. They can be separated into two main categories. The first category is those who process information, such as computer systems. The second category includes those who disseminate information, such as telecommunications systems (Gunton, 1993). Moreover, ICT is used to describe various technologies for gathering, storing, retrieving, processing, analyzing, transmitting, and sharing information (Maro, 2008). Furthermore, Hameed (2006) defines ICT as a comprehensive theme concerned with technology and other aspects of managing and processing information and involves using electronic computers and computer software to convert, store, protect, process, transmit, and retrieve information. Technologies included in ICT are; Radio and Television (broadcasting technology), telephone, computers, and the internet.

2.5.1 Information Communication Technologies in Education

In the past educational institutions provided little choice for students in terms of how programs were delivered. Students were typically forced to accept what was delivered, and institutions tended to be quite static and traditional in delivering their programs. At present, the use of ICTs provides many options and choices, and many institutions are now creating competitive edges for themselves through the choices they are offering students. These choices extend when students can choose to learn to where they teach (Oliver, 2015). Also, the emerging ICTs contribute significantly to the content of

education curricula and how they dominate so much of contemporary life and work (McCausland et al., 1999).

As computers and the internet continue to transform the economy and society, the role of information communication technologies (ICTs) in fostering development has become more generally recognized. If one was to compare such fields as medicine, tourism, travel, business, law, banking, engineering, and architecture, the impact of ICTs across the past two or three decades has been enormous (Oliver, 2017). Information and Communication Technologies (ICTs) are forces that have changed many aspects of the way we live. As a result, Judy and Angela (2008) observed that there had been fundamental shifts in the way teaching and learning were perceived and conducted within the tertiary education sector over the last two decades. One is a move from teacher-centered to student-centered education. The other is a move from the traditional to the virtual classroom.

Information Communication Technologies (ICTs), in most cases, have most essentially had tremendous success in providing services at reduced costs to the people's doorsteps and for making higher education available to all classes of people. As a result, on the one hand, people will be entitled to higher education, and on the other hand, they will acquire the necessary knowledge, skills and experience to serve the country and prosper (Blurton, 2018).

Due to technological development, the education sector has undergone rapid changes. Now, various information and communication technologies will become tools to help expand access to education, enhance education's relevance to the increasingly digital workplace, and improve education quality, making teaching and learning a fascinating

activity (Shah and Shafiul, 2010). These further indicate that the application, popularization and deployment of information and communication technologies have fundamentally changed how education is conceived and delivered to students. Due to its ease of use, this educational method has become very popular worldwide. Therefore, after developing the education system based on information and communication technology, distance education has been developed. There is no doubt that Information and Communication Technology (ICT) holds the promise of transforming how we live in new and more powerful ways. ICT has become a strategic resource, a commodity, and a foundation of every activity from technology, communication, health to entertainment. ICT now plays a major role in distance learning and research in general (Ajayi, 2003).

2.5.2 The Use of I C T in facilitating distance learning

Presently, a new era has evolved in the education sector, utilizing ICTs. Diverse ICTs are now set to develop instrumental in helping expand access to education, strengthen the relevance of education to the increasingly digital workplace and raise educational quality by, among others, helping make teaching and learning into an engaging and active process connected to real life (Shah & Shafiul, 2010).

Mushi (2006) also has noted that learning, like other social activities, involves two or more participants who result from meaningful interactions between and among people involved. These interactions are more crucial where technology was the primary means of instruction. In such cases, there were no human physical cues to encourage interaction; rather, instruction has to be designed and delivered to perform what the instructor could have performed when teaching in a traditional classroom.

Mwakilama and Nawe (2005) reflect on the university's transformation plan. They pointed out that the application of information and communication technology in the teaching, research, and learning of colleges and universities, and the availability of information resources in electronic format to a large extent determine how colleges and universities change their traditional ways of doing things. They cited different scholars' views and believed that ICT applications in higher learning institutions provide multiple opportunities, such as the realization of distance education.

The influence of ICT on education is currently discussed almost entirely about digital media primarily, the World Wide Web. However, ICT was impacted by higher education before the widespread use of the Internet. The application of print, audio-visual, and broadcast media to distance education has enabled those with adult roles and responsibilities to continue formal study leading to higher education qualifications on a mass scale. For example, in Australia, a range of technologies, innovative in their day but often quickly superseded, have been used to good effect by various programs in the service of developing adult literacy. These have included audio-cassettes combined with printed text, radio, interactive videodisc, narrowcast television, teleconferencing, and various desktop computer applications such as hypermedia, word processing, language-drills programs, shell programs, and text manipulation and storytelling programs (Anderson, 1991).

2.5.3 Technology medium used in distance education

Distance education programs have been successful due to advanced technology in this contemporary world. There are apps and other technology tools that make distance learning more interactive and interesting. Among some of the technological media are discussed below;

a) *Digital interactive television (DiTV)*

Broadcast television continues to be an important and widely used medium for the delivery of distance education and has been the subject of much research. An example is Joy Prime learning education. However, Digital TV is fast becoming a mass medium in the UK, USA, and others. Satellite/digital/cable TV ownership has also increased dramatically over the past few years. A clear majority of UK homes now receive digital services (Higham, 2003). Some 28.2 million live in multi-channel homes against 27.2 million who still receive analog services. The advantage of digital TV over the traditional analog system is the better image quality and enhanced capacity (Niiranen et al., 2002). TV companies can provide personalized interactive services such as web access, banking, and e-mail (Love and Banks, 2001). It is often overlooked in discussions on e-learning that learning via TV may be equally viable and significant and encourages widening participation in a more effective way, perhaps than e-learning.

b) *Video-conferencing*

Video-conferencing is generally two-way and carries audio and video information so that people at two or more sites can see and hear each other. Many medical studies have been undertaken using video-conferencing facilities. For example, Brunk (2002) describes an initiative to provide nutrition counseling for elderly people in Nevada. Similarly, Swindell and Mayhew (1996) provided 18 housebound elderly people with an eight-week teleconference offering practical nutrition, health, and social services. Education for health professionals has also been offered via this medium. Andrusyszn et al. (2000) used a video-conferencing facility and asynchronous computer conferencing to enhance learning and promote international collaboration among graduate nursing students.

c) *Audio-conferencing*

Audio-teleconferencing may be described as two-way voice communication using standard telephone type technology (Kirby and Boak, 1987). While not as sophisticated as video-conferencing, audio-conferencing also facilitates interaction. Research into the use of audio-conferencing is rare. In one of the few studies to date, Cragg (1991) examined the experience, learning strategies, and reported learning of nurses taking a course either by audio-teleconference or correspondence. She found that the teleconferences encouraged group learning; although correspondence was more convenient.

d) *World wide web/internet*

The worldwide web is becoming ever more exploited in education. According to Olson and Wisher (2002), Web-based education offers learners "unparalleled access to instructional resources, far surpassing the reach of the traditional classroom". It also makes interaction possible to a much greater extent than traditional distance education (Newman and Scurry, 2001). The use of the web in learning is not problem-free, however. Pajo (2001) identified several barriers to the uptake of web-technology by university staff. Chief among these were the time required in learning how to use web-based technology and develop appropriate courses, the lack of training, and monitoring web-based teaching.

e) *Video/audio tapes*

Audio cassettes are convenient because of their portability and because they can be used privately on headphones. This medium is used largely in language training, where the sound is of particular importance. One of the few audio pedagogy studies was that by Beare (1989), who compared the effectiveness of six instructional formats that

allowed differing interaction levels, including audio assisted independent study. Results showed that neither individual instructional formats nor the degree of interaction had much effect on student achievement. Distant learners, including those in the audio group, established the course just as thought-provoking, were equally interested in the subject matter, and judged the instructor or narrator equally as skilled as those receiving face-to-face instruction.

Video instruction became popular during the 1980s when the price of video-recorders fell, and they became a common feature in the home. Surprisingly, no work appears to have been undertaken on the use of video in terms of its use as an "on-demand" medium (i.e., on the benefits of instant replaying of material, etc.) even though much learning – in particular, to learn a foreign language, takes place using this medium. More typically, Paulsen et al. (1998) compared student achievement and satisfaction concerning course delivery via DiTV, broadcast TV, and videotape, but without examining how the media were manipulated. Student achievement was not significantly different in any of the groups.

f) Telephone/Fax/ Messenger

Of course, the telephone is generally used for one-to-one contact and forms only a minor part in distance education. Hobbs et al. (2000), cited in Finger and Rotolo (2001), examined replacing a radio service with a telephone for on-air lessons at a distance education school in Queensland, Australia. The researchers found many benefits of the telephone over the radio, including a greater understanding of learning tasks, increased motivation, more participation, improved enjoyment, and a greater range of teaching strategies being utilized.

g) CD-ROM/pen drive

CD-ROMs allow multimedia to be captured onto a laserdisc and used with personal computers. Little research appears, surprisingly, to have looked at CD-ROM mediated learning. In one of the rare studies to have looked at this medium, Oviatt et al. (2000) found that using a CD-ROM with students undertaking a trans-national management course was not associated with better examination performance. The rise of the Internet has made the use of CD-ROM somewhat dated.

2.5.4 Innovation and quality in higher education through ICT and E-learning

Globalization and technological change are one of the central goals of ICT. One of the main sectors that should be changed and modified is education in general and higher education. All the new information and communication technologies are changing the learning process in higher education. ICT-based learning becomes more and more widespread in higher education institutions, and therefore, quality assurance processes and quality management systems are of high importance. E-education can provide access to the best gurus and the best practices or knowledge available (UNESCO, 2002).

The higher education sector plays a vital role in social and economic development in any country from all over the world. Nowadays, many universities integrate information and communication technologies to facilitate the acquisition and absorption of knowledge and align with this fast-evolving technology. The trend towards a knowledge-based economy has emphasized universities' importance as repositories of valuable human capital to secure shares in the global market.

The process of education using ICTs can be classified into e-learning, blended learning, and distance learning. Various education-related ICT products available, such as teleconferences, emails, audio conferences, TV lessons, radio broadcasts, interactive radio consultations, interactive voice response systems, cassette tapes, and CD ROMs, have been used for different purposes (Bhattacharya & Sharma, 2007).

Table 1: The Four Rationales for Introducing ICT in Education

Rationale	Basis
Social	The perceivable role that technology plays in society and the need to familiarize students with technology
Vocational	They are preparing students for jobs that require skills in technology.
Catalytic	The utility of technology improves performance and effectiveness in teaching, management, and many other social activities.
Pedagogical	to enhance learning, flexibility, and efficiency in course delivery

Source: Cross and Adam (2007)

Key advantages of ICTs used in education and e-learning include improved open access to education, better integration for non-full-time students (particularly in continuing education, provision of tools to enable students to independently solve problems, acquisition of technological skills through practice with tools and computer, cost-effectiveness and developing students' self-discipline. It is, therefore, important for a higher education institution to have innovative ICT practices in key areas, such as: open and distance learning, blended learning, research, administration, and management.

Table 2: Benefits of ICT in education to the main stakeholders

Stakeholders	Benefits
Students	✓ Increased access,
	✓ The flexibility of content and delivery,
	✓ Combination of work and education,
	✓ Learner-centered approach,
	✓ Higher-quality of education and new-ways of interaction
Employees	✓ High quality, cost-effective professional development in the workplace,
	✓ Upgrading of employee skills increased productivity,
	✓ Developing a new learning culture,
	✓ Sharing of costs and of training time with the employees,
	✓ Increased portability of training.
Government	:Increase the capacity and cost-effectiveness of education and training systems,
	✓ To reach target groups with limited access to conventional education and training,
	✓ To support and enhance the quality and relevance of existing educational structures,
	✓ To ensure the connection of educational institutions and curricula to the emerging networks and information resources,
	✓ To promote innovation and opportunities for lifelong learning.

Source: UNESCO (2002)

2.6 Empirical Review

This section presents an empirical review of ICT and distance education, factors constraining access to Information Communication Technologies to facilitate distance learning and distance education research outcome patterns.

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2.6.1 Empirical studies on ICT and distance learning education

Venkataraman and Sivakumar (2015) assessed the impact of e-learning on group-based learning on academic performance. More importantly, the study assessed the details of the e-learning methodology with students and their peers used on group-based learning and the importance of the methodology. A survey was conducted among the students and the staff members in various disciplines. It was reported that group-based learning in an e-learning environment is the best way to delivering course content to achieve positive learning outcomes.

Similarly, Mensah (2017) examined Ghanaian tertiary students' usage of ICT and concluded that laptops, tablets, and mobile phones are used mainly for social and leisure activities compared to academic duties. Again, students above the age of 31 are likely to use ICT tools for academic purposes than older students. The study concludes that efforts are needed to reduce the distractions on the part of students. Kimiloglu, Ozturan, and Kutlu (2017) examined workers' attitudes in 500 corporations in Turkey towards e-learning for corporate training. Students were sampled and administered a questionnaire. Kimiloglu et al. reported that the firms in the firms had hesitant attitudes towards e-learning for corporate learning. Additionally, the study reported that the advantages of e-learning in corporate training were as follows: convenience and accessibility, employee commitment and motivation, customization and outsourcing, and cost-effectiveness, while the disadvantages have been grouped as personal and organizational factors.

Khasawneh (2015) investigated the development of the e-learning process by adopting ICT usage among the Jordanian universities' academic staff. The study focused on the determinants of ICT usage in public universities among the academic staff. The

Decomposed Theory of Planned Behaviour (DTPB) was used to underpin the study. The study reported that variables such as self-efficacy (SE) and facilitating condition (FC) have positively related to Behavioural Intention (BI) when academic staff adopts ICT usage in the higher educational systems. Additionally, a significant relationship existed between academic staff's perception of technology characteristics and their Perceived Behavioural Control (PBC) as they adopt ICT devices for teaching.

Benninck (2004) assessed the benefits and challenges of e-learning in corporate organizations and reported that employees lacked computer skills, feared technology, development, and maintenance cost issues. Others include educational problems, technical problems such as broadband width, internet problems, and technology incompatibility. A follow-up study was done by Gudanescu (2010) in different educational settings and reported similar findings. For the advantages, both studies (Benninck, 2004; Gudanescu, 2010) reported that using ICT devices for learning brings some flexibility in the learning process, and there is consistency in training and delivery.

Hamari et al. (2015) examined how game-based learning on electronic media influenced student engagement and immersion. The study adopted an experimental approach by introducing electronic games to 134 high school students. The results showed that there was a relationship between challenge and perceived learning as well as between skill development and engagement. This implied that the use of gamification impacted learning attitudes positively.

Some studies on ICT, e-learning, and distance education in Ghana, Africa, and beyond have reported insightful findings. For instance, Edumadze et al. (2017) assessed e-learning on the University of Cape Coast distance education students and reported that most students have basic computing skills. However, the students have little or no experience with search engines, which helps them to learn. The study also concludes that although 92.5% of the students have internet access, 53.6% have the requisite skills to surf the internet. The study makes final remarks that many students are prepared to pay extra charges to enjoy e-learning activities.

Ohene and Essuman (2014) examined challenges faced by distance education students of the University of Education, Winneba, with a sample size of 156. The study's findings show that institutional, instructional, social, psychological, and financial account for the distance learning centers' challenges. Concerning the finances, full fees are required before students are registered, and a lack of counseling centers accounts for students' poor motivation.

In a related study, Badu-Nyarko and Amponsah (2016) assessed the challenges in distance education at the University of Ghana. They reported that students have issues with registration and inadequate lecture periods. Besides, facilitators had other challenges such as inadequate training, low financial motivation, late attendance of students, late delivery of modules to students, and overloaded modules to be treated in a semester.

2.6.2 Factors constraining access to Information Communication Technologies in facilitating distance learning

Many countries in the developing world are fraught with problems and limitations. Shafiqul (2019) identified some problems related to ICT-based education. The identified issues are technical and ethical, affordability, technological imperialism, socialization and humanization of technology, appropriateness, and acceptability. The opportunities provided by ICT-based education may not benefit all learners in countries with different socioeconomic, political, and cultural environments. Acquiring knowledge through technology may cause serious maladjustment for people in many developing countries. The cost of establishing and maintaining the program economically, culturally, socially, or politically must be affordable as a global education system. He further suggested that any substitution or reform of technology use in developing countries requires social, cultural, and economic coordination. According to him, each technology has its advantages and disadvantages. In a specific region and culture, one medium may have better teaching functions than another, and learners may have different preferences for the best learning techniques.

A person's socioeconomic and cultural background will affect their ability to learn different media technologies. The use of new communication technologies requires well-trained personnel to design, develop, produce, and deliver teaching materials. Few developing countries provide adequate human resource training for these specialized tasks.

Soh et al. (2007) pointed out that the ICT landscape is changing rapidly, which means that scholars are often under pressure to update courses and teaching materials. With the continuous update of degree programs, it is difficult for potential students and career

consultants to keep up with these changes. The general challenge of acquiring and using information and communication technology inconvenient teaching in developing countries is rooted in unstable electricity supply, poor infrastructure, unskilled technical staff, network problems, and hardware and software acquisition. Other reasons are the low level of computer knowledge, limited legal regulations, and insufficient policies (Marrett, 2009).

According to the "Balance Law" (2005), ICT can solve the major challenges facing distance learning, and the acquisition of ICT remains a huge obstacle. Even though internet access and mobile phone use have been increasing rapidly in recent years, they remain remote from their reality for very many poor people. Behind the enthusiasm of reviews of growing internet and telecommunications connectivity in the developing world and despite ICT-dedicated programs and projects, most illiterate people have no prospect of learning through these means. Access, particularly to the internet, remains an elite luxury in much of the world, and ICT infrastructure the plaything of the rich.

2.6.3 Distance education research outcome pattern

Distance education research works of literature have revealed some basic patterns of findings. All the numerous studies have the following key concepts in focus; achievement/outcomes, attitudes/opinions (e.g., level of satisfaction, etc.), and accessibility/barriers (both to course participation and completion and delivery type).

I. Achievement/outcomes

As may be expected, a huge amount of research has gone into various aspects of distance education regarding student achievement and outcomes. A useful starting point for a brief review is to look at results from meta-analyses. Such studies indicate little

difference in achievement between traditional face-to-face and distance learning. Jowsey et al. (2020) suggest that when blended learning is delivered purposefully and effectively in managing and supporting active student learning, it positively influences students' achievements.

Sadeghi (2019) opined that distance learners seek online interaction and accept this interaction as part of their learning. This opportunity can be used to help them learn easily and more effectively. Kotoua et al. (2015). With online education, the working class can get better degrees for promotions or better salaries.

Dubin and Hedley's (1969) review of studies also found no significant difference between television and face-to-face instruction. Later meta-studies also tended to conclude that there was little difference (e.g., Cohen et al., 1981; Moore et al., 1990), although the latter cautioned that much of the published literature was either anecdotal or employed weak research designs. However, even the latest meta-studies (Machtmes and Asher, 2000) show little difference in distance and traditional learners' achievement. A study by Munyoka (2014) showed that the use of the tele-education system in open distance learning has positively increased the students' depth and satisfaction of learning, Navarro and Shoemaker (2000) contended that much distance education literature is based on "older" learning technologies, such as television. By contrast, they say, there are few studies that "rigorously compare distance learning in the newer, multimedia cyber-learning format with traditional learning" (Navarro and Shoemaker, 2000). They attempted to rectify this with a study that looked at both performance and perception of traditional versus "cyber learners." The latter were provided with lectures on CD-ROM, together with online quizzes, an electronic bulletin board (asynchronous communication), a "discussion room" (synchronous chat), and e-

mail access to the course tutor. The traditional group was provided with face-to-face lectures, discussions, and a standard textbook. The performance of the two groups was rated by comparison of final exam scores and attitudinal measures. Results showed that cyber learners performed significantly better by gender, ethnicity, or class level than the traditional group.

II. Attitudes/opinions (e.g., level of satisfaction)

Again, a good starting point here is to look at meta-analyses. Allen et al. (2002) looked at studies comparing student satisfaction with distance education to traditional higher education classrooms. Results indicate that: "students indicate a slightly higher level of satisfaction with live course setting than distance education formats" (Allen et al., 2002). The effects of communication channels were examined, which showed a preference for the video to written formats. The writers pointed out that this is consistent with the hypothesis that greater information, including the ability to see the instructor, is preferred over more limited channels. The interaction was also examined. Not surprisingly, "full interactive audio/visual demonstrated the largest effect" (Allen et al., 2002).

In sum, the authors conclude that students compare distance education favorably to other educational formats. Navarro and Shoemaker's (2000) "cyber-learners" versus face-to-face student study have been outlined above about student performance. The authors also looked at student attitudes about the course presentation. For this, an attitudinal survey was undertaken. One part of this concerning workload, reasons for taking the course, quality, etc., was given to all students. A second part, however, was given to the cyber-learning group only. This focused on the evaluation of the

technologies involved (CD-ROM, online bulletin board, etc.) Results showed that a desire to learn at one's own pace (28 percent) and not attending lectures (20 percent) were significant factors. Of those who chose the traditional course delivery mode, 49 percent indicated that they felt more comfortable in the familiar environment, 20 percent felt they would not learn as much online, and 15 percent were not aware that they had had the choice of options. Much distance education research into perceptions, attitudes, etc., does not compare distance to face-to-face courses or look at the interplay between online and offline environments but instead examines the distance environment in itself.

One such study is undertaken by Daugherty and Funke (2017). The researchers surveyed staff and students involved in a web-based Master's degree course in education, using search engines to find information and access many given health-related web sites. The course was well-received, with the most cited benefit being the vast information store housed on the web. Interestingly, however, the technology-related knowledge, rather than subject-related, rated most highly (i.e., learning to navigate the web, using browsers, etc.). Apart from some problems, such as perceived lack of staff support and some student resistance, overall, the course was considered a great success.

These positive findings were not mirrored by a study carried out by one of the present authors (Williams, 2001, 2002). Undergraduate psychology students were required to use web-CT for course notes, learning exercises, and online discussions. In-depth interviews with both students and lecturers showed that the two groups differed markedly in their perception and evaluation of the system. Many of the advantages trumpeted by the former were dismissed by learners, who felt that online material gave

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them extra work, represented an abrogation of academics' teaching duties (i.e. by simply posting reading materials online without explaining it) and shifted printing costs from the institution to the student. The study concluded that more attention needs to be paid to user needs, from their perspectives, user attitudes towards information provision, and then tailoring material to take these factors into account.

Unlike the studies outlined above, Thurmond et al. (2012) attempted to evaluate student satisfaction with a web-based distance education course while controlling student characteristics. The authors argue that although previous work has examined student satisfaction with web-based distance learning (e.g., Billings et al., 2001), it is difficult to link student perceptions with purely environmental variables. In other words, it may be that, as the authors put it, "students were more satisfied with web-based courses because of their computer skills or high level of knowledge regarding course content rather than as a result of . . . the web-based course" (Billings et al., 2001). Results indicated that student characteristics did not influence reported levels of satisfaction.

III. Accessibility/barriers

The segregation between the student and the instructor can be accessed using electronic or printed media. Addy and Boateng (2015) said for ICT projects to be feasible in Ghana's universities, they have to be adjusted to the local conditions and appropriate technology to achieve project improvement (Assar et al., 2010). Thus ICT success in the universities will depend on the appropriate design of software and hardware relating to the requirements of the universities. The lack of technology ownership is the cause of ICT project failure in universities in Africa (Brunello, 2010). Also, the lack of the right ICT products which are not designed to meet the needs of the university students

and lecturers can become a challenge to access ICT related products (Lam, 2010). Commenting on Brunello and Lam's findings, it is observed that most institutions running distance programs heavily rely on external technologies such as educational apps. In these technological devices, few have their accessible portals.

Furthermore, the lack of adaptation of ICT resources for SEN learners in Ghanaian universities is the reason for their absence from the ICT revolution. There is a need for ICT to be adjusted to meet their emotional and social development, cognition and learning, behavioral sensory, communication, and interaction.

Another challenge for ICT development in universities in Ghana is the problem of infrastructural development. Infrastructural development is the key for university students and lecturers in developing countries to close the digital divide with those of the developing world [Mikre, 2011]. The high cost of setting up ICT in the universities in Ghana, including the acquisition of hardware and software, the setting up of telecom networks, and the maintenance of repair infrastructure, is impossible for the government of developing countries [Assar 2010]. Looking backward to Powell et al. (1990), they classified the factors contributing to success and retention in distance education into three general categories. These are:

1. Predisposing characteristics: including prior education, socio-economic and demographic status, and motivational and other personal attributes.

2. Life changes include personal illness, relocation, altered employment status, and family problems.

3. Institutional: including quality and difficulty of instructional materials, access to and quality of tutorial support, and the administrative and other support service provided.

In their study of drop-outs from a Hellenic Open University course in education studies, Vergidis and Panagiotakopoulos (2002) found that the main problems stemmed from family or work obligations, rather than from factors intrinsic to the course of its delivery. It has long been known that such external factors were extremely important. Knox's (1977) developmental-stage orientation of adult life stresses the importance of understanding the context within which a person carries out their everyday activities, i.e., their family, work, health, condition, personality, etc. These all affect adults' ability and willingness to participate in adult education. No single factor appears to cause non-participation; however, individual student characteristics and life circumstances appear to have the greatest impact on participation (Kerka, 1986). Other studies all indicate that demographic variables were less predictive of completing an educational program than attitude and the degree of social support.

Some work has been carried out concerning barriers that prevent full participation in online courses, even for students who complete them. For example, Howard (2002) identified several barriers concerning online interaction, the main one of which was an "insurmountable social-psychological barrier." Technical problems were also blamed for lack of interaction, often of poor quality and difficulties in manipulating cameras and microphones. Howard also noted a certain degree of alienation, brought about by the lack of physical presence and the reluctance to use the technology.

2.7 Conceptual Studies

This part of the study conceptualized the way ideas are organized based on UEW DE to achieve the research objectives. This section consists of the research study area, UEW distance system, integration of the UTAUT model, and proposed research framework.

2.7.1 Research Area

University of Education Winneba (UEW) is a renowned public university in Ghana missioned to train competent professional teachers for all education levels and conduct research, disseminate knowledge and contribute to educational policy and development. The university is also charged with producing professional educators to spearhead a new national vision of education to redirect Ghana's efforts along the path of rapid economic and social development. The university has four major campuses, with the main administrative campus located in Winneba, Central Region of Ghana, while the three others could be found in Kumasi, Ajumako, and Mampong. The university was established in 1992 by a government ordinance (PNDC Law 322) and a relationship with the University of Cape Coast. In 2004 the University of Education Act, Act 672, was enacted to upgrade the University College of Education of Winneba to the status of a full University. Currently, the university has 14 faculties, 2 institutes, and about 59 academic departments across all its campuses. The students' population is over 60000. The university has many facilities for running its programs such as the library, hostels, classroom and office buildings, teachers' bungalows, study rooms, food, quality roads, an aesthetic environment with well-trimmed ornamental plants, and others. UEW has a fiber-optic network with a LAN and wireless access installed throughout all campuses with computer labs for students in terms of the internet infrastructure. The university-run hundreds of certificates, diplomas, degrees, and postgraduate programs in all aspects of education.

2.7.2 Integrating ICT in UEW distance education based on the UTAUT model

The theoretical foundation of distance education or website learning in UEW conforms with theoretical models. The implementation of technology in distance education, especially in higher education, results from extensive research outcomes. One most

used technology theory to support this study is the extended Unified Theory of Acceptance and Use of Technology (UTAUT). Venkatesh et al. (2003) formulated and validated the Unified Theory of Acceptance and Use of Technology (UTAUT, hereafter) from integrating elements of eight prominent models after empirical comparisons between them. These models are; The Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behaviour (TPB), a combined TBP/TAM, the Model of PC Utilization, Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). The unified model brings together alternative views on user and innovation acceptance. The UTAUT suggests that four core constructs (performance expectancy, effort expectancy, social influence, perceived cost, and facilitating conditions) are direct determinants of behavioral intention and ultimately behavior and that these constructs are in turn moderated by gender, age, experience, and voluntariness of use (Venkatesh et al., 2003).

However, this study explores the independent variables only and will not examine the relationship between students' attitudes. This is because research into UEW distance education is few, and also, the university has not extremely or fully implemented distance learning mode compared to schools in developed countries. Therefore, it is possible to overlook the statistical significance of the UTAUT independent variables, and its relationship to students' behavior may not be accurately predicted. UEW's attempts to adopt technology-based learning started long ago where students could access their course registration online, examination results, and download learning modules. Rigorous practices have been met with serious challenges, such as infrastructure and internet connectivity. Moreover, the importance of technology-based

learning practices has been discussed by many researchers. For example; According to Abrahão et al. (2016), ICT-based models provided an important managerial tool for evaluating and constructing strategies for introducing new technologies. Oye et al. (2014) show the relevance of UTAUT in anticipating the acceptance and use of ICT by staff and students of a university in Nigeria. The studied case shows the intention to use easy-to-use technology and promote better professional performance. The results emphasize that expectations of effort and social impact are the main predictors, and time and technical support are the main obstacles to the acceptance and use of technology. In another work, Martins et al. (2014) developed a conceptual model that combines the Unified Theory of Acceptance and Use of Technology (UTAUT) with perceived risk to explain behavioral intentions. The survey was conducted on a student and a former student of a Portuguese university and concluded: in the expected use intention, performance expectations, effort expectations, social influence, and the importance of risk factors.

Prior research of user acceptance and technology adoption was reviewed to recognize the significant variables that might influence e-learning systems uptake, especially in higher education. UTAUT is a theory that was established to study how people accept technology. Although the original Technology Acceptance Model (TAM) is claimed to be the most influential and frequently cited theory in the literature, it is believed to predict technology acceptance success in between 30% and 40% of the cases, which indicates a limited explanatory power and a lack of usefulness in the acceptance research field (Chuttur, 2009; Teo, 2011). In a significant study of students' acceptance of web-based learning technology, TAM was found to explain only 15% of actual student use, placing another constraint on the model validity and reliability (Martins &

Kellermanns, 2004). Therefore, applying UTAUT to explore the impact of integrating ICT in distance education is a projecting step for users to wholly accept and adapt to the new normal.

2.7.3 UEW learning Management System (LMS)

The application of the UTAUT in UEW distance learning will focus on the learning management system (LMS, hereafter). UEW uses the learning management system to conduct its online learning. According to Sharma and Vatta (2013), "LMS is a server-based or cloud-based software program that contains information about users, courses, and content, thus providing a place for learning and teaching without relying on time and space limits." Also, Ellis (2009) explained that these systems can provide remedial measures, a challenge for sub-Saharan Africa (SSA) institutions to avoid soaring enrollment rates.

 The distance education department operates out of the Institute for Educational Development and Extension (IEDE), currently known as Institute for Distance and e-Learning (IDeL). It also operates one of the largest distance education. The study centers for distance education are grouped into the southern center and northern center, with over 40 learning centers across Ghana. The system allows users or students to register with their student index number and modify their password later. The LMS platform enables the students to enroll in a subject and attend tutorials as specified in their time table. Course books can be accessed, importance notice is displayed in the form of news, and there are many video tutorials for first-time users.

Using the LMS platform, instructors organized lectures, give learners assignments, quizzes, and assignments, which can be done either on take-home or instantly online. This system is new and unfamiliar to most students as against the normal face-to-face classroom experience. To make an accurate conclusion on ICT integration in distance learning, the researcher preferred to use UTAUT as a theoretical foundation to explore learners' or stakeholders' acceptance and challenges. The Covid-19 epidemic has championed the adoption and intensive implementation of LMS usage in distance education. Notwithstanding, research on LMS has emerged and contributes significantly to the literature. For instance, Alshehri (2019) asserted that technological innovation advances had revolutionized teaching delivery in educational sectors and corporate settings. Educational trends have been changing rapidly to adopt web-based learning, especially in educational settings. Watson & Watson (2007) opined that LMS embodies many services such as the placement of course materials online, online communication, and collaboration between students-students, students-instructors and instructors-instructors, and student monitoring participation and assessing students' performance.

2.7.4 Proposed conceptual framework

Based on the literature review and personal observation in university, the author proposed this concept to explore ICT integration among distance learners. The framework comprises five components; distance learners, lecturers, environmental supports, administrative support, and ICT. From the concept diagram, ICT plays an active role, and it coordinates all dimensions to promote effective distance education.
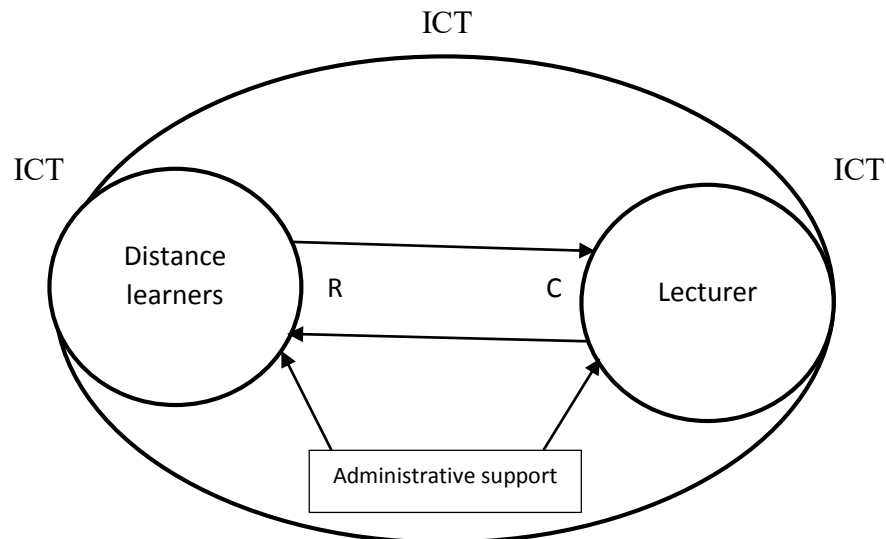
Figure 2: Proposed ICT distance education integration model

With this study, this model (figure 2) was conceptualized for its importance in pointing out the integration of ICT in the distance education process. ICT forms a larger universe within which many information elements are at play. In our case, there are communicators and receivers of information, thus lecturers and students respectively. The information system is a two-way flow from either side. The lecturers or tutors as communicators form a sub-universe, and the distance learners in the students' sub-universe as receivers of information. There is an administrative and external environment which plays crucial services in all aspects. This conceptual framework is based on the specific objectives to examine the availability, use of ICTs, and factors influencing the general application of ICTs at UEW. This shows the relationship and interaction between students and lecturers of educational universities using ICT facilities to provide information, administrative support and environmental factors.

To date, little research has been conducted on ICT's role in promoting distance learning in academic institutions. Mwakilama and Nawe (2005) concluded in their research that the provision of information services, ICT facilities, information retrieval tools, and

changes in librarians' role have all raised new requirements and challenges. Also, networked computers have been used for Internet access and word processing. Mushi (2006) pointed out that ICT should be highly adopted as an ideal technology in the contemporary ODL practice world.

Table 3: Explanation of the constructs in the model

ICT provisions	Explanation
Distance students	The distance learners comprise students who learn at home or weekends only and have few hours to meet the lecturers face to face. To a large extent, most of the academic interactions are online, especially in this Covid-19 era. The distance students need in terms of ICT
Lecturers/ tutors	From the lecturers' point, they are the instructors, supervisors, examiners, and regulators of all distance learning processes, either virtually or printed media interaction.
Administrative support	Administrative supports are the supervisors behind the distance learning and ICT/LMS usage study.

Source: Researcher's preliminary investigation

Table 4: LMS usage constructs using UTAUT as the theoretical foundation for measurement

LMS usage constructs	Measurement variables
Performance Expectancy: This measures how much people realize that a system such as the Internet or mobile technology is useful in carrying out their tasks in day-to-day work (adapted from Venkatesh et al., 2003)	Improved achievement, Motivation to learn, Compatibility in learning Improved way of learning, Learning outcomes
Effort expectancy: This explains the degree of ease associated with the use of the system. It originates from three constructs of existing models: perceived ease-of-use (TAM/TAM2), complexity (MPCU), and ease of use (IDT) (adapted from Venkatesh et al., 2003)	The effort required, Complexity, Ease of learning
Social influence: This is defined as the degree of influence that others' opinions can have on adopting a given system. Social influence as a direct determinant of the intention of use is represented as a subjective standard TRA, TAM2, TPB/DTPB, and C-TAM-TPB; social factors in MPCU and image in IDT (adapted from Venkatesh et al., 2003)	The necessity of using ICT media, Habit or culture, Social status
Facilitating Condition: this refers to own individual capabilities, competencies to easily adapt to technology.	Self-efficacy, Condition of resources, Experience
Perceived cost: This refers to the initial subscription, transaction, and communication costs to which the consumer believes they will be submitted in the future. It also includes the consumer's ability to buy a mobile device compatible with the mobile payment service (adapted from Shafinah et al., 2013).	Internet cost, subscription or communications cost, time cost Computer and phone cost

Source: Adapted from UTAUT theory

CHAPTER THREE

RESEARCH METHODOLOGY

This section describes the procedure for data collection. It covers how data were prepared or designed, selecting the respondents, data source, piloting of the research questions, data analysis plan, validity, and reliability of the questionnaire instrument.

3.1 Research Design

A study design is the general plan of research. It is the blueprint for collecting, measuring, and analyzing data to solve the research problem. It ensures that data is validly collected by objective and economical procedures Tripathi, (2002). This study used exploratory research to investigate ICT integration in distance learning education in UEW. This research explores the university's learning management system (LMS), especially in the Covid-19 era. The author chose this type of design to provide more insight into distance learning. It has become very necessary for most schools, colleges, and universities to accept the new normal of learning because of the Covid-19 pandemic in the world.

Exploratory research is defined as research used to investigate a problem that is not clearly defined. It is conducted to have a better understanding of the existing problem but will not provide conclusive results. Exploratory research focuses on gaining insight and familiarity with further research. For such research, a researcher starts with a general idea and uses this research as a medium to identify issues, which can be the focus for future research. An important aspect here is that the researcher should be willing to change his/her direction subject to the revelation of new data or insight. Researchers have identified the following advantages of exploratory research;

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➢ The researcher has a lot of flexibility and can adapt to changes as the research progresses.

➢ It is usually a low cost.

➢ It helps lay the foundation of research, which can lead to further research.

➢ It enables researchers to understand early whether the topic is worth investing time and resources and whether it is worth pursuing.

➢ It can help other researchers find out the possible causes of the problem and further study in detail to determine the most likely cause of the problem.

3.2 Study Population

According to Agyedu et al. (2007), population refers to the complete set of individual (subjects), objects, or events having common observable characteristics in which the researcher is interested in studying'. The population, therefore, referred to a selected group of people set aside for a specific purpose. Malhotra (2011) explains the research population as collecting elements or objects that possess the researcher's information and about which inferences are to be made. The research population refers to the group from which the researcher wants the study results to be generalized. In this study, the target population comprises students of the Institute for Distance and e-Learning (IDeL), lecturers or tutors, management, and administrative staff of the information technology (IT) support department of UEW. The university's total population is 85004 as of the 2019/2020 academic year, the total population of the study.

3.3 Sample Size

A sample is a subset of the population of the study. Scholars such as Osborne and Costello (2009) and Field (2009) postulate that the sample size needs to be big to conduct a reliable factor analysis. Sampling is the process of selecting many individuals for a study so that the individuals symbolize the larger group from which they were selected. In all, 120 participants were involved in the study. This includes 100 students at various completion levels and 20 administrators and tutors or lecturers from the distance department.

3.4 Sampling Technique

The sample for the study was selected by using stratified random sampling. According to Teddie Charles and Fen Yu (2007), stratified sampling is when a researcher is interested in drawing a random sample. He or she needs the sample to be a characteristic of the population on some representative of interest. The situation becomes more complicated when the researcher wants various subgroups in the sample to also be representative. In such cases, the researcher uses stratified random sampling, which combines stratified sampling with random sampling. In this situation, the researcher divided the target population into homogenous groups, thus (1) Institute for Distance and e-Learning (IDeL) formally IEDE, (2) lecturers or tutors, (3) management and staff of information technology (IT) department. Each group contains similar characteristics, and they are all involved in the UEW learning management system (LMS). In the above three main strata, the simple random technique was used to select the study's expected participants. Every unit in a stratum has the same chance of responding to the questionnaire. Using the same sampling fraction for all strata ensures proportionate representation in the sample. This sampling technique gives a fair representation of all units within the target population.

Table 5: Sample Size

Target group	Sample size
Institute for Distance and e-Learning	100
lecturers or tutors	10
IT staff and management	10
Total	**120**

Source: Researcher's own selection, 2020

3.5 Data Source

Identification of the data type required was the first step in the data collection process. Corbin and Strauss (2008) support this assertion and cautioned that failure to define appropriate data might lead to inadequate results. Generally, there are two accepted types of data: primary and secondary data (Ghauri & Gronhaug, 2005). Data obtained by a researcher for addressing the present research is what Malhotra et al. (2007) normally call primary data. For this current research, the author will depend on primary data for research analysis. The empirical analysis of ICT integration in UEW will be investigated with first-hand information. Secondly, in the literature review, secondary data and literature search from credible databases and journals such as IEE, Scopus, ScienceDirect/Elsevier, Springer, Google scholar, research gate, Sci-hub, ACM (Association for Computing Machinery) Digital Library, Wiley Online Library, AMA and Sage Pub. Etc. were used.

3.6 Data Collection Instrument (Questionnaire)

In Malhotra and Briks (2007) opinion, four (4) instruments can gather primary data. There are so many strategies to collect information from people in social science studies. It could be interviews, observations, questionnaires, and others. Due to the

nature of the research design and this study's focus, questionnaires are used as the main data collection instrument.

3.6.1 Questionnaire

A questionnaire is an instrument that shows different kinds of questions or statements known as items that are carefully planned and drafted to solicit responses. Questionnaires are the most frequently used method of data collection in social science studies. They are relatively easy to use, inexpensive, and are often the most plausible alternative for measuring unobservable constructs such as attitudes, values and preferences, intentions, and personalities (Moorman & Podsakoff, 1992). For this study, closed-ended questionnaires were used to collect information from the respondents. Two separate questionnaires were designed; one for students (Q1, hereafter) and another for lecturers or tutors and administrators (Q2, hereafter).

(i)   Questionnaire for students (Q1)

The Q1 questionnaire consists of five main sections. The introduction part of the research questionnaire is designed so that the purpose of the research was spelled out to respondents, together with assurances of confidentiality. The questionnaire captured the respondents' demographics, thus, gender, age, and respondents' level in section A. The background mentioned above information was significant for the researcher, and other non-contexts biodata were ignored. *Section B* describes the most frequent ICT tools used in distance education. The items were categorized into; ICT devices, e-resources, writing and editing tools, media learning tools, online study media, messenger, and presentation tools. There are twenty-eight question items in this section. The measurable scale used in this section is *"always, sometimes, and never."* Section

C shows the role of ICT tools in distance education. There are ten question items with 5 Likert Scale measures ranging from strongly agree to strongly disagree.

Section D illustrates the challenges in ICT or LMS integration distance education. The challenges were categorized into barriers, achievement, and attitudes with 6, 4, and 5 question items. The last section, E, allows respondents to indicate their experience on UEW LMS. The question items were constructed based on the Unified Theory of Acceptance and Use of Technology theory. The author aimed to validate and explore the independent variables of the theory for further studies. The adapted UTAUT theory's independent variables are *performance expectancy, effort expectancy, social influence, perceived cost, and facilitating conditions*. Section C, D and E were measured using the 5 Likert scale where Strongly Agree (SA) = 5, Agree (A) =4, Neutral (N) = 3, Disagree (D) = 2 Strongly Disagree (SD) = 1.

(ii)   Questionnaire for lecturers or tutors and administrators (Q2)

The second questionnaire sought to seek respondents' ideas and experience and suggestions on ICT integration in UEW distance education. It has only two sections. Section A briefly requires participants to specify their gender, educational qualification, and positions. Only these items have a significant relationship with the study, and therefore, age etc, were not included. In section *B,* the respondents are to tick how their experience on ICT usage, its contributions, and success so far and lastly suggest ways to improve ICT and LMS application in UEW.

3.7 Data Collection Procedure

The Covid-19 pandemic poses a great threat to administer questionnaires personally or face-to-face. Given this, the author resorts to the use of online administration. Before the questions were administered online, the researcher conducted a pilot study using a convenient sampling method to select few available students to answer the questions. Secondly, the questionnaires are presented to expertise precisely by my supervisor for validation and screening. The comments of the supervisor, as well as the observations from the piloting are addressed. After this, the author used the "google forms" app to design the questionnaire. The particular app is used because of its flexibility and features. The app does not require a VPN, and it can be embedded and share on Whatsapp platforms. Since almost all the target populations are on this platform, the researcher feels great pleasure to engage in personal interaction and assist respondents if any difficulty occurs. The questionnaire administration is expected to take five weeks to get the desired number of responses. The link to the online survey is https://forms.gle/PRfXEzN3A3PChY8N9.

3.8 Data Analysis Plan

After obtaining the data, firstly, the researcher screened to eliminate the uncompleted questionnaire and spoil the paper. With the help of SPSS, the questions were be coded for efficient analysis and interpretation. Cronbach's alpha was used to test the reliability statistics of the data. Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) is the model to test the data's sample adequacy and validity. Again, Independent T-test analysis from the perspective of the categorical respondents were reviewed. To know the quality and significance of the question items, the Varimax rotation method will validate the questionnaires since the author uses a self-developed questionnaire in this

exploration study. Lastly, descriptive statistics of the respondents' views were presented and discuss accordingly.

3.9 Ethical Considerations

Ethical issues are significant in the research process. Failure to recognize ethical conduct can pose a great limitation to the research findings. According to Babbie and Mouton (2016), ethical standards require that researchers not put participants in a situation where they might be at risk of harm due to their participation. Involvement in any research project must be undertaken on a completely voluntary basis. 'Voluntary' means that the participant freely, without threat or inducement, agrees to be involved in the research project (Sieber, 1992).

To adhere to research ethics, the researcher informed participants and explained clearly the goals of the research. The author explained why their department is being selected, the outcome and worthiness of the study to their department, and assurance to keep their identity and responses from the external or public domain. Again, the participants answered the questionnaire voluntarily without any intimidation.

CHAPTER FOUR
RESULTS OF THE STUDY

The study explores the impact of integrating ICT in distance learning education at the University of Education, Winneba. It considers LMS usage and user intention using UTAUT theory as a basis. The results are presented in the form of well-labeled tables and figures under the research questions.

4.1 Respondents' Background Information

The background information of the participants collected were gender, age, and educational background. The information provided enough insight into the research to understand the respondents well. The background also added credibility to the study participants, as described in the methodology section.

4.1.1 Gender of respondent

Figure 3 indicates the gender of the respondents. 62.5% of the respondents are male, whereas 37.5% represent female. This means more males participated in the study than the females.
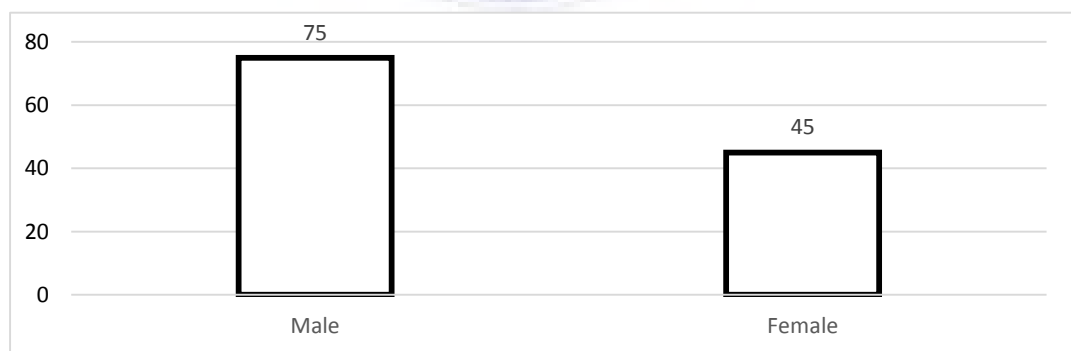
Figure 3: Gender of the respondent

4.1.2 Age of respondents

Age is a significant factor in university admissions. Most colleges place an age restriction on access to specific programs such as the undergraduate, postgraduate, and entry-level requirements in the distance education mode. This study age data shows that 2 of the respondents are below 20 years. The highest age range was 48.3% of the total participants.49 of the respondents are within 31-40 years, representing 40.8%. Lastly, 11 of the respondents are from 41 to 50 years.
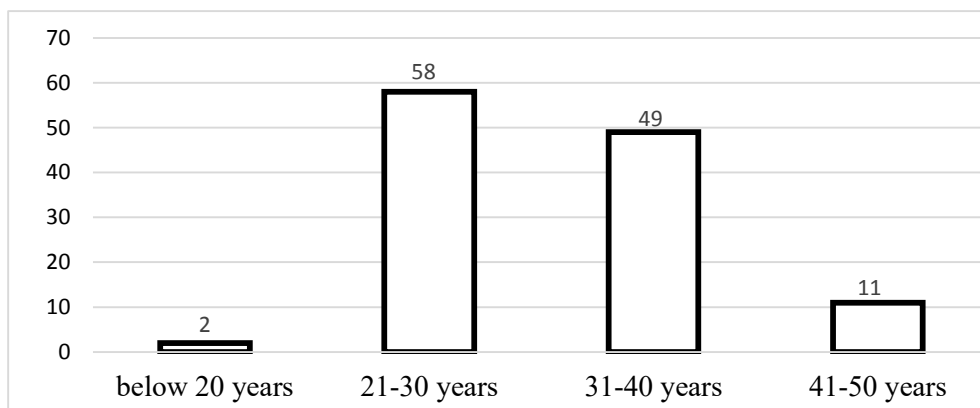
Figure 4: Age of respondents

4.1.3 Respondents educational background

The respondents' educational background reveals that 53.3% are degree holders, 11 respondents have a diploma, and 35.8% have a postgraduate degree.
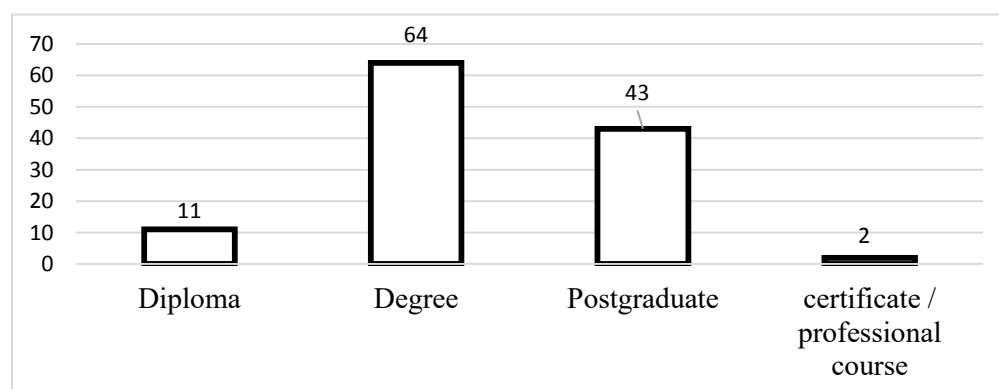
Figure 5: Educational level

4.2 Research Question One: "What ICT tools are used in Distance Learning?"

The addition of ICT into distance education has become vital in today's modern world, coupled with Covid-19 impact on the traditional classroom setting. This has re-engineered scholars to examine ICT's critical role in education, especially distance learning systems in Ghana. First, the literature reveals from international and foreign articles ICT tools commonly used in distance learning education. For the findings, the researcher categorized these tools based on their usage in education. This will help in integrating similar ICT devices into UEW distance learning mode. The results of the findings are tabularized in this sub-section. Moreover, the researcher ignored the outliers of the responses and opted for an accurate central tendency measure. Because of that, the mean statistics are used. The arithmetic mean, or average, shortened to mean, is the most popular and useful central location measure. It is computed by simply adding up all the observations and dividing by the total number of observations. It should be noted that the measurable scale used is *"always=1 sometimes=2, and never=3.* Therefore, mean statistics closer to 1 are considered truly always, 2 is sometimes, and closer to 3 is never.

4.2.1 ICT devices

From table 6, the mean statistics of computer or laptop usage was 1.39. This indicates that it is mostly always used in distance education. Also, smartphones such as Samsung, iPhone, infinix, Techno, etc., are the most used in this category.

Table 6: ICT devices

Description	Mean	Std. Deviation	Variance
computer or laptop	1.3917	.56947	.324
smartphones (Samsung, iPhone, infinix, Techno Samsung, iPhone)	1.2750	.51795	.268
Peripheral device (speaker, USB drive, SD card, etc.)	1.4000	.58554	.343
Radio, TV, cassette, projectors, mode	1.6500	.68169	.465

Source: Field survey, 2020

4.2.2 E-learning resources

Table 7 presents the e-learning resources used in distance education at UEW. It was found that the respondents mostly use blogs/vlogs, search engines (Google, Yahoo, Wikipedia, Bing, google scholar) in their distance education.

Table 7: E-learning resources

Items	Mean	Std. Deviation	Variance
E-library, databases or e- journals, e-books	1.6333	.57880	.335
Blogs/vlogs, search engines (google, yahoo, Wikipedia, bing, google scholar)	1.2917	.47449	.225
Apps (oxford dictionary, translator, text editor, spell checker, grammar checker, etc.)	1.4622	.54911	.302

Source: Field survey, 2020

4.2.3 Writing and Media Learning Tools

Writing and media learning tools are the type of ICT devices that assist in distance education. Table 8 illustrates that WhatsApp (1.2583) is always used among learners in distance education as it is closer to 1. This could be evidence as students rely on

WhatsApp messenger group chat for official information. Microsoft office had a mean of 1.375.

Table 8: Writing and media learning tools

Description	Mean	Std. Deviation	Variance
Microsoft office (word, PowerPoint, excel	1.3750	.55097	.304
WhatsApp	1.2583	.52654	.277
Zoom	1.6333	.62083	.385
Skype	1.8167	.72162	.521

Source: Field survey, 2020

4.2.4 Learning Interaction tools

ICT plays a crucial role in distance interaction among students, learners, teachers, teachers, parents, and administrative bodies. Among the list of these ICT tools are exhibited in table 9 as LMS (1.74), which is sometimes used. SMS and WhatsApp messenger are always used, and Emails are officially used for communication in UEW.

Table 9: Learning-interaction tools

Description	Mean	Std. Deviation	Variance
UEW Learning Management System (LMS)	1.7417	.66731	.445
SMS messages/WhatsApp	1.5167	.53426	.285
Emails	1.4750	.51795	.268

Source: Field survey, 2020

4.2.5 Presentation tools

Presentation tools are used to present reports or assignments, make instructional delivery useful and exciting. The most presentation ICT tool uses Powerpoint, PDF, word, and excel document (1.49). This is followed by Projectors, radio & video recording, pictures, and TV, which is (1.52).

Table 10: Presentation tools

Description	Mean	Std. Deviation	Variance
Photo editor, text editor, video maker	1.5750	.68185	.465
Power point, PDF, word and excel document	1.4917	.59403	.353
Projectors, radio & video recording, pictures and TV	1.5167	.68824	.474

Source: Field survey, 2020

4.3 Research Question Two: "What are the roles of ICT in distance learning education in UEW?"

The roles of ICT in distance education have been widely studied. This study advanced to understand the perception of the functions of ICT in terms of gender perspective. Grouping ICT roles in gender reaction will help bridge the aspect of inequalities in distance learning. This is because more females feel frustrated and seek assistance from their counter males using some ICT tools in distance education.

Table 11: Role of ICT in distance education

Roles of ICT tools in distance learning		Gender	
		Male Frequency	Female Frequency
Access learning materials	Strongly disagree	6	1
	Disagree	2	4
	Neutral	0	0
	Agree	19	15
	Strongly agree	48	25
Information search	Strongly disagree	5	0
	Disagree	3	5
	Neutral	7	2
	Agree	22	17
	Strongly agree	38	21
Create a better learning atmosphere	Strongly disagree	2	3
	Disagree	7	4
	Neutral	3	3
	Agree	14	11
	Strongly agree	49	24
Easy download material	Strongly disagree	3	3
	Disagree	3	4
	Neutral	7	1
	Agree	18	19
	Strongly agree	44	18
Learn everywhere anytime	Strongly disagree	8	8
	Disagree	2	3
	Neutral	7	0
	Agree	8	9
	Strongly agree	50	25
Flexible and convenient to distance education	Strongly disagree	1	1
	Disagree	2	5
	Neutral	6	3
	Agree	14	10
	Strongly agree	52	26
Easy interact with classmates	Strongly disagree	7	6
	Disagree	1	2
	Neutral	2	2
	Agree	20	16
	Strongly agree	45	19
Save time	Strongly disagree	3	2
	Disagree	0	2
	Neutral	10	5
	Agree	15	13
	Strongly agree	47	23
Helps focus on learning	Strongly disagree	7	8
	Disagree	1	1
	Neutral	24	9
	Agree	26	17
	Strongly agree	17	10
Makes learning interesting	Strongly disagree	3	2
	Disagree	0	1
	Neutral	9	6
	Agree	24	17
	Strongly agree	39	19

Source: Field survey, 2020

The respondents examine the roles of ICT (Table 11) to indicate how it has helped them achieve their distance learning objectives. For instance, 73 (male 48+25 female) of the respondents strongly agreed to access learning materials. Thirty-four participants (19 males+ 15 females) agreed to the statement, whereas only six respondents disagreed. Interestingly, it could be deduced that the first item form a sequence for the rest of the statement items from the table. For instance, (information search, create better learning atmosphere, comfortable download material, learn everywhere anytime, flexible and convenient to distance education, easily interact with classmates, save time, helps focus on learning and makes learning enjoyable). In all these cases, the roles of ICT in distance education have been vigorously argued favorably. Thus the ICT tools or devices defined in table 6-10 play a meaningful contribution to distance education.

In a different outlook, the author scrutinized the roles of ICT based on gender (males and females) perspective. Does ICT integration in DE is felt unbalance? As seen in table 11, ICT's role in accessing learning materials according to males was 19, and 48 agreed and strongly agreed respectively. On the other hand, the females agreed and strongly agreed with 15 and 25 individually, which is lower than males. This pattern continues to be true for information search, create a better learning atmosphere, easy download material, learn everywhere anytime, flexible and convenient to distance education, easily interact with classmates, save time, helps focus on learning and make learning interesting. The table reveals a similar form where males than females largely felt ICT's roles in distance education.

4.4 Research Question Three: "What are the Challenges of Integrating ICT into Distance Learning?"

The addition of ICT or LMS in distance education has exhibited many challenges according to the respondents. These challenges were reviewed based on access barriers, achievement hindrances, and attitudes.

4.4.1 Accessibility challenges to LMS

The challenges were measured on five response scale where; Strongly Agree (SA) = 5, Agree (A) =4, Neutral (N) = 3, Disagree (D) = 2 Strongly Disagree (SD) = 1. Regarding the measurement scale and mean statistics from figure 4.4, the "my school do not provide orientation on online studies" value is 4.04, indicating agreed and strongly agreed. The second-highest challenge is "inadequate access to quality and modern mobile or computer devices," represented by 4.00. This is followed by "Network interruption affects my online studies," which is 3.68. "Slow internet speed" and "no online support when I encounter problems" accounted for 3.50 and 3.30 individually. And "location is not ideal to study online" accounted for 3.64 of the mean statistics which is largely neutral and agrees with response.
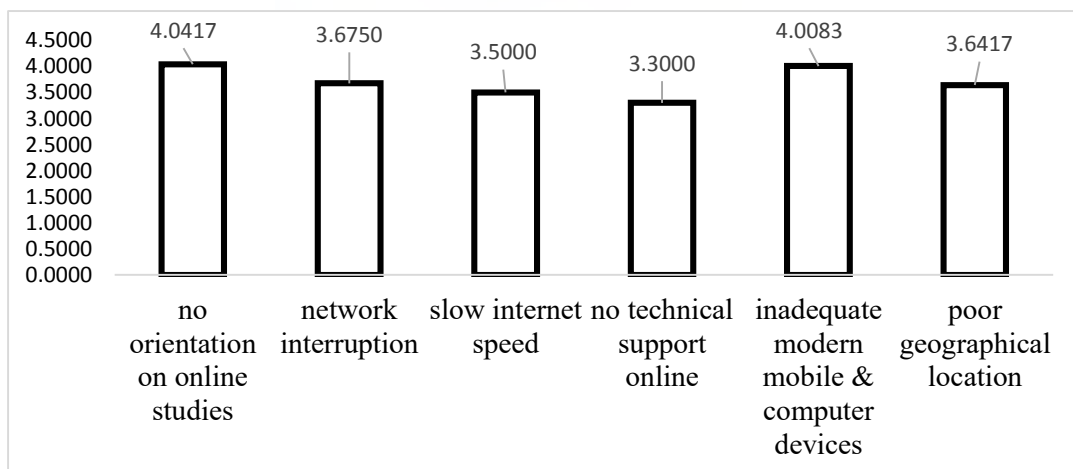
Figure 6: Challenges of ICT / LMS usage among distance education

4.4.2 Achievement or outcome challenges

In figure 7, the general satisfaction of the ICT tool in DE is the highest expressed outcome benefit, represented by 3.93. The statement is followed by the low level of interaction as compared to the traditional classroom setting. The statement "ICT results in poor examination performance was refuted. Moreover, "increasing understanding had mean statistics of 3.76, which is largely agreed on response.
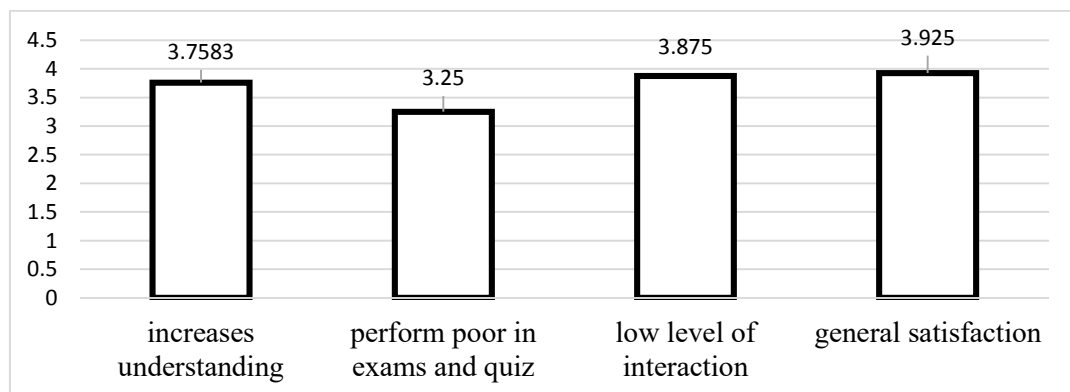
Figure 7: Achievement or outcome

4.4.3 Attitude Statistics

Section of the respondents expressed excitement toward online studies. This is indicated by the highest mean data (4.03), thus strongly agreed and agreed. However, it is noted that (3.67), the majority asserted that the LMS interface is not user-friendly. Equally, 3.34 of the respondents show low concentration.
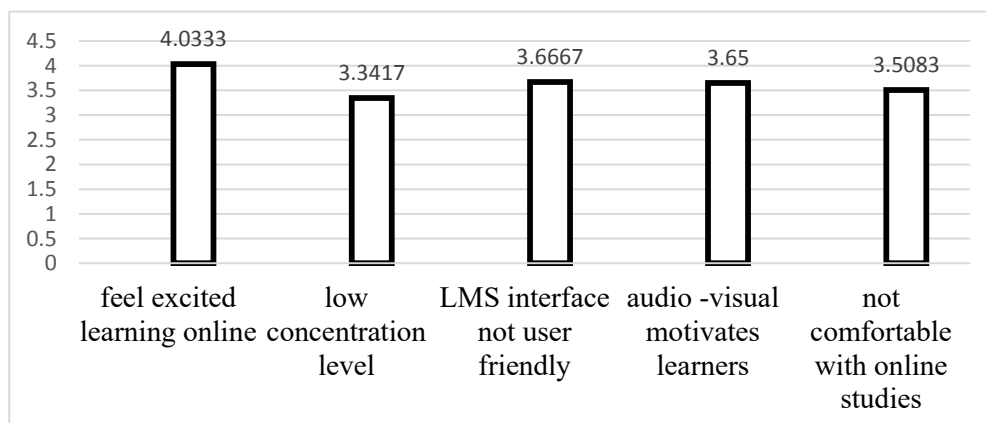
Figure 8: Attitude of students toward LMS studies

4.5 Research Question Four: "Based on UTAUT theory, what is the User Experience on UEW Learning Management System (LMS)?"

In the quest to find the answer to the question "how does a learning management system (LMS) influence distance learning students?" the research used UTAUT theory as a basis for measurement. According to the theoretical variables, the data were discussed underperformance expectancy, effort expectancy, social influence, facilitating conditions, and perceived cost as independent variables, whereas user behavioral intention is the dependent variable. The results of the analysis are presented in table 12.

Table 12: Matrix correlations among study variables

Variables	1	2	3	4	5
Performance expectancy	1				
Effort expectancy	.370**	1			
Perceived social influence	.439**	.447**	1		
Facilitating conditions	.057	.248**	.559**	1	
Perceived cost	-.049	.119	.247**	.265**	1
User intention	.137	.152*	.178*	.135	.038

Source: Field survey, 2020; N = 120, **p < 0.01, *p < 0.05.

The multiple correlation matrix shows the relationship between the study variables with *user intention* as the dependent variable. Using the benchmark p-value (sig, p< 0.05; p< 0.01), it can be interpreted that there is a positive correlation between effort expectancy and LMS user behavioral intention (P<0.01). The coefficient of correlation is 0.37**. Similarly, the results illustrate a significant correlation between social influence and LMS user intention of students (P<0.01, 0.439**). There is no correlation between Perceived cost, facilitating condition, and performance expectancy on user intention. Interesting, there is a strong correlation between the perceived cost of LMS usage and facilitating conditions (P<0.01, 0.265**). Meanwhile, there is no difference between perceived cost and performance expectancy (P>0.05).

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4.6 Discussion of Results

This section highlights the major findings, compare with previous studies' findings, conclusions, and practical implications.

4.6.1 Respondents' background information

The study documented the participants' bio-data to get familiar and fully understand them. For this reason, respondents' background information such as; gender, age, and educational background were collected. From the analysis, the male category of the respondents was 62.5%, whereas 37.5% represented females. Age is vital in university education as students are admitted into some programs with age requirements as criteria and lecturers' recruitment. The study disclosed that most of the respondents were within 21-30 years, followed by 31-40 years. Also, 53.3% of the respondents are pursuing degree programs, and 35.8% are on a postgraduate degree.

4.6.2 ICT integration in distance learning

Implementing ICT into distance education has become necessary in today's contemporary world, couple with a large volume of enrollment in various universities and colleges. This has made the study of ICT functions in DE more important. Munyoka (2014) showed that the use of the technology in open distance learning has positively increased the students' depth and satisfaction of learning, increased their awareness of the requirements of such learning system, and above all, increased their performance and passed rate as they could be able to make critical decisions on the wide range of information at their disposal in the LMS. The argument for ICT inclusion in DE is favorable in all empirical studies despite implementation challenges. This current study provided evidence that among the most used ICT devices in DE are computers and

laptops, smartphones such as Samsung, iPhone, infinix, Techno, etc. Additionally, the most frequent ICT tools used in DE at UEW are peripherals device (speaker, USB drive, SD card), radio, and projectors.

Furthermore, it was established that the students use e-learning resources such as blogs/vlogs, search engines (Google, Yahoo, Wikipedia, Bing, google scholar), e-library, databases, or e-journals, e-books or downloading course materials and others. For instance, According to Olson and Wisher (2002), Web-based education provided students "unparalleled access to instructional resources, far exceeding the reach of the traditional classroom. Moreover, Newman and Scurry (2001) argued it makes interaction possible to a much greater extent than traditional distance education. Schindler et al. (2017) found that studies on blogs show consistently positive findings for many behavioral and emotional engagement indicators. They describe a blog (Weblog), is a collection of personal journal entries, published online and presented chronologically, to which readers (or subscribers) may respond by providing additional commentary or feedback.

When it comes to writing and media learning technological tools, the following were identified in the study analysis; WhatsApp (1.2583) is always used among learners in distance education as it is closer to 1. This could be evidence as students rely on WhatsApp messenger group chat for official information. Microsoft office (word, excel, and PowerPoint) had a mean of 1.375, indicating that it is mostly used. Among others are zoom and skype.

Also, in the area of teaching or interaction, ICT plays a decisive role in distance interaction among learners, and teachers as well as teachers, parents, and administrative bodies. It was found that the UEW Learning Management System (LMS), SMS messages/WhatsApp, and Emails are often used for communication in UEW DE. For instance, Jowsey et al. (2020) asserted that when communication is effective, relationships between the student and the staff are optimized, and student satisfaction is increased.

Besides, technological communication tools are presentation tools; these are equipment that helps make presentation delivery interesting and successful. They are also used to present reports or assignments, make instructional delivery effective. This study recognized that most presentation ICT tools are Powerpoint, PDF, word, and excel documents (1.49). This is followed by Projectors, radio & video recording, pictures, and TV, which is (1.52). Like other studies, Andrusyszn et al. (2000) used a video-conferencing facility and asynchronous computer conferencing to enhance learning and promote international collaboration among graduate nursing students. Also, Sadeghi (2019) opined that technological formats, including television, DVDs, teleconferencing, and printable material, and Web learning functionality have made it the first choice for many distance learners.

Among the technologies included in this literature review, the web conferencing software most closely mimics the face-to-face classroom environment. It provides a space where teachers and students can listen to and see each other in real-time. This is a typical classroom activity (lectures, discussing course content, asking/answering questions) (Francescucci & Foster, 2013; Hudson et al., 2012).

4.6.3 Role of ICT tools in distance learning

The vital roles of ICT in today's' DE cannot be undermined. The success of all DE largely depends on effective ICT tools. The functionalities of ICT in DE have been widely documented in the literature. In this research, the following roles were re-affirmed; information search, create a better learning atmosphere, easy download material, learn everywhere anytime, flexible and convenient to distance education, easily interact with classmates, save time, helps focus on learning and makes learning interesting. Relating this results to previous studies, Munyoka (2014) postulated that agreeing or strongly agreeing may be attributed to the adoption of the tele-education system which has made it easier for them to obtain and search all the information they would want related to their learning in the LMS portal and the attempted effort to close the gap between them and the administration through making available most of the information they may want online. According to Traxler (2018), informal distance education, there is enormous potential for widening access to higher education and increasing the student population's diversity since online technologies provide opportunities to learn anywhere, anytime from anyone. These unceasing opportunities offer to DE student is through the undeniable role of ICT. Nagrale (2013) postulated that ICT roles could help get all the knowledge and training anywhere you reside on the planet. On the other hand, the author did not find a statistical difference in the role of ICT in DE concerning gender bias as it was in the trend of response.

4.6.4 Challenges of ICT or LMS integration in DE

The practical implementation of ICT and LMS has faced numerous obstacles to users, including both learners and teachers and administrators. Some of the challenges revealed by this study are an inadequate orientation on how to study online, network

interruption, inadequate modern computers or laptops, and unfavorable geographical location.

In terms of achievement or outcome with the usage of ICT and LMS in DE, the respondents are generally satisfied and it was made known that it improved their learning experiences. The statement "ICT results in poor examination performance were refuted. Similarly, Jowsey et al. (2020) indicated that student achievement improves when students are confident and support information technology. Also, Bernard et al. (2004) note that "a substantial number of [distance education] applications provide better achievement results, are viewed more positively, and have higher retention rates than their classroom counterparts. This means outcome in terms of achievement positively relates to DE.

The attitudinal perception and the excitement of students engaging in online distance students are great. Most research shows little difference in achievement between distance and traditional learners (e.g., Machtmes and Asher, 2000), although using a variety of media, both to deliver pedagogic material and to allow effective communication between learners and tutors do seem to enhance learning to the extent that distance learners can out-perform face-to-face colleagues. Rodrigues (2014) also found that 85% chose to take distance learning course by schedule flexibility. Similarly, this provided evidence that the respondents expressed excitement toward online studies and disagreed that the LMS interface is not user friendly.

4.6.5 Experience on UEW Learning Management System (LMS) based on UTAUT theory

The relationship between UEW LMS and user experience is at the exploration stage, and scholars need to investigate with a theoretical foundation. Based on this, the researcher used the UTAUT theory to examine LMS usage. This was examined using the Pearson correlation to indicate the relationship between the study variables as displayed in table 12. The result emerged a positive correlation between *effort expectancy* and LMS *user behavioral intention* (P<0.01).

In the same way, *social influence* correlates significantly with LMS *user intention* of students. However, no correlation was established between *Perceived cost, facilitating condition, and performance expectancy on user intention*. Remarkably, there is a strong correlation between the perceived cost of LMS usage and facilitating conditions (P<0.01, 0.265**). Meanwhile, there is no difference between perceived cost and performance expectancy (P>0.05).

Commenting on other studies, Admiraal & Lockhorst (2009) stated that the nature of the flexibility to be able to access and deploy on-the-fly, the level of effectiveness, and the costs that must be provided to use e-learning, have prompted the adoption of this technology in many organizations and educational institutions. According to Bervell and Umar (2017), LMS can expand access, reduce costs, and improve the quality of education, which will help SSA institutions meet the growing number of students. As Bervell and Arkorful (2020) stated, LMS has been implemented in Kenya, Tanzania, Uganda, Ghana, Nigeria, South Africa, and other countries, to name a few. As early as 2013, Adkins (2013) pointed out that by 2016, the use of LMS in African higher education institutions will increase at an annual rate of 15%. Today, most African higher education institutions use LMS for distance education to build bridges. The gap

between tutors and students (Naveh, Tubin, and Pliskin, 2012). Commenting on the empirical evidence discussed, it could be observed that LMS usage and users' intention is increasing. As more universities and distance education departments are implementing LMS to enjoy the full advantages it offers.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

The last section of the study presents the major findings, conclusion, and recommendations. The chapter also highlights the limitation of the study as well as future research directions.

5.1 Summary of Major Findings

The data analysis of all the research questions makes many statistical revelations about the study. The study provided evidence that most respondents are within the age of 21-30 years, and 53.3% of the respondents are pursuing degree programs, and 35.8% are on a postgraduate degree. The age range conforms to the standard school-going age where most students fall within and therefore reflect their respective degrees.

This report found that the most used ICT devices in DE are computers and laptops, smartphone peripherals device (speaker, USB drive, SD card). When it comes to the use of e-learning resources; blogs/vlogs, search engines (Google, Yahoo, Wikipedia, Bing, google scholar), e-library, databases or e-journals, e-books, or downloading course materials and others are widely embraced. Again, in terms of writing and media technologies. WhatsApp, Microsoft office (word, excel, and PowerPoint), zoom and skype, LMS, and emails also emerged as the most used writing and interaction tools used in the DE.

The study provided evidence that the major roles of ICT in DE are; information search, create a better learning atmosphere, easy download material, learn everywhere anytime, flexible and convenient to distance education, easily interact with classmates, save time, helps focus on learning and makes learning interesting.

However, the study identified some challenges in ICT integration in distance education. These challenges were grouped into barriers or access, outcome or achievement, and attitude. Among some of the accessibility obstacles on LMS usage are; inadequate orientation on studying online, network interruption, inadequate modern computers or laptops, and unfavorable geographical location. For achievement, it was found that learners perform well as they learn at their own pace; thereby, the statement "ICT results in poor examination performance" was disagreed. In the same way, the study demonstrated that the respondents expressed excitement to online studies and disagreed that "LMS interface is not user friendly."

Furthermore, this research investigated the relationship between UEW LMS and users' experience using UTUAT theory as a measuring variable. It was established that there is a positive correlation between *effort expectancy* and LMS *user behavioral intention*. This implies that users or learners who have a positive behavioral intention to embrace LMS need to achieve learning outcomes. It must be noted that LMS is a software medium that does not learn for users. Interestingly, *social influence* correlates significantly with the LMS *user intention* of students. That is, DE students feel proud and happy to learn from home using LMS, thereby creating good user intention. Whereas the study found no correlation between *Perceived cost, facilitating condition and performance expectancy,* and *user intention*.

5.2 Conclusion

The study investigated the integration of ICT in distance learning education at the University of Education Winneba. Over the years, the Institute for Distance and e-Learning department has not engaged in purely online distance learning until the Covid-19 pandemic forced the school to adopt. Despite the distance learning success rate, there

are many challenges, theories, ICT tools, and adopted practices to be explored for theoretical and practical implications.

First, the study identified the roles and tools of ICT in distance learning education, possible challenges of integrating ICT into distance learning education, explore the usage of learning management system (LMS) by distance learning students and then suggest recommendations to improve ICT in distance learning education.

Secondly, the researcher reviewed literature extensively, covering theoretical, empirical, and conceptual perspectives. The summary and the literature trend helped the study clearly understand the focus of the research objectives, thereby formulating questions to unveil the study directions. Using exploratory research design, which helps gain better insight and familiarity for further research, the researcher targeted students of the Institute for Distance and e-Learning (IDeL), lecturers or tutors, management, and administrative staff of the information technology (IT) support department of UEW. Close-ended question types were designed and administered through an online survey to 120 participants. Using a quantitative analysis approach with Microsoft Excel and SPSS, the data were examined and presented in tables and graphs.

5.3 Recommendations

Based on the findings, discussions, and conclusions of this study, the author put forth the following suggestions for policymakers, learners, lecturers of UEW DE, and similar institutions that practice technology-based distance education.

First, school authorities and administrative personnel should provide intensive online teaching orientation to both learners and tutors. Provide them ideas on all possible challenges, techniques to overcome, or who to contact when it happens. There should

be 24/7 online support to users to assist in any obstacles when encountered immediately.

The superiority of teaching is a significant factor influencing student satisfaction. This is an important consideration for university managers and decision-makers, who can organize distance learning in a way that allows them to deliver ongoing guidance and improvement strategies for teaching staff. Online distance has its early stage of implementation; to sustain learners' interest, lecturers or tutors should provide an effective teaching experience.

Communication with learners on distance learning programs requires extraordinary attention because this type of study involves the increasing use of asynchronous video, audio communication, and a lack of personal contact, which is essential for the development of trust through immediate feedback strategy to learners who have special problems. Some teachers delay replies to students' messages without reason, and communication is sometimes not enough.

Teachers set the time limits to prepare tests, mid-terms, and finals, which do not fit all the students. The students should be informed in advance, and teachers should provide more support to the students when they underestimate the time and effort required in online learning. This also applies to uploading reports or quiz done.

Moreover, the distance department should inspect basic ICT tools (smartphone, computer, or laptop, etc.) as requirements before admissions. This will help students to be ready enough for the course.

5.4 Limitations and Future Research Directions

This study focused on only one university, thus UEW with a sample size less than 200, which is small. The author also employed a close-ended questions that did not give respondents a chance to contribute aside from the questions asked.

It is suggested that interested researchers and academicians could conduct a similar study using a longitudinal or cross-sectional survey to involve more universities in Ghana to generalize results and conclusions. Also, the sample size should be more to uncover many issues in distance education. Lastly, future research should focus on software applications for organizing distance learning platforms, compare from both international and domestic to assess the user experience differences.

REFERENCES

Addy, N. A., & Boateng, P. (2015). ICT and Education: An analysis into Ghana's Universities. *Journal of ICT and Management,* (2), ISSN: 2026 – 6839.

Adkins, S. S. (2013). The Africa market for self-paced eLearning products and services: Attitudes towards technology, learning and training. *International Small Business Journal*, *27*(6), 743–767.

Ajayi, G.O. (2003). *ICT Development and future plans in Africa,* School on Digital Radio Communications for Research and training in Developing Countries. Trieste.

Allen, M., Bourhis, J., Burrell, N., & Mabry, E. (2002). Comparing student satisfaction with distance education to traditional classrooms in higher education: a meta-analysis. *American Journal of Distance Education*, *16*(2), 83-97.

Alshehri, A. (2019). An Implementation of the UTAUT Model for Understanding Students' Perceptions of Learning Management Systems. *International Journal of Distance Education Technologies*, *17*(3), 6.

Altmann, H. & Arambasich, L. (1982). A study of locus of control with adult students. *Canadian Counselor 16*(2), 97—101.

Anderson, J. (1991). *Technology and adult literacy*. London and New York: Routledge.

Andrusyszn, M.-A., Moen, A., Iwasiw, C., Truls, O., Davie, L., Stovring, T., & Buckland-oster, I. (2000). Evaluation of electronic collaborative international graduate nursing education: the Canada-Norway experience. *Journal of Distance Education*, Vol. 15 No. 2, pp. 52-70.

Arkorful, V., & Abaidoo, N. (2015). The role of e-learning, advantages and disadvantages of its adoption in higher education. *International Journal of Instructional Technology and Distance learning*, 29-42.

Arrosagaraya, M., González-Peiteado, M., Pino-Justec, M., & Rodríguez-López, B. (2019). A comparative study of Spanish adult students' attitudes to ICT in classroom, blended and distance language learning modes. *Computers & Education*, 134, 31–40.

Assar, S., Amrani, R. E., & Watson, R. T. (2010). ICT and Education: A Critical Role in Human and Social Development. *Information Technology for Development, 16*(3), 151-158.

Babbie, E. (1989). *The Practice of Social Research. California*: Windsworth Publishing Company.

Badu-Nyarko, S. K., & Amponsah, S. (2017). Assessment of challenges in distance education at University of Ghana. *Indian Journal of Open Learning (ISSN: 0971-2690)*, *25*(2), 87-103.

Baynton, M. (1992). Dimensions of control in distance education: a factor analysis. *The American Journal of Distance Education*, *6*(2), 17-31.

Beare, P.L. (1989). The comparative effectiveness of videotape, audiotape, and telelecture in delivering continuing teacher education. *American Journal of Distance Education*, *3*(2), 57-66.

Benninck, R. (2004). Implementing e-learning from the corporate perspective. *http://wikieducator.org/images/8/83/Bennink.pdf* (accessed 1 July 2020).

Bernard, R. M., Abrami, P. C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L., et al. (2004). How does distance education compare to classroom instruction? A meta-analysis of the empirical literature. *Review of Educational Research*. *74*(3), 379−439.

Bervell, B., & Arkorful, V. (2020). LMS-enabled blended learning utilization in distance tertiary education: establishing the relationships among facilitating

conditions, voluntariness of use and use behavior. *International Journal of Educational Technology in Higher Education*, 17:6.

Bervell, B., & Umar, I. N. (2017). Validation of the UTAUT model: Re-considering non-linear relationships of Exogeneous variables in higher education technology acceptance research. *Eurasia Journal of Mathematics, Science and Technology Education*, 13(10), 6471–6490.

Bhattacharya, I. & Sharma, K. (2007). India in the knowledge economy ‑ an electronic paradigm, *International Journal of Educational Management*, *21*(6), 543‑568.

Bijeesh, N. A. (2017). Advantages and disadvantages of distance learning. Retrieved from http://www.indiaeducation.net/online-education/articles/advantages-and-disadvantages‑of-distance learning.

Billings, D.M., Connors, H.R. & Skiba, D.J. (2001), "Benchmarking best practices in web-based nursing courses", *Advances in Nursing Science, 23*(3), 41-52.

Brown, C. (2017). *Advantages and disadvantages of distance learning.* Retrieved from https://www.eztalks.com/elearning/advantages-and-disadvantages-of-distance-learning.html

Brunello, P. (2010). ICT for Education Projects: A look from behind the scenes. *Information Technology for Development, 16*(3), 232-239. doi: 10.1080/02681102.2010.497275.

Brunk, D. (2002). Telemedicine is effective in reaching rural elderly. *Family Practice News*, 32(5), 30.

Caruth, D. L., & Caruth, G. D. (2013). Distance Education in the United States: From

Chuttur, M. (2009). Overview of the Technology Acceptance Model: Origins, Developments and Future Directions. Sprouts: *Working Papers on Information Systems, 9,* 1–23. doi:10.1021/jf001443p

Cohen, P.A., Eleling, B.J. & Kulik, J.A. (1981). A meta-analysis of outcome studies of visual- based instruction. *Educational Communication and Technology Journal*, *29*(1), 29-36.

Correspondence Courses to the Internet, *Turkish Online Journal of Distance Education*, *14.*

Cragg, C.E. (1991). Nurses' experiences of a distance course by correspondence and audio teleconference. *Journal of Distance Education*, *6*(2), 39-57.

Cross, M. & Adam, F. (2007). ICT Policies and Strategies in Higher Education in South Africa: National and Institutional Pathways', *Higher Education Policy 20(*1), 73–95.

Daugherty, M. & Funke, B.L. (2017). University faculty and student perceptions of web-based instruction. *Journal of Distance Education*, *13*(1), 21-39.

Daugherty, M., & Funke, B. L. (1998). University faculty and student perceptions of web-based instruction. *Journal of Distance Education*, *13*(1), 21-39.

Delling, R. (1966). 'Versuch der Grundlegung zu einer systematischen Theorie des Fernunterrichts', in L. Sroka (Ed.). Fernunterricht 1966. Hamburg: Hamburger Fernlehrinstitut.

Dubin, R. & Hedley, R. (1969). The Medium May Be Related to the Message, University of Oregon, Eugene, OR.

Dyrud, M. A. (2000). The third wave: a position paper. *Business Communication Quarterly, 63*(3), 81-93.

Edumadze, J. K., Ogoe, J. I., Essilfie, G., Edumadze, G. E., & Graham, R. E. (2017). e-Learning at the University of Cape Coast, Ghana-Are our distance education students technologically Ready? *The Online Journal of Distance Education and e-Learning*, *5*(1), 47.

Edwin, M, & Asabere, N.Y. (2016). The Effectiveness of Distance Education in Ghana. *Science Journal of Applied Mathematics and Statistics,* Vol. 4, pp. 159-167.

Ellis, R. K. (2009). Field guide to learning management systems, ASTD learning circuits. Retrieved 7th June, 2017 from http://www.astd.org/~/media/Files/Publications/LMS_fieldguide_20091.pdf.et-Abstract.pdf.

Finger, G. & Rotolo, C. (2001). Telephone teaching: towards constructivist teaching for rural and remote students", paper presented at the Annual Conference of the Australian 3Association for Research in Education, Fremantle, 2-6 December, available at: www.aare

Gudanescu, N. (2010). Using modern technology for improving learning process at different educational levels. *Procedia - Social and Behavioural Science*, *2*(2), 5641-5645.

Gunawardena, C. N., & McIsaac, M. S. (2003). Distance education. In D. Jonassen (Ed.), *Handbook for research on educational communications and technology* (pp. 355-396). New York: Simon and Schuster.

Gunton, T. (1993). *Dictionary of Information Technology.* London: Penguin.

Hamari, J., Shernoff, D. J., Rowe, E., Brianno C., Asbell-Clarke, J. & Edwards, T. (2016). Challenging games helps students learn: An empirical study on engagement, flow and immersion on game-based learning. *Computers in Human Behaviour, 54*, 170-179.

Hamari, J., Shernoff, D. J., Rowe, E., Brianno C., Asbell-Clarke, J. & Edwards, T. (2016). Challenging games helps students learn: An empirical study on engagement, flow and immersion on game-based learning. *Computers in Human Behaviour, 54*, 170-179.

Hameed, S. Badii, A. & Cullen, A. J. (2006). Effective e-learning integration with traditional learning in a blended learning environment. *European and Mediterranean Conference on Information System*, (25-26).

Hameed, T. (2006). *ICT as an enabler of Socio-Economic Development.* School of Engineering, Information & Communications. Daejeon.

Hara, N., & Kling, R. (2000). Student distress in a web-based distance education course. *Information, Communication & Society*, *3*(4), 557-579.

Higham, N. (2003) "The future of digital TV", BBC News Online, 12 February, available at: http://

news.bbc.co.uk/1/hi/entertainment/tv_and_radio/2744859.stm (accessed 3 September).

Hobbs, T., Finger, G. &Torrisi-Steele, G. (2000). Evaluation of the Charleville School of Distance Education whole school telephone teaching pilot, an evaluation report prepared for Education Queensland by EdData, Brisbane

Honeyman and Miller (1993). Agriculture Distance Education: A valid Alternative for Higher Education.

Hope, A., & Guiton, P. (2005). *Strategies for Sustainable Open and Distance Learning*, Vol. 6, New York: Routledge/Falmer Press.

Howard, D. (2002). *Enhanced by Technology, not Diminished: A Practical Guide to Effective, Distance Communication*, McGraw-Hill, New York, NY.

Hutt, M. (2017). *Top 10 disadvantages of distance learning.*

https://www.eztalks.com/elearning/top-10-disadvantages-of-distance-

learning.html

Jowseya, T., Fosterb, G., Pauline Cooper-Ioelu, P., & Jacobs, S. (2020). Blended learning via distance in pre-registration nursing education: A scoping review. *Nurse Education in Practice*, 44 102775.

Judy, S. & Angela, C. (2008). *ICT teaching and learning in a new educational paradigm: Lecturers' perceptions versus students' experiences.* Monash University. Caulfield East.

Khasawneh, M. (2015). Factors Influence e-Learning utilization in Jordanian Universities: Academic staff perspectives. *Social and Behavioural Sciences,* 210; 170 – 180.

Kimilogu, H., Ozturan, M. & Kutlu, B., (2017). Perceptions about and attitude toward the usage of e-Learning in corporate training. *Computers in Human Behaviour* 72, 339-349.

Kirby, D.M. & Boak, C. (1987). Developing a system for audio-teleconferencing analysis (SATA). *The Journal of Distance Education*, *II*(2), 31-42.

Knox, A. (1977). Adult Learning and Development, Jossey-Bass, San Francisco, CA

Kotouaa, S., Ilkana, M., & Kilic, H. (2015). The Growing of Online Education in Sub Saharan Africa: Case Study of Ghana. *Social and Behavioral Sciences*, (191) 2406 – 2411.

Lam, S., & Fai, H. K. (2010). Personal Development Empowerment Through ICT IN Corporate Learning: A Case Study of two Developing Cities in China. *IJAC*, 14-20.

Love, M. & Banks, S. (2001). Using interactive digital television to support basic skills learners. *Journal of Educational Media*, 26(1), 35-48.

Machtmes, K. and Asher, W. (2000). A meta-analysis of the effectiveness of telecourses in distance education. *American Journal of Distance Education*, *14*(1), 27-46.

Markova, T., Kimilogu, H., Ozturan, M. & Kutlu, B., (2017). Perceptions about and attitude toward the usage of e-Learning in corporate training. *Computers in Human Behaviour,* 72, 339-349.

Maro, A.H (2008). University Library and ICT Collaborative Strategies: The Open University of Tanzania. HURIA.VIII, (1)

McCausland, H., Wache, D. & Berk, M. (1999). *Computer literacy; its implications and outcomes.* A case study from the Flexible Learning Centre. University of South Australia

McIsaac, M.S., & Gunawardena, C.N. (1996). Distance education, in Jonassen, D.H. (Ed.), Handbook of Research for Educational Communications and Technology, 1st ed., Lawrence Erlbaum Associates, Mahwah, NJ, pp. 403-38.

Mensah, F. S. (2017). Ghanaian Tertiary Students' use of ICT. *Global Journal of Human-Social Science Research 2(5).*

Mikre, F. (2011). The Roles of Information Communication Technology in Education: Review Article with Emphasis to the Computer and Internet. *Ethiopian Journal of Education and Sciences*, *Vol. 6*(Issue 2), pp. 109-126.

Mnyanyi, C. B., & Mbwette, T. S. A. (2009). *Open and Distance Learning in Professional Development in Third World Countries*. A paper presented at the Maastricht's 23rd International Conference on Distance Education. June 2009, 1-7.

Moore, M. (1990). *Contemporary Issues in American Distance Education*. Pergamon Press, New York, NY, pp. i-vii.

Moore, M. G. (1998). *Introduction. In C. C. Gibson (Ed.), Distance learners in higher education: Institutional responses for quality outcomes*. Madison, WI: Atwood.

Moore, M., & Kearsley, G. (2005). *Distance education: A systems view* (2nd ed.). Belmont, CA: Wadsworth.

Munyoka, W. (2014). Evaluation Impact of Tele-Education as New Open Distance Learning Delivery Mode on Learners in Botswana. *Social and Behavioral Sciences*, (116), 1248 – 1252.

Mushi, H. (2006). Typology of learner Interaction in Open and Distance Learning. (ODL). *JIPE. I, (2).*

Mwakilama, P. & Nawe, J. (2005). The Role of Academic Libraries in Facilitating Institutional Transformation Programmes: The Case of Two Constituent Colleges of the University of Dares salaam. *University of Dares salaam Library Journal, 7*(2).

Nagrale, P. (2013). *Advantages and disadvantages of distance education.* https://surejob.in/advantages- anddisadvantages-of-distance-education.html

Navarro, P. & Shoemaker, J. (2000). Performance and perception of distance learners in cyberspace. *The American Journal of Distance Education*, Vol. 14 No. 2, pp. 15-35.

Newman, F. and Scurry, J. (2001). Online technology pushes pedagogy to the front. *The Chronicle of Higher Education*, Vol. 13, pp. B7-B10.

Niiranen, S., Lamminen, H., Mattila, H., Niemi, K., & Kalli, S. (2002). Personal health-care services through digital television. *Computer Methods and Programs in Biomedicine*, *68*, 249-59.

Oblinger, D. G. & Oblinger, J. L. (2005). *Educating the net generation, An Educause e-book publication.*<http://www.educause.edu/ir/library/pdf/pub7101.pdf> [28/08/14].

Ohene, J. B., & Essuman, S. O. (2014). Challenges faced by distance education students of the University of Education, Winneba: Implications for strategic planning. *Journal of Education and Training*, *1*(2), 156-176.

Oliver, R. (2015). *Creating Meaningful Contexts for Learning in Web-based Settings. Proceedings of Open Learning, 2000,* (pp 53-62). Brisbane: Learning Network, Queensland.

Oliver, R. (2017). *The role of ICT in higher education for the 21st century: ICT as achange agent for education*, Edith Cowan University, Perth, Western Australia.

Ololube, N. P., Arrosagaraya, M., & González-Peiteado, M. (2015). School Effectiveness and Quality Improvement: Quality Teaching in Nigerian Secondary Schools. *The African Symposium, 5*(4), 17-31.

Olson, T.M. & Wisher, R.A. (2002). The effectiveness of web-based instruction: an initial inquiry. *International Review of Research in Open and Distance Learning*, October, available at: www.irrodl.org/content/v3.2/olsen.html (accessed 21 May 2020).

Oviatt, B.M., Bansal, P. & Houghton, S. (2000). An experimental test of CD-ROM-aided instruction in transnational management. *Journal of Teaching in International Business*, *11*(3), 37-59.

Oviatt, B.M., Bansal, P., & Houghton, S. (2000). An experimental test of CD-ROM-aided instruction in transnational management. *Journal of Teaching in International Business*, *11*(3), 37-59.

Pajo, K. (2001). Barriers to the uptake of web-based technology by university teachers. *Journal of Distance Education*, Vol. 16 No. 1, pp. 70-84.

Panagiotakopoulos, C. (2002). Student dropout at the Hellenic Open University: evaluation of the graduate program Studies in Education. International Review of Research in Open and Distance Learning, available at: www.irrodl.org/content/v3.2/

Paulsen, K.J., Higgins, K., Miller, S.P., Strawser, S. & Boone, R. (1998). Delivering instruction via interactive television and videotape: student achievement and satisfaction. *Journal of Special Education Technology*, *13*(4), 59-77.

Powell, R., Conway, C. & Ross, L. (1990). Effects of student predisposing characteristics on student success. *Journal of Distance Education*, *5*(1), 5-19.

Rodriguesa, S.J., Affonso, A. B., Quinelato, E., & Montiela, J. M. (2014). Distance learning in undergraduate education: the challenges of building a collaborative environment. *Social and Behavioral Sciences*, (116) 3499 – 3501.

Rotter, J. B. (1989). Autonomy and relatedness as fundamental to motivation and education, *Journal of Experimental Education*, *60*, 49-66.

Saba, F. (1988). Integrated telecommunications systems and instructional transaction. *The American Journal of Distance Education 2*(3), 17—24.

Saba, H., & Shearer, R. (1994). Verifying key theoretical concepts in a dynamic model of distance education. *American Journal of Distance Education 8*(1), 36-59.

Sadeghi, M. (2019). A shift from classroom to distance learning: advantages and limitations. *International Journal of Research in English Education*, 4:1.

Schindler, L. A., Burkholder, G.J., Morad, O. A., & Marsh, C. (2017). Computer-based technology and student engagement: a critical review of the Literature. *International Journal of Educational Technology in Higher Education*, 25.

Shafiqul, A. (2009). Technology Based Literacy Education through Distance Mode in Bangladesh: Problems and Prospects. Retrieved from http://www.col.org/pcf2/papers/alam.pdf on 27 June 2020

Shah M. S. H. & Shafiul, A. S. M. (2010). *The Role of Information and Communication Technologies (ICT) in Delivering Higher Education – A Case of Bangladesh*. Southeast University, Dhaka.

Sharma, A., & Vatta, S. (2013). Role of learning management systems in education. *International Journal of Advanced Research in Computer Science and Software Engineering*, *3*(6), 997-1002.

Simonson, M. (2012). *Teaching and learning at a distance: Foundations of Distance Education*. Boston, MA: Pearson.

Slechtova. P (2015). Attitudes of undergraduate students to the use of ICT in education. *Social and Behavioral Sciences,* 171, 1128 – 1134.

Swindell, R., & Mayhew, C. (1996). Educating the isolated ageing: improving the quality of life of the house-bound elderly through educational tele-conferencing. *International Journal of Lifelong Education*, *15*(2), 85-93.

Teo, T. (2011). Assessing the cross-cultural validity study of the E-learning Acceptance Measure (ElAM): A structural equation modeling approach. *The International Journal of Educational and Psychological Assessment, 8,* 43–53.

Thurmond, V.A., Wambach, K. & Connors, H.R. (2002). Evaluation of student satisfaction: determining the impact of a web-based environment by controlling for student characteristics. *American Journal of Distance Education*, *16*(3), 169-89.

Traxler, J. (2018). Distance learning: Predictions and possibilities. *Educ. Sci, 8*(1), 35.

Tripathi, P. C. (2002). *A textbook of Research Methodology in Social Sciences*. Sultan Chand and Sons; New Delhi

UNESCO (2002). Open and Distance Learning Trends, Policy and Strategy Considerations, UNESCO.

Venkataraman, S., & Sivakumar, S. (2015). Engaging students in group-based learning through e-Learning techniques in higher education system. *International journal of Emerging Trends   in Science and Technology*, *2*(1), 1741-1746.

Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, *27*(3), 425-478.

Watson, W. R., & Watson, S. L. (2007). An argument for clarity: What are learning management systems, what are they not, and what should they become? *TechTrends*, *51*(2), 28–34.

Williams, P. (2001). Learning area network: information dissemination and online discussion in an educational environment: The Capabil-IT-y project. *Aslib Proceedings*, *53*(3), 99-107.

Williams, P. (2002). The learning web: the development, implementation and evaluation of internet-based undergraduate materials for the teaching of key skills. *Action for Learning in Higher Education*, *3*(1), 40-53.

APPENDIX A

UNIVERSITY OF EDUCATION WINNEBA-KUMASI CAMPUS

MSC INFORMATION TECHNOLOGY

QUESTIONNAIRE (students only)

Topic. Integration of ICT in distance learning education: empirical evidence from UEW

Please this questionnaire is for academic purpose and your identity and any information you provide will not be revealed.

Please tick [√] or write where applicable.

SECTION A: Background information

1. Gender   ( ) Male   ( ) Female

2. Please indicate the age range you belong to

    Below 20 ( )   21 – 30 ( )   31-40 ( )   41-50 ( ) 5   1 and above ( )

3. Educational achievement level

    Diploma ( )   Degree ( )   Postgraduate ( )   Certificate/professional course( )

4. Please what is your current level

    Level 100 ( )   Level 200 ( )   Level 300 ( )   Level 400 ( )

SECTION B: ICT integration in distance learning

	Please tick how frequently you use the following ICT tools in your distance learning education	Always	Sometimes	Never
	ICT Devices			
1	Computer or laptop			
2	Smartphone (Samsung, iPhone, infinix, Techno, etc			
3	Peripheral device (speaker, USB drive, SD card, etc.			
4	Radio, TV, cassette, projectors, mode			
	E resources			
5	E-library, Databases or e-journals, e-books			
6	Blogs/vlogs, search engines (Google, Yahoo, Wikipedia, bing, google scholar			
7				
8	Apps (oxford dictionary, translator, text editor, spell checker, grammar checker, etc.)			
	Writing and Media tools			
	Grammar checker and Spelling check			
10	Photo editor, Text editor			
11	Microsoft Office (Word, PowerPoint, excel			
	learning tools			
12	Whatsapp			
13	Skype			
14	Instagram			
15	Imo			
16	Facebook			
17	Zoom			
	Online learning tools			
18	UEW Learning Management System (LMS)			
19	Note-taking software (OneNote			
20	Tutorial audios and videos			
21	Youtube, Google scholar videos			

	Messenger tools			
22	Whatsapp, skype, zoom			
23	Facebook Messenger, Instagram			
24	E-mails			
25	SMS messages			
	Presentation tools			
26	photo editor, text editor, video maker			
27	Prezi, PowerPoint, PDF, word, and excel document			
28	Projectors, radio & video recording, pictures			

SECTION C: What is the role of ICT tools in your distance learning?

Key: Strongly Agree (SA) = 5, Agree (A) =4 Neutral (3) = N, disagree (2) = D

Strongly Disagree (1) = SD

	What role does ICT play in distance education	1	2	3	4	5
	Distance learners					
1	My phone, computer/laptop help me access learning materials					
2	Information search is easy by using ICT tools than by visiting the library.					
3	ICT tools create a better atmosphere in the distance studies					
4	I download/upload learning materials on the school website with ICT tools					
5	I can learn everywhere/ anytime with ICT tools					
6	With ICT, is flexible and convenient to pursue distance education					
7	I can interact with my classmates using ICT tools					
8	I save time if I use ICT tools for learning.					
9	I can focus on learning more if I use ICT tools					
10	Using ICT tools to learn makes me happy.					

SECTION D: RQ2: Challenges in ICT or LMS integration in your studies

Since the integration of ICT or LMS in your studies, tell us the challenges you have face so far by ticking *Strongly Agree (SA) = 5, Agree (A) =4, Neutral (N) = 3, Disagree (D) = 2 Strongly Disagree (SD) = 1*

	Challenges in ICT or LMS integration in your studies	1	2	3	4	5
	Barriers or accessibility					
B1	My school do not provide orientation on online studies					
B2	Network interruption affects my online studies					
B3	Slow internet speed					
B4	There is no online support when I encounter a problem					
B5	Access to quality and modern mobile or computer devices affect my studies					
B6	My location is not ideal to study online					
	Achievement or outcomes					
A1	ICT tools have increased my understanding					
A2	I perform poorly when writing quiz/exams online					
A3	A low level of interaction affects my learning outcome					
A4	Generally, I am satisfied using ICT tools in distance learning					
	Attitudes					
X1	I feel excited about studying online					
X2	My concentration level is low during online studies					
X3	I feel bored, LMS interface is not user friendly					
X4	ICT/interactive audio-visual motivates me to prefer to learn at my own pace					
X5	I am not comfortable using ICT tools in distance learning					

SECTION E: Tell us your experience of the UEW Learning Management System (LMS)

Keys: Strongly Agree (SA) = 5, Agree (A) =4, Neutral (N) = 3, Disagree (D) = 2

Strongly Disagree (SD) = 1

	LMS usage assessment based on UTAUT theory	1	2	3	4	5
	Performance Expectancy					
PE1	LMS has improved my performance					
PE2	I feel motivated when I learn using LMS					
PE3	I am now familiar to use the LMS method					
PE4	I always understand whatever I learning on LMS					
PE5	I get high scores since the introduction of LMS					
	Effort expectancy					
EE1	Learning on LMS required much effort					
EE2	Generally, accessing LMS is complex					
	Social influence					
SI 1	I used LMS/ICT tools because my mates use it					
SI2	I feel highly esteem using LMs (Social status)					
SI3	I have the habit or culture of learning from LMS					
	Facilitating Condition					
FC1	I believe I can achieve my learning objectives by using LMS (Self-efficacy)					
FC2	I have experience learning ICT/LMS already					
FC3	Generally, I have all the resources to access LMS					
	Perceived cost					
PC1	Data usage (internet) cost is expensive to access LMS					
PC2	Smartphones used to access LMS is expensive					
PC3	Cost of computer to access LMS is high					

APPENDIX B

UNIVERSITY OF EDUCATION WINNEBA-KUMASI CAMPUS

MSC INFORMATION TECHNOLOGY

QUESTIONNAIRE (Q2) (lecturers and administrators)

Topic. Integration of ICT in distance learning education: empirical evidence from UEW

Please this questionnaire is for academic purpose and your identity and any information you provide will not be revealed.

Please tick [√] or write where applicable.

SECTION A: Background information

1. Gender   ( ) Male   ( ) Female

2. Highest educational qualification

   ( ) High School   ( ) College/University   ( ) Postgraduate

3. Position of the respondents

   Administrator [   ]   Lecturer/tutor [   ]   Management member [   ]

	Lecturers/Tutors	1	2	3	4	5
1	I give guidance on how to use ICT tools for learning tasks to be completed at home.					
2	With ICT tools I prepare lessons plans easy					
3	With ICT tools make presentation is more interesting					
4	I have learn a lot using ICT tools					
5	I use ICT tools to make course materials available to learners on LMS, Whatsapp etc.					
6	ICT helps me to communicate with my students					
7	ICT/LMS has reduce my workload					
8	The university has modern computers to support LMS learning system					

9	The university has technical IT support personnel to manage the LMS					
10	The university internet facility is 3 and 4G accessible					
11	The IT department is available to provide 24/7 support					