ASSESSMENT OF AVAILABILITY AND UTILIZATION OF E-LEARNING TECHNOLOGY IN BIOLOGY EDUCATION PROGRAM IN UNIVERSITY OF BENIN CITY

BY

FASUNON OLUWADAMILOLA OGAGAOGHENE
EDU1702543

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A RESEARCH SUBMITTED TO THE DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY, FACULTY OF EDUCATION, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF SCIENCE IN EDUCATION B.SC (ED). DEGREE IN BIOLOGY EDUCATION OF THE UNIVERSITY OF BENIN, BENIN CITY

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CERTIFICATION

We, the undersigned, certify that this research project was carried out by **FasunonOluwadamilolaOgagaoghene** in the Department of Curriculum and Instructional Technology, Faculty of Education, University of Benin, Benin city.

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DEDICATION

This work is dedicated to Almighty God for his love and mercies

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TABLE OF CONTENTS

CHAPTER FOUR:-PRESENTATION OF RESULTS AND DISCUSSION OF RESULTS

ABSTRACT

This research work assessed the availability and utilization of E-learning technology in the University of Benin, 100 respondent were sampled, the research was carried out using questionnaire as it's instrument of data collection in accordance with the specification of the research questions. The validation of the instrument was obtained through scrutiny of the project supervisor and one other lecturers from the department of CIT, the reliability of the instrument was determined through Pearson product moment this yielded a reliability ratio of 0.669, the anlaysis and interpretation of data involved the use of mean and standard deviation to answer the research question. The study revealed that E-learning technologies are available to some extent Biology Students have projectors in their lecture hall for teaching biology. The study revealed the challenges that hinder effective utilization of E-learning technologies are poor connectivity and inability to acquire data, power failure. It was recommended amongst others that the E-learning teaching and learning method should be adopted by the school and that all necessary provisions in which constant power supply is a major factor should be made readily and affectively available.

CHAPTER ONE

INTRODUCTION

Background of the Study

Technology has greatly impacted on education and training globally by improving teaching and learning. Okoli, C. C and Osuafor, A. M (2019) asserted that the emergence and explosion of information and communication Technology (ICT) over the past years has brought drastic changes in the nature of the learning environment. "This has brought a paradigm shift in the method of learning from traditional to modern where the teacher is seen as the facilitator of learning and the learner's participating actively through the use of modern learning facilities "The development of the individual is the development of the society and the nation in which E-learning plays a role.

The Wikipedia asserted that Biology Education is the Education aspect that studies the structure, function, heredity and evolution of all living things. Micro-organism, fungi, plants and animals. Biology offers individuals the opportunity to engage with the diversity of living

organism, and their local and wider environment. It enables individuals to understand their own bodies and the changes we may experience and to apply the range of enquiry approaches to investigating that explains the living world "Bio".Biology education program is used to promote good personal and community practices, it help to instill in the next generation of citizens an understanding appreciation and health skepticism about what science can achieve and to use the knowledge of science to advance society. In other to achieve this objective, the use of technology becomes very important as a means of learning and teaching.

E- learning is defined by various authors according to their personal knowledge and perspective, but they all seem to agree that e-learning comprises all forms of electronically supported learning and teaching which is procedural in nature with the goal of influencing the learner's knowledge creation, E-learning can be described as a virtual classroom , E-learning is a broad term for electronic method of learning which is closely associated with internet- learning in general. According to Olugbeko (2013), E-learning education is the wholesome integration of

modern telecommunication equipment and ICT resources, particularly the internet, into the system." E-learning is a computer based educational tool or system that enables training or learning to take place anywhere and at anytime. Chokri (2011) defines E-learning as a concept that includes many applications, process and learning method. Olojo (2012), asserted that E-learning technologies offers learner's control over content, pace at learning, sequence of learning and Time management which enables them to tailor their experiences to meet their personal learning. Nwokolo Sunday Anthony, Solomon Alli, Garba Mohammed Rabiu (2017) , Explained E-learning as transforming the role of the teacher to that of a facilitator while it present faculty with a lot of research opportunities. E-learning is leading to education revolution that will make learning individualized (adaptive learning)." E-learning encompass learning at all levels ,both formal and non-formal that uses an information network, the internet, an intranet(LAN) or extranet(WAN), whether wholly or in part, for course delivery, interaction, evaluation and facilitation which

Salawudeen (2010) explained uses network technologies to create, deliver and facilitate learning anytime and anywhere.

The wikipedia, refers to e-learning as the use of electronic media and information technology (ICT) in education. Broadly speaking, it includes all forms of educational technology in teaching and learning. E-learning Technology Enhanced Learning (TEL) Computer Based Interaction (CBT) Computer Based Training (CBT), Computer Assisted Instructor or Computer Aided Instruction (CAT), Internet Based Training (IBT), Web Based Training (WBT) online education virtual education.

Electronic learning also known as E-learning is increasing becoming acceptable for teaching, learning and administration purposes in higher institutions all over the world. ICT can be utilized to improve instructing and learning of Biology. The role of E-learning facilities in curriculum implementation is recognized by the Nigeria National policy on Education where it stated that "the government shall provide facilities and necessary infrastructures for the promotion of ICT and E-learning"(FRN,2013 p.53). The origin of the term E-learning is not certain,

although it was suggested that the term most likely originated during the 1980s with the similar time frame of another delivery made online learning.

Availability of E-learning facilities depicts the presence and accessibility of electronic devices that are applied in teaching and learning. Unfortunately, the availability and adequacy of E-learning facilities in Nigeria tertiary institutions are doubtful (Wokocha, Elechi, Babalola, Agbagbue, Adanma and Umah,2017); Osuafor and Emeji (2012) and Gabadeen, Alabi and Akinnubi (2015) discovered that these E-learning Technology are relatively available to the teachers and students in Nigeria universities. Evidence available also shows that the educators are seriously challenged in the use of available ones owing to such factors as poor awareness of electronic learning facilities available for instruction, irregular power supply, poor bandwidth connectivity and poor maintenance of available facilities for sustainability (Okoli,2012).

Objectives of Utilization of E-Learning Technology

The internet has granted access to a wealth of information previously unavailable to people. The internet can allow students to research background information related to practical work being conducted, it allows students to choose the research areas they want to study, the depth of their research.

The integration of ICT in teaching and learning process has resulted in a new system of learning globally referred to as e-learning. According to the facilitating e-learning industry law as cited in Dae, Hyekung and Hyeonjin (2010), e-learning is a learning process utilizing electronic devices information technology and broadcasting communication technology. E-learning is only made possible when ICT infrastructure has been put in place. Successful utilization of e-learning in teaching and learning process According to Al-adwan and Smedley (2012) is highly dependent on availability of e-learning technologies, teachers ICT and pedagogical competencies.

According to Wikipedia,E-learning if integrated into Biology education program could attract the following benefits to the students, lecturers and other stakeholders in Biology education, it is an important component of teacher preparation and teacher professional learning.

- Science educators should use online tools to promote sharing of information discourse, critical analysis and collaboration between students and teachers of various locations throughout the world.
- It promotes motivation of students and teachers to engage in research for indebt knowledge in Biology education, information communication technology and general education.
- Help to engage students in learning process and skills which will be useful in social life and in the world of work.

Universities today cannot improve the academic achievement of students or the overall value of their programme without sufficiently making use of e-learning technologies in teaching and learning (Donahoo and Whitney, 2006) Onokpaunu (2016) affirmed that the future of education is in the internet, as a lot of online universities are on the

increase, making teaching and learning in four corners of a classroom less significant. Pollicia Simpson, AidredgeinUzo-Okonkwo and Oduh (2017) asserted that the widespread availability of the Information and Communication Technology (ICT) has precipitated a vast changed in education and especially in the delivery of instruction. This depicts that effective teaching and learning cannot take place without the use of e-learning technologies / facilities in tertiary institutions.

Some e-learning platforms used in developed countries as listed by Ipage (2011) include websites, wikis, blogs, second life, email, twitters, course management, system video, audio text chat, video conferences software etc.

"The rapid changes that have taken place all over the world pose a challenge to the education sector in Nigeria, it has become imperative for Nigeria to complement the traditional pedagogical practices that still underpin its educational system". In order to revolutionize the educational sector system, the country needs ICT not only as tools for teaching and learning but also for effective communication across institutions. Another

formidable challenge to the use of information and communication technology in infrastructural deficiency. Lack of these basic infrastructures to power and run ICT equipment hamper the effective application of e-learning as most faculty of education lack the necessary capacity to put a stand by power generating plant for this purpose. Also, some lecturers lack the skills to fully utilize e-learning technology in curriculum implementation, hence the traditional chalk and duster approach still dominates the colleges of education pedagogy.

The availability and use of e-learning in Biology Education Program in Faculty of Education has become imperative because of the fact that these institution would produce teacher that need to teach / educate students or learners of the values of E-learning. Also by looking at the teaching – learning in Biology education in which a lecturer has to teach quite a large number of students at a time, if E-learning is not used nothing or little can be achieved. Teaching may not be effective if a teacher has to stress him/her self to an extent beyond his/her capability in the course of the teaching. Education at the tertiary level should be e-

learning compliant as it is being found, useful in other sectors such as in e-banking, e-commerce, e-government etc. there is therefore the need to examine, if E-learning technology is available and used in Biology Education.

Statement of the Problem

It has been discovered that e-learning is a very important instructional tool to facilitate the transfer of information and an effective means of communication in tertiary institutions. E-learning is equally an important tool when it comes to teaching and learning of wide range of topics in Biology (Evaress and Lara, 2011) showed that emergence of e-learning application in education delivery services of tertiary institutions of education bring about a lot of problems. Some of the lecturers in tertiary institution in Nigeria lack the adequate knowledge coupled with power outage, obsolete e-learning facilities, lack of skilled manpower and poor infrastructure required for effective e-learning instructional delivery.

Technology should serve as the attractive tools and infrastructure for the younger generation to facilitate the awareness and actual

craftsmanship in biological science courses in our local communities. Conversely, it is one thing to have access to e-learning facilities and it is another thing to effectively utilize them in teaching and learning (Akubueze, 2012). Therefore, inadequate utilization of new technologies facilities by teachers could result to producing graduates with only theoretical knowledge and less experience in practical courses which required the application of e-learning skills. The universities lecturers are expected to equip graduate with relevant technological skill for effective performance in this global world. They need to embrace e-learning facilities to become competent in the use of digital technologies for teaching in the digital age. However, the use of information and communication technology E-learning has virtually changed the country nature, procedure, tools and practices of human endeavor (Umoru and Mnasi, 2015)

However, much has not been done empirically to access the availability and utilization of e-learning technologies in Biology education

programs in university of Benin, Faculty of Education. In order to bridge the gap, hence this study.

Purpose of the Study

The purpose of the study is to access the availability and utilization of e-learning technologies in Biology Education Program in Faculty of Education in University of Benin. The specific objectives of the study are to;

1. Determine the extent to which e-learning are available for Biology Education Program in Faculty of Education.
2. Determine how competent teachers and students use E-learning technologies/facilities in teaching and learning of Biology Education program in Faculty of Education.
3. Examine the constraint of effective utilization of e-learning technologies in Biology Education Program in Faculty of Education.
4. Find out the benefits of using e-learning technologies in Biology Education program.

Research Questions

1. What is the extent of availability of e-learning facilities for teaching Biology Education in university of Benin?
2. What are the challenges encountered in the use of e-learning facilities in the University of Benin?
3. What are the benefits of the use of e-learning facilities for learning in the university?
4. Do Biology lectures utilize internet facilities in relating academic issues with their students in the University of Benin?
5. Do Biology lecturers utilize e-learning facilities in lecture delivery in the University of Benin?

Research questions 4 and 5 were formulated into hypothesis.

HYPOTHESIS 1:-Biology lecturers do not significantly utilize internet facilities in relating academic issues with their students in the University of Benin

HYPOTHESIS 2:-Biology lecturers do not significantly utilize e-learning facilities in lecture delivery in the University of Benin.

Significance of the Study

The findings of this study are expected to be beneficial to students and researchers, this study will encourage management of tertiary institutions to introduce platforms for e-learning usage, such platform like learning open courseware etc will create opportunity for administration, documentation, examination, feedback giving and reporting of classroom and online event.

In higher institution of learning, students are exposed to more of the practical teaching of information and communication technology (ICT) than the theoretical aspect via e-learning. It will be effective to Biology education lecturers by applying different forms of e-learning method in their teaching. It will also be essential to teachers by collaborating with other institution, especially foreign institution from where lecture, seminars and other activities could be relayed. The government as well will be encourage to ensure security and adequate maintenance and

upgrading of e-learning technologies for use. It will encourage government to come up with relevant supervisory agencies that will ensure that e-learning technologies are integrated in the teacher education programs of universities and colleges of education which will ensure that the graduates are capable of using ICT resources to support their teaching when employed.

This study will ensure that both federal and state government will adequately provide e-learning technologies for use by the lecturers and students in all fields of study. Because e-learning technologies are expensive to acquire and cannot be left in the hands of tertiary institutions. The Ministry of Education will be able to organize regular, re-training programmes for lecturers to enable them update their skills on utilization of e-learning technologies for improved academic performance.

Scope of the Study

The scope of this study is limited to assessment of availability and utilization of E-learning technology in Biology Education program in

University of Benin. Meanwhile, the study will be delimited to Biology students in the University of Benin.

Limitation of the Study

The limitation of this work was that of duration, since the period of the research was during the researcher's engagement in other academic work and preparation for exams.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter reviews some of the existing literature on levels of the assessment of availability and utilization of E-learning technologies in Biology Education, the review will be written along the following sub – headings;

- Concept of E-learning/conceptual Framework
- Definition of E-learning / History
- E –learning adoption in Nigeria institutions:-Readiness of Learners
- Concept and definition of Biology Education
- Theoretical Framework
- New Technologies in Biology Education
- Technological Changes in Biologial education on Instructional and Practice
- Delivery of Instruction Via E-learning
- Challenges and constraints to Effective utilization of E-learning Technologies and quality assurance in Biology Education

- Benefits of utilization of E-learning in tertiary Institution Education program
- Review of empirical studies
- Summary of Reviewed Related Literature.

Conceptual Framework

E – Learning has offered tremendous opportunities for teaching by electronic means (Kacerauskas and Kusaityle, 2020) students that undertake electronic studies generally performed better than those in face to face courses. Andreas (2020) opined that the academic performance of learners that used the electronic approach supersedes those who studied the traditional approach. E – learning is a new learning model in Nigeria with all its potentialities. According to Wikipedia, The term E-learning defines technology mediated and digitally empowered learning that utilizes hardware) e.g PCs, Tablets, printed digital camera, digital videos, scanner, overhead projectors; OHP and OHP screen), software (operating systems, clard technologies, applications (apps) writing edifying MS office) and (CD textbooks that fall in the categories of courseware, OERS, e-content) and others (e.g USB drives, CD-ROM), whether from a

distance or face to face classroom setting (PC helped learning) to empower teacher to student interactions. Actually, it moves the citadel of learning from traditional to module – give driven, ICT – based customized and adaptable and synergistic learning that involves learners, instructors, facilitators and specialist (Falame, 2015, Olobo 2012).

While the traditional was teacher focused, the learner focused is facilitated technology affordances which empower learner in sharing and receiving content regularly, to empower students and teachers to produce progress and share learning contents in a more regular structure (Obiacha 2013). Studies (e.g) Falana, 2015; Marks and Olobo 2012; Sloan 2014) argue that e-learning is a significant and compelling strategy that should be introduce into institutions current learning style and teaching method for students and for community oriented learning. The use of e-learning strategy to execute educational contents and modules in Nigerian makes for educator – student dynamism in the ways of instructing and learning of the substances (Liverpool 2010).

Kajetanowtez and Wierzesbewski (2010) asserted e-learning as productive method that advance self-study cum continuous testing and developmental assessments which incite legitimate checking of instructive advancement and periodic accomplishment. General examination report demonstrate that e-learning gives beneficial outcome on learner's accomplishment, Learners introduce atmospheres where interest are stirred, creative abilities invigorated, premiums produced,, perspective developed and states of mind changed along the lines of achieving the premise for instruction. The advantages of e-learning is that it reduces time and cash, upgrades image of the institution, advances ceaseless expert advancement of staff enhances the nature of education and makes adaptation more powerful.

Yakubu and Dasuki (2018) state that e-learning has created a shift from traditional to technological modes. E-learning is also called Web-based learning, online learning, distributed learning, computer- assisted instruction, or internet – based learning. Historically, there have been two common e-learning modes; distance learning and computer assisted

instruction: Distance learning uses information technologies to deliver instruction to learners who are at remote locations from a central site. Computer assisted instructional (also called computer – based learning and computer based training) uses computer to aid in the delivery of standard multimedia packages for learning and teaching .According to wikipedia ,Accessibility refers to the user's ability to find what is needed. Improved access to educational materials is crucial as learning is often an unplanned experience. Updating electronic content is easier than updating printed material, e-learning technologies allow educators to revise their content simply and quickly. Learners have control over the content, learning sequence, pace of learning, time and often media which allows them to tailor their experience to meet personal learning objectives.

E-learning technologies permit the wide-spread distribution of digital content to many users simultaneously anytime and anywhere. An additional strength of e-learning is that it standardizes course content and delivery, unlike for instance a lecturer given to separate sections of the same course. Automated tracking and reporting of learners activities

lessen faculty administrative burden. Moreover, e-learning can be designed to include outcome assessment to determine whether learning has occurred." E – Learning technologies offer educators a new paradigm based on adult learning theory, which states that adult learn by relating new learning to past experience. Evidence suggest that e-learning is more efficient because learners gain knowledge, skills and attitudes faster than though traditional instructor led methods. The efficiency is likely to translate into improved motivation and performance. E – learning have demonstrated increased retention rates and better utilization of contents, resulting in better results.

E – Learning: Historical Overview

As the origin of the word e-learning is not certain, it is proposed that the term probably originated during 1980 (Moore, et al 2011). In this digital era, e-learning is becoming more visible and approachable. What once was just computer based training now become “Take your class anywhere you go” E-learning can be considered as natural evolution of distance learning, it has always taken advantage of the modern technology

to develop and adapt the framework of educational tool for shaping education (Sangra, et al, 2012).

E–learning has its origin from mail learning method through correspondence courses, Sir Isaac Pitman's mail causes used shortened technique to teach in 1840. It has been the first distance learning course. The concept remains the same throughout the history, but medium multiple as the technology developed (Horton, 2001). Evolution of distance learning can be described as an inconsistent pedagogy method which was unconventional, conventional and new communication medium to deliver instructional material without any geographical constrain. Since distance education began its course, authors and academic have diverse definitions for it. content delivery format for distance education have taken various forms such as mail delivered instructors, materials in print format, classes over electronic medium, via mobile devices and now, virtual classes (Moore, 1990). Distance education has been around for countries, but it was only since 1960, E-learning has started to evolved, it influenced its way over corporations,

academic institutions, in training and in military (Fletcher and Rockway, 1986).

Sidney Presseg's concept of teaching machines emerged in 1920's. it was only later in 1950's it was widely popularizes by the works of B.F skinner's. as the cumulative demand for education cannot be met by building more schools and teachers, the direct programmed instruction to their students. Later in 1980, the era of personal computers began which paved the way for e-learning. Over the past 50 years a number of new approaches have been in practice to aid the instructor's role in the classroom (Benjamin, 1988).

It was until 1960 however that the first computer based training program or (CBT program) was known as PLATO programmed Logic for Automated Teaching Operations. It was originally designed for students attending the university of Illinois but ended up being used in schools throughout the area.

While the term E-learning was first used in October 1999 at a CBT systems seminars in Los Angeles, the idea behind the word dates back to

a much earlier time in history. For e-learning to emerged as a new and exciting form of learning, it core element had to be found and established as an integral part of our lives. This has happened with the inventions of reading and writing, the establishment of the profession of the teacher, the invention of the printing technology and of course, and the development of electronic technology. Basically we can see that behind this relatively new medium, there are decades of revolutions and inventions in learning and teaching that paved the way to E-learning. So let's have a look at the most significant moment of E-learning-learning development.

FROM EARLY STAGE

THE RISE OF THE MACHINE

The machine – assisted learning, however is much more similar to the idea. The first step towards that was the invention of the teaching machine by Sidney Pressey. He was an educational psychology professor at Ohio University in the early 1920s. He invented a machine that looked like a typewriter and was used for answering multiple choice questions. The machine had a window with a question and for answer. The students

had to press one of the four keys to give the right answer. So it was able to tell the learner if they were right or wrong and was considered to be the first demonstration of how a machine can teach unfortunately the Pressey machine was not successful at the time it was introduced. The evolution and teaching were introduce. The educational world was not ready for the evolution and teachers were afraid that they might lose their job if the machine was widely introduced.

There is also the issue of employees having hunt down the proper equipment in order to watch the video. These videos often had a limited interaction which lead to the interaction which lead to the nearly impossible task of racking progress and assessment (Cooke, 2004). Since it was obvious that videos was not the best solutions, a new form Koo kids of training evolved, CBT or computer based training.

Window 3.1, Macintosh, CD-ROMS, PowerPoint marked the technological advancement of the multimedia era (Kiffmayer, 2004). CD ROMS could be cheaply produced so that the problem of checking in or out videos was eliminated. Employees could also be able to simply put in

a CD to their personal computer at their desk and complete the training. One of the first innovations in actual e-learning was the learning management system. The first management system (LMS) offered off the shelf platforms for front – end registration and course cataloging and they tracked skills management and reporting on the back – end (Clark and Heaney, 2003). This enable schools and companies to place courses

Definition of E- Learning

Aparicio (2016) claim that e-learning concept was not the first term to be used in conceptualizing the use of computerized systems to enable or facilitate the learning process. They identified 23 concepts that belong to the use of computers for learning purposes (e.g online learning, virtual learning, distance education, m-learning, MOOC, learning management system). E – learning should not be confused with the concept of blended learning, which is defined as the effective integration, fusion, even of face to face and online learning depending on the educational need and purpose. Sangral (2012) found four general categories of definitions of e-learning.

- Technology driven; Use of technology to deliver learning and training program.
- Communication-Oriented: Learning facilitated by the use of digital tools and content that involves some form of interactivity which may include online interactions between the learner and their teachers or peers.
- Delivery – System Oriented; The delivery of the learning training or education program by electronic means.
- Educational – Paradigm – Oriented: information and communication technologies used to support to improve their learning.

Rodrigues (2019) define e-learning as an innovative web-based system based on digital technologies and other forms of educational materials whose primary goal is to provide students with a personalized, learner – centered, open enjoyable and interactive learning environment supporting and enhancing the learning processes.

Garrison (2017) claims that e-learning is a descriptive technology that is currently transferring how learning is approached in an educational context. Dron and Aderson (2015) identified four generations of e-learning pedagogies. The behaviourist, cognitivist, the social constructivist, the connectivist, and the holistic generation, the relevance of each pedagogical approach depends on technological capabilities that it uses. The holistic generation includes learning analysis collective technologies, deep learning and artificial intelligence disaggregated tools and services, mobility and device diversity, the internet of things and ubiquitous computing virtual and augmented reality, the 3D printing, the characteristics of this next generation of pedagogies are:

a. Student – centered
b. Distributed technically, socially and organizationally
c. Crowd – driven support and emerged
d. Integrated just in time and authentic
e. Courses will play a less significant role
f. Learning will be separated from accreditation

E-LEARNING ADOPTION IN NIGERIA INSTITUTION:-

Readiness of learners

According to the works of Nwokolo Sunday Anthony, Solomon Allu, and Garba Mohammed Rabiu (2017) asserted that E-learning began in Nigeria's tertiary institution with the storing of prepared lecture materials in CD-ROMS that can be played back later when the need arises Adult et Al (2013) states that the most institutions adopted the internet in order to improve the delivery of this services but could not maintain the internet facilities because of high cost of powering the computer systems in the absence of public power supply which normally force he students to go to public internet cafes. This also comes with the challenge of low bandwidth, which made it impossible for the students to stream interactive lectures real time. Despite these earlier drawbacks, some higher institutions of learning such as ObafemiAwolowo University, ILE-IFE and Federal school of surveying actually set up E-learning facilities.

According to the works of Nwokolo Sunday Anthony, Solomon Alliu and Garba Mohammed Rabiu (2017) Explained that Nigerian

university face a lot of challenges in implementing E-learning. According to Resnick (2002)cited in Oye et Al (2010) the approaches to teaching and learning must change before Technology introduction could be of any benefit to both the Learners and teachers. Lack of specialized and social aptitudes required for execution of e-learning establishment using the University of Abuja, Nigeria as a case point, Anene (2014) studied the problems and prospects of e-learning in Nigerian universities by specifically examining availability of e-learning materials and to ascertain if student make use of e-learning in their studies. They found that one of the obstacles to the use of ICT was infrastructure deficiencies, the students lamented that Nigeria universities do not have adequate e-learning library domain, online seminars or discussion with lecturer, online examination and limited bandwidth. Implicit of this study was of Nigeria University (ASUU) to force government to correct abnormalities. Chiaha (2013) explicitly studied the kind of e-learning facilities that students have access to; the percentage and extent students access these facilities as well as the factors that hinder students from accessing e-

learning facilities; most students have access to only e-mail accounts and the factors hindering access to e-learning facilities include electric power supply, poor network connection, among others (Chiacha, 2013). Atsumbe (2012) investigated the availability and utilization of e-learning infrastructures in a Nigeria university. Their specific objectives were to investigate the adequacy of e-learning infrastructure for effective teaching and learning; the proficiency of e-learning infrastructures to facilitate enhanced lecturer- student teaching and learning interactions and the factors that inhibit the use of e-learning infrastructure. The findings revealed that there were inadequate facilities specifically directed towards teaching and learning and the e-learning infrastructure available is largely for administrative use. Although lecturers and students have access to computers, laptops and internet facilities, thay are not used for teaching and learning.

Aboderin and Kumuyi (2013) looked at the problems and prospects of e-learning in curriculum development and implementation in secondary schools in Ondo State of Nigeria. Specifically, they examined the

availability of e-learning tools for curriculum implementation, the extent to which it was applied by teachers, strategies and prospects of e-learning in secondary schools. The finding revealed that there were shortage of e-learning tools and the few ones used were not adequately used. On the strength of these, the investigators advised governments to embark on massive in service training and retraining (seminars, symposia, workshops and conferences) for teachers and how to operate computers. Similarly, (Aboderin (2015) investigated the challenges and prospects of e-learning at the National Open University of Nigeria and while the study recognized that e-learning influences students ICT competence, it found that the major challenges included lack of enough computers, shortage of internet facilities, student's lack of access to e-learning facilities and tools, high cost of software and erratic power supply.

Concept of Biology in Education

In order to be able to understand the concept of Biology education, it would be necessary to look at the definitions of Biology education in past and present time. This is because technology has helped to changed

definitions of certain things. Biology as the branch of science subject that deals with the study of living things, it is one of the prerequisite subject in the field of learning that contributes immensely to the technological growth of the nation, for example the knowledge of Biology is useful in the following areas such as medicine, manufacturing and processing industry, food production, pharmaceuticals, biotechnology among others (Fatoba and Abidakun, 2019).

The modern tendency tends towards cross disciplinary research and the unification of scientific knowledge and investigation from different fields has resulted in significant overlap at the field of Biology with other scientific disciplines.

Biology according to Alane (2020) is a natural science that involves the study of everything that is, or was once alive whether it's plant, animal or micro – organism. According to Wikipedia, the word "Biology" is derived from the Greek word "Bios" (meaning life) and "logos" (meaning study of). According to Wikipedia, Biologist studies the structure function, growth, origin, evolution and distribution of living

organism. Biology recognized the cell as the basic unit of life, heredity and evolution as the engine that propels the creation of new species. Living organism are open systems that survive by transforming energy and decreasing their local entropy to maintain a stable and vital condition defined as Homeostasis (Britannica Encyclopedia of learning,2014.

According to Frederick (2010) the four principles that unify modern Biology include.

5. Cell theory
6. Gene theory
7. Homeostasis
8. Evolution

Cell Theory: The principle that all living things are made up of fundamental units called cells and all cell come from pre – existing cells.

- Gene Theory: The principles that all living things have DNA molecules that code the structures and functions of cell and get passed to offspring.

- Homeostasis: The principle that all living things maintain a state of balance that enables organism to survive the environment.
- Evolution: The principle that describes how all livings can change to have traits that enable them to survive better in their environments, these traits that enable them to survive better in their environments, these traits result from random mutations in the organisms sense that are selected. During natural selection organisms that have traits better suited for their environment have higher rates of survival and then pass those traits to their offspring.

Theoretical Framework

Educational Theories About E-Learning.

The Theory of Acceptance Model (TAM).Researchers have developed different models to predict and explains the beliefs of teachers regarding the use of digital technologies in their teaching practice. One of these models is TAM, which aims to explain the factors that influence the users of technologies. Bogozzi, R.P (1992) TAM considers two beliefs related to the adoption of technologies; on the one hand, the perceived

ease of use that is, the personal belief that the use of specific technologies will reduce the effort made to complete a task and, on the other hand, the perceived usefulness which is the personal belief that the use of technologies will improve professional performance. This model has been used in multiple studies and it was shown that these perceptions explain a relevant part of the variance in the intention of use and attitude towards digital technologies, Chang, C-T (2017).

The second most frequent term in the studies e-learning in the analyzed period was structural equation. Modeling (SEM), this statistical methodology allows through hypothesis testing, confirming a structural theory related to an educational phenomenon. This theory represents a casual process derived from multiple variables that are analyzed through regression equation and graphically represented with the aim of clarifying the studied theory. The theoretical model can be statistically verified in a simultaneous analysis of the entire system of variables to establish the degree of coherence with the data, Byrne, B.M (2016). In the analyzed articles, there are two preferential uses of SEM:

1. Confirmation of theoretical model in non experimental research, where other methods to examine the validity of the theories are not well developed and
2. The study of the validity and reliability of instruments of instrument used to measure e-learning.

Logic regression is a statistical method used in empirical studies that involves categorical (DICHOTOMIC) dependent variables. NIU (2020) states that although logical regression is an efficient tool to understand correlational relationships, some of the result reported in educational investigations based on logistic regression results might not be accurate and should be interpreted with caution.

New Technologies in Biology Education

E-learning Environment: The Wikipedia free Encyclopedia (2012) identified some quality classroom delivery to include: computer in the classroom, classroom web site, class blogs and wikis, wireless classroom microphone, mobile Devices and interactive white board. These technologies interact with the teacher in a friendly manner as to motivate

students into learning achievement. Also other technologies geared towards enhances learning achievement of students are now available. These are in hardware and software forms and include: learning; learning software in different areas of Biology, IPod, CD, ROMs, Moderns, Laser printers You-tube, software, digital cameras, digital scanners, e-How (2012).

According to Wikipedia, the electronic environment now in vague has necessitated the need for electronic teaching infrastructure. A prominent tool is the tool smart board which commands respects as it eases the use of multimedia and greater interactivity. A significant and unique feature of the smart board is that it all allows teachers or instructors to make illustration of those Biology concepts that hitherto were difficult to the illustrated.

TECHNOLOGICAL CHANGES IN BIOLOGY ON INSTRUCTION AND PRACTICE

According to Nwoji (2012), Technology could be defined as the application of the scientific method to solving problems in our daily life.

Technology is the application of scientific method to solving problems regarding impartation of skills to learners to meet the changing needs and demands of the society, new technological devices as resources in the Biology laboratory activities are redefining Biology education knowing what and how to use these devices is a very vital part of scientific knowledge both on the part of the teachers and their students. The strength of the new technological devices have been recognized as they have found it provided students with huge quantities of up to date information in new technologies for Biology activities in the laboratory."And as Biology itself assumes an increasing prominence among sciences," Biologist are realizing that their responsibilities have changed. They must produce not just the doctors and research scientist of the future but also a biologically literate citizenry.

The introduction of electronic laboratory is becoming a reality as new computer programmes gain the ability to mimic laboratory experiences a trend exemplified by the interactive lab manual. These

devices are specific media of instruction, which have both visual and audio appeal. They have great utility in making things clear to students.

The utilization of these new technological resources will not only help in changing the ambience in the Biology laboratory classroom, but will also provide opportunities to engaged students in critical thinking and problems solving; opportunities to enhance the educational value of the activity; stimulate the desire of students to learn; reasoning skills needed to acquire and apply new information throughout their lives.

One feature of the technologies that foster electronic learning is the ability to provide new ways of teaching students about writing practical / research reports, working in groups and acquiring scientific ethics, the use of interactive computers / videodisc with laser player and colour TV monitors, micro-computers based instruction and computer assisted instruction has been very helpful in forms of drills and practice in Biology activities (e.g dissection of animals etc) .The students generally have positive attitude towards new technological devices and frequently showed gains in academic self-confidence. In all new technological

devices such CD-ROMs, Video disc/tapes, computers interactive videos, internet etc present great possibilities for solutions of tasks in Biology laboratory activities; making the laboratory experiences for students exciting and adding new productivity dimension.

All these are gleaned from the work of NkadiOnyegegbu (2008),One feature of the new technologies in Biology laboratory activities is the linking of microcomputers to other new technologies such as laser videodisc player, thus extending the realm of traditional CAI to what is now called computer based instruction (CBT). Interactive videodisc instruction, the use of video disc player linked to a computer is one state of an art form of CBT in which:

- The computer provides the means for interaction between the learner and the instructional content and
- The videodisc player provides life-like images in which learners can respond and are of much higher resolution than those possible on a typical computer screen.

A good illustration of this is the use of microcomputer or video disc tape player in the Biology laboratory activities such as :-

1. Circulation of blood in humans
2. Incorporating digital photographs taken from various laboratories demonstrations such as DNA gets into a series of tutorials that students use to learn basic biological concepts;
3. Unfolding of a flower bud captured with a powerful lens camera connected to video disc player;
4. Reproduction in animals, tropical in plants , osmosis, diffusion;
5. Making behavior in animals
6. Erosion activities polluted waters and streams
7. Culturing of bacteria, etc.

We are in an era of technological devices that is revitalizing the Biology education and thereby facilitating the teaching and learning and bringing out the realities of the subject to the students.

Delivery of Instructional Via E-Learning

According to Claudia and Popa (2008), E-learning could be applied in instruction as follows:-

a. Computer-Based Training (CBT): Computer Based Training (CBT) is any course of instruction whose primary means of delivery is a computer. A CBT courseware may be delivered via a software product installed on a single computer, internet website. All that is needed is a computer, a projector, scanner and multimedia objects such as audio, video and speakers for the transmission of learning contents or it could be delivered over the internet as web-based training. Teachers can use CBT to teach students because it is especially good for keyboarding, word processing, information management, and other subject area.
b. Web – Based Training (WEBT) is an innovative approach to learning in which Computer Based Training (CBT) is transformed by the technologies and methodologies of the World Wide Web, the internet and intranets (Kilby, 2009). Web – based training could be

used to present contents live and in a structure promoting self directed and self faced instructions on any topic ay any distance. WBT could also be used in the provision of remedial lesson to students. The teacher can also use it 134 for evaluation and assessment of the students objectively.

c. Collaborative Learning: This is the online learning based interaction with others learners/instructors (Siadaty and Ta ghiyareh 2008). E – learning particularly gives room for collaborative and students-centered learning. When using e-learning technology in classroom all the teacher does is to guide the learners in a virtual classroom environment, through interactive online learning such as shared whiteboards, shared application software, chat functionality and audio/video over the network (Brown, in Ojeaga and Igbenedion, 2012).

d. Informal E-Learning: E-learning can also help to facilitate informal learning in school program through internet and e-learning, the students can learn outside the subject based materials, traditional

classroom and can learn about other important things that affect their lives students also have the opportunity to learn during holidays and vacations without necessary being taught by his teacher.

Challenges and Constraint to Effective Utilization of E-Learning Technologies and Quality Assurance in Biology Education

E-Learning technologies development is faced with a lot of challenges in Nigerian universities. One of these challenges is inability of lecturers to assist the students develop the ability and knowledge necessary to make them use the e-learning effectively. In many e-learning prospects, students face some challenges of bad perception during their studies. Lack of pedagogy in their curriculum, lack of user touch and feel in their e-learning platform. Also, some e-learning studies conducted in developing countries show lack of vision and from work in implementing e-learning lead to failure of these e-learning project (Pal, 2006, Kizito and Bajan, 2008). Lack both technical and social skills required for the implementation of e-learning contributes to failure of e-learning projects.

Four obstacles affecting the total implementation of e-learning in developing countries are;

1. Connectivity: limited or lack of connectivity in many developing countries including Nigeria universities impede access to online learning e.g (E-learning).
2. Equipment: E-learning requires equipment that can facilitate learning but in some of Nigeria universities the equipment such as computers, digital technology and internet are not available for proper utilization.
3. Software: software enable educators to design and develop learning content, these software are costly and not available for use in some of our universities to facilitate e-learning program.
4. Training: No combination of connectivity, equipment and software will achieve anything if people are not trained to use then (Daniel, 200.

Equipment: This affects e-learning programs in universities. According to Bibiana Ngozi, Nwabufo,Titus, AmodiUmoru, Johnathan Omoniyi Olukotun(2018) The challenges of students in e-learning classes are;

i. Hardware's used for e-learning classes are costly and some universities cannot afford it.
ii. Inadequate supply of electricity to e-learning centres for effective teaching and learning.
iii. Inadequate funding of the universities to buy e-learning technologies.
iv. The cost of a personal computer (PC)and laptop are still very high in Nigeria considering the income level of an average worker in the country .Few students that are privileged to have a PC/ Laptop are not connected to the internet as this do attract extra cost which they cannot afford.
v. Software and License cost:it is very expensive to get some of the softwares because they are not developed locally, they are developed in Europe and other developed countries to suit their

own system and make their own living. The cost and even the interpretation of some of the software's put off some of the students who showed interest.

vi. Technophobia: Most of the student have no computer education background ,hence they are afraid of operating one.

vii. Attitude of students:ICT give room to independent learning and most students are reluctant to take responsibility for their own learning, but preferred to be spoon-fed fed at all times.

Benefits of Utilization of E-learning in Tertiary Institution Education program

E-learning is beneficial in several ways because it meets the diverse needs of students, by providing support to differently abled persons, engaging learners who do not respond well to conventional educational settings, providing opportunities to enhance learning by the gifted and talented learner, and by developing independent learning skills through professional learning experiences (Malale, Gomba&Dichaba, 2018; Meskhi, Ponomareva&Ugnich, 2019). Most especially, by enabling self-

study at one's own pace and personalized learning, e-learning helps older learners overcome the learning challenges posed by physical disabilities and coping with one's numerous roles as an adult (Chu & Tsai, 2009). It also enhances face-to-face interactions during teaching and administration in HEIs, and creates room for integration into the work place (Ibezim, 2013; Malale, Gomba&Dichaba, 2018). With respect to lifelong learning, (Casquero, Portillo, Ovelar, Benito &Romo, 2010) view e-learning as being capable of making learning a proactive.

- It promotes active and independent learning; Efficient way of delivering courses as resources are available from anywhere and at any time;
- Student can interact with their peers from all around the world through group discussions and private chats; the studying materials can be accessed unlimited number of times.
- Students are more engaged and able to develop 21st century skills. Teachers have a more positive attitude towards their work and are able to provide more personalized learning family interaction and

parental involvement may increase. Communities benefit from bridging the digital divide.

- The quality of education can be improved with the implementation of an e-learning system, for instance, e-learning multimedia instructional delivery modalities potentially hold limitless benefits for students and the learning process it serves.
- As a useful tool for improving quality teaching and learning (Coopasan, Knight and Pete, 2017) by increasing the teachers.

Motivation to teach and students motivation to learn (Bates, 2009) and by playing the crucial role of preparing a new crop of teachers to meet twenty – first century pedagogical expectations (Oye, Salled and Lahad, 2011).

Indeed, the literature is replete with numerous benefits of e-learning that can be derived by individual learners, the university and governments as well. According to Wikipedia, It is claimed that e-learning ensures the following; greater access to information, better communication; increased co-operation; increased co-operation and

collaboration; synchronous learning; improved pedagogy through stimulations; virtual experience and graphic illustrations (Aboderin, 2015; Bates,2009); diversity of lectures enhancing students active engagement and learning and impacting – academic goal achievement (Aminu and Rahanco, 2014, Mao, 2014)13, and by helping to meet the needs of the knowledge based economy (Bates, 2009).

Review of Empirical Studies

Previous reviews about educating research on e-learning allows observing the evolution of this study theme in the scope of educational technology. Regarding the methodology applied in reviews, it is important to highlight them except for the study conducted by Zare (2016) none of then reputed the applications of the PRISMA protocol in their development. Pedagogical technical,organization and socio-cultural. In the period of 2002, 2004, studies in this field are characterized for making a general description of the concept of e-learning and its practice within a large variety of aspect. In a second phase (2007-2008), the research themes were reduced, and studies were oriented towards the technical

aspects of e-learning in its educational application; systems and models cases studies and teaching and learning strategies, among other shih (2008) carried out an SLR about trends in the research about cognition and e-learning (2001-2005) from a selection of five sources indexed in SSCI (social sciences citation index) within the scope of educational technology, they analyzed a total of 444 articles identifying several categories (motivational) information processing instructional approach learning environment prior knowledge metacognitive and cognitive –psychological characteristic). The most researched themes were learning environment – interactive learning environment, instructional approach – collaborative learning and meta-cognition – perception and awareness.

Rodrigues (2019 focused the concepts of e-learning and education in the ABE-inform and EBSCO data bases. For the analysis of the data, they used text mining software. As in our study, these tools specialized in the analysis of texts prove to be essential for a quality SLR. The identified dimensions were education (educational technology trends, online tools and social media) learning issues (innovation in educational fields,.Online

platforms and learning styles).Student, behavioral issues, engagement satisfaction and motivation) and usability, distance learning, e-learning systems, and learning analysis). Maurer and Khan (2010) conduct an SLR about a selection of five – scientific journals and two conferences with the aim of identifying the trends in the research on e-learning in the period of (2003-2008). They used the CLUTO software (graphical application for clustering data sets in order to carry out a scientometric and content analysis. The identified categories were instructional/educational technology, instructional process, teaching /learning perspectives, instructional methods, delivery system, instructional development, production variables, learn, learning environment evaluation culture and teacher, Oncu and Cakir (2011) identified four priorities the research about online learning environment.

1. Enhancing learner engagement and collaboration
2. Promoting effective facilitation
3. Developing assessment technique's
4. Designing faculty development program.

These areas are directly related to the dependent variables that should be the object of study in the research on e-learning, learner achievement learner engagement and learner retention. In this prospective, we observed a coincidence with the reassures of your SLR, which identified these variables as concepts that have been objects of study in the analyzed publications of the period of 2009 – 2018. Furthermore, all the priorities are reflected in our nodes and sub nodes with regard to the research methodologies, these authors defend the following methodological approaches; formative research claimed to improved the instructional design and all the curricular components), development research, experimental research and activity theory. Zare (2016) used five database of scientific publication and the focus of their review was the identification of studies about e-learning and MCDMC (Multi-critical decision making), which is an efficient approach for evaluating multiple criteria. As a result the following critical in e-learning evaluation were identified usability, response time, interactivity, web and course design,

accessibility, reliability, cost – effectiveness, functionality, security, stability trust accuracy flexibility, interoperability and continuity.

As condition for the success of online education, it is fundamental to promote an educational research line that develops ancient pedagogic designs that facilitate the learning of competences.

Summary of Reviewed Related Literature

The world a global village, the present age of technological advancement has brought changes into virtually all human endeavors including the teaching and learning processes. Acquisition of computer literacy skills as well as good face – value certificate in ICT Education is a sin-qua non for all and sundry. This is also the ease for the Nigerians promotion in places of works and securing a well – paid job are all attached to computer literacy, hence, the society should get more enlightened through ICT Education.

Furthermore, a lot of problems were also adjudged to have hindered the effective utilization and applications of E-learning in teaching Biology

Education in our schools such problems include; poor perception and conservative attitude of lecturers on the use of e-learning technologies for instructional delivery, shortage of qualified staff with capacity in e-learning application lack of trained and retraining of staff and students in e-learning technologies and applications and inadequate facilities and infrastructure for e-learning and instruction and applications together with poor management and maintenance of available resources for e-learning training and practice. The review also revealed that some strategies utilization and application of e-learning in teaching / learning of Biology education of the programme; such as teachers enhance salaries, adequate power supply, government funding and procurement for e-learning tools, government intervention into e-learning school curriculum, provision of e-learning tools, facilities, techniques and infrastructure, provision of enough computers.

CHAPTER THREE

METHODOLOGY OF THE STUDY

This chapter focuses on the methodology that was adopted in carrying out the research under the following sub-headings;

- Design of the Study
- Population of the Study
- Sample and sampling Techniques
- Instrument for Data Collection
- Validity of the Instrument
- Reliability of the instrument
- Method data Collection
- Method of Data Analysis

Design of the Study

The survey research was used for this study, in that data were collected primarily from sampled population of the target population through the administration of questionnaires, the finding from descriptive

survey design used to make generalization about population of the study. According to Osuala (2010) descriptive survey gives that accurate assessment of the characteristic of while population of people. It is also realistic than the experimental design in that is investigate phenomina in their natural setting.

Population of the Study

The population for this study consist of 200, 300 and 400 level student of Faculty of Education in the university of Benin City.

Sample and Sample Techniques

The sampling techniques adopted for this study is the simple random sampling. The simple random sampling technique was used in order to ensure fair and equal chance of representation of the total population. The sample of this study will be a selection of 100 students from the entire population.

Instrument of Data Collection

The research instrument used in this study is questionnaire in the process of data collection, the researcher will use structured questions whereby respondents will choose or tick on the availability option that best experiences their opinion, the questionnaire is divided into 2 (two) sections.

Section A – consist of a requested bio data from respondents.

Section B: consist of 20 (twenty) items that will address the 5(five) research questions raised to assess the availability and utilization of E-learning technologies in Biology Education program in university of Benin. The questionnaire was weighed on a four point scale responses of strongly agree (SA, 4 points), agree (A, 3 points) disagree (D, 3 points,) Strongly disagree (SD, 2 points), disagree (D,1 points). The decision or benchmark for the study is 2.5.

Validity of the Instrument

The instrument was appraised, scrutinized and validated by my project supervisor and two other lecturers from the Faculty of Education (Department of Curriculum and Instructional Technology) in the University of Benin, who are experts in their field of study. Their criticism, suggestion and recommendations are incorporated into the final draft of the instrument.

Reliability of the Instrument

To determine the reliability of the instrument drafted, copies of the instrument were administered to the selected samples which comprise 20 students of Biology Education Curriculum and Instructional Technology Department and this was repeated after a week to the same subjects Pearson Product Moment Correlation was used and the reliability co – efficient of 0.669 was obtained.

Method of Data Collection

The questionnaires were administered personally by the researcher. The questions were carefully explained to the respondents by the researcher who stayed to give assistance to respondents who has some difficulty. The questionnaire were collected as soon as they were completed.

Method of Data Analysis

In the analysis of this study mean and standard deviation will be used to determine whether the response to an item is positive or negative, items were classified both as positive or negative attitudes usings the mean rating of 2.5 for decisions for the four point scale of

Strongly Agree (SA)	4
Agree (A)	3
Disagree (D)	2
Strongly Disagree	1
Summation	= 4 + 3 + 2 + 1 = 10

Average = 10/4 = 2.5

Items with 2.5 and below mean values were regarded as negative while items with 2.5 and above values were regarded as positive responses.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

In this chapter, results obtained after data analysis is presented and finding are discussed.

Research Question One: What is the extent of availability of e-learning technology for teaching Biology in university of Benin.

Table 1: Basic statistics of the extent of availability of e-learning facilities for Biology Teaching

S/N	Item	N	Mean Score	Test Value	SD	Decision
1	We have projectors in our Biology lecture halls for the teaching of the course	100	2.5800	2.5	0.99676	Agree
2	We have online platforms for communicating with our lecturers and friends	100	2.8000	2.5	0.91010	Agree
3	We have Biology slides for learning of the course.	100	2.7600	2.5	1.01623	Agree

From Table 1, the mean score of approximately 2.58, 2.80 and 2.76which are higher than the text value of 2,5 were obtained for item one 1, 2 and 3 respectively and standard deviations of approximately 1.00, 0.91 and 1.02

were also obtained for item 1, 2 and 3 respectively. It therefore means that University of Benin Biology students agreed that they have projectors in their lecture halls for teaching Biology, they have online platforms for communicating with their lecturers and friends and they have biology slides for learning of the course. Therefore, to a high extent, e-learning facilities are available for the teaching of Biology in the University of Benin.

Research Question 2: What are the challenges encountered in the use of e-learning facilities in the University of Benin?

Table 2: Basic statistics of the challenges encountered in the used of e-learning facilities in the University of Benin.

S/N	Item	N	Mean Score	Test Value	SD	Decision
11	Most times we cannot access the online platforms due to poor connectivity	100	3.2600	2.5	0.81178	Agree
12	We find it difficult to access online platforms due to inability to acquire data	100	3.3000	2.5	0.78496	Agree
13	Teaching and learning are always disrupted due to power failure.	100	3.1300	2.5	0.89505	Agree

14	Most times our gadget are switched off due to non-availability of power supply in our area/school.	100	3.2700	2.5	0.90849	Agree
15	I am not efficient with the use of online platforms so I find it difficult to learn effectively.	100	3.5300	2.5	1.01956	Agree

From Table 2, mean scores of approximately 3.26, 3.30, 3.13, 3.27 and 2.53 which are higher than the test value of 2.5 with these corresponding standard deviations of approximately 0.81, 0.78, 0.90, 0.91 and 1.02 where obtained for items 11, 12, 13, 14 and 15 respectively. It means that University of Benin Biology students agreed that they cannot access online platforms due to poor connectivity and inability to acquire data. They also agreed that teaching and learning are always disrupted due to power failure and that most times, their gadgets are switched off due to power outage in school or their residence. More so, some of them also agreed that their inefficiency in the use of online platforms makes it difficult for them to learn effectively.

Research Question Three: What are the benefits of the use of e-learning facilities for learning in the University?

Table 3: Basic Statistics of the Benefits of the use of e-learning facilities

S/N	Item	N	Mean Score	Test Value	SD	Decision
16	E-learning makes students easily access learning materials	100	3.5300	2.5	0.65836	Agree
17	With e-learning, I find it easy to find solution to understand biological contents	100	3.4600	2.5	0.72995	Agree
18	E-learning enhances effective communication between lecturers and students	100	3.3800	2.5	0.82609	Agree
19	The use of E-learning motivates us to learn	100	3.2900	2.5	0.85629	Agree
20	The use of E-learning sustains our attention in class	100	3.2400	2.5	0.76700	Agree

From Table 3, mean scores of approximately 3.53, 3.46, 3.38, 3.29 and 3.24 which are higher than the text value of 2.5 were obtained with their

corresponding standard deviations of approximately 0.66, 0.73, 0.83, 0.l86 and 0.77 for items 16, 17, 18, 19 and 20 respectively.

It means that University of Benin Biology students agree that e-learning makes them easily access learning materials, find solution to biological contents, enhances their effective communication with their lecturers, motivates them to learn as well as sustains their attention in class.

TEST OF HYPOTHESES

Hypotheses One: Biology lecturers do not significantly utilize internet facilities in relating academic issues with their studies in the University of Benin.

Table 4: One Sample Statistics of Utilization of internet facilities in relating between lectures and students.

	N	Mean Score	SD	Test Value	t	df	Sig (2 – tailed)
Relationship between lecturers and students	500	2.3000	0.99799	2.5	-4.481	499	0.000

From Table 4, means core of 2.30 which is less than the test value with a corresponding standard deviation of 0.998 was obtained. Also, the p-value

of 0.000which is less than 0,05 Alfa level of significant was obtained. It therefore means that Biology lecturers significantly utilize internet facilities in relating academic issues with their students in the University of Benin. Hence, the null hypothesis is not retained.

Hypothesis Two: Biology lecturers do not significantly utilize e-learning facilities in lecture delivery in the University of Benin.

Table 5: One Sample Statistics of the Utilization of e-learning facilities in lecture delivery in the University of Benin

	N	Mean Score	SD	Test Value	t	df	Sig (2 – tailed)
Utilization of e-learning	200	2.9050	0.86004	2.5	6.660	199	0.000

From table 5, mean score of 2.91 which is higher than Test value if 2.5 with its corresponding standard deviation of 0.86 was obtained. Also, p-value of 0.000 which is less than the 0.05 Alfa level of significance was obtained. It therefore means Biology lecturers significantly utilizes e-learning facilities in lecture delivery in the University of Benin. Hence, the null hypotheses is not retained.

DISCUSSION OF FINDINGS

The results of this analysis is based on the opinion of the respondents on level of assessing availability and utilization of e-learning technologies in biology education program in university of Benin has been quite instructive, informative and revealing..

From research question one, revealed that university of Benin Biology students agreed that they have projectors in their biology lecture, they have online platforms for communicating with our lecturers and friends and finally they also strongly agreed that biology slides are provided for learning of the course. The mean scores of approximately 2.58, 2.80 and 2.76 which are higher than the text value of 2.5 were obtained for terms 1, 2 and 3 respectively and standard deviations of approximately 1.00,.91 and 1.02 were also obtained for item 1, 2 and 3 respectively.

Therefore to a high extent e-learning technologies are available for the teaching of biology in university of Benin.

The findings for research question two taking item 11, 12, 13, 14, 15 which mean scores of approximately 3.26, 3.30, 3.13, 3.27 and 2.53 which are higher than the test value of 2.5 with their corresponding standard deviations of approximately 51, 75,. 80, 91 and 1.02 were obtained for items 11, 12, 13, 14 and 15 respectively it means that university of Benin biology students agreed that they cannot access online platforms due to poor connectivity and inability to acquire data. They also agree that teaching and learning are always disrupted due to power failure and that most times their gadgets are switched off due to power outage in school or their residence which makes it more difficult for them to learn effectively.

The findings from research question three revealed that university of Benin biology students agree that e-learning makes them easily access learning materials find solutions to biological contents, enhances their effective communication with their lectures, motivates them to learn as well as sustains their attention in class.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

The study was carried out to assess availability and utilization of e-learning technologies in Biology education program in University of Benin. This chapter present a summary of the research work, conclusion and recommendation.

SUMMARY

This study was used to assess the availability and utilization of e-learning technology in Biology education program in University of Benin.

Literature review was organized under the following sub-heading:

In the course of conducting the study, five research questions were raised. They are: Concept of E-learning, Definition of e-learning, E-learning adoption in Nigeria institution: readiness of Learners, Concept and definition of Biology Education, Theoretical framework, new technologies in Biology education , Technological changes in Biology education on instruction and practice, Delivery of instruction via e-

learning, Challenges and constraints to effective utilization of E-learning Technologies and quality assurance in Biology Education, Benefits of utilization of E-learning in tertiary institution Education program, Review of empirical studies, Summary of reviewed related studies.

Five research questions and Four purpose of study was raised.

1. What is the extent of availability of e-learning technologies for teaching biology in university of Benin?
2. What are the challenges encountered in the use of e-learning facilities in the University of Benin?
3. What are the challenges encountered in the use of e-learning facilities in the University of Benin?
4. What are the benefits of the use of e-learning facilities for learning in the University of Benin?
5. Do Biology lecturers utilize e-learning failures in lecturer delivery in the University of Benin?

Since random sampling techniques were used to select 100 students from the entire population.

Questionnaire was the major instrument used for data collection. The questionnaire was made up of section ‘A; and section ‘B’ while section ‘A’ contained the demographic data of the respondents section ‘B’ was meant to elicit data on the various research questions raised and other matters considered important to the success of the study. The validity of the instrument was determined by the project supervisor and other lecturers from the department. The data collected were analysed using mean and standard deviation, while Pearson product moment correlation was used for reliability which yield 0.669 as the reliability

Conclusion

Following the analysis of data collected and discussion of the results, the following were the conclusion drawn from the major findings of this study.

- The findings revealed that university of Benin biology students have projectors in their lecture hall for teaching Biology, they have online platforms for communicating with their lecturers and that e-

learning facilities are available for the teaching of biology in the University of Benin.

- The analysis further found the challenges that hinder effective availability and utilization of e-learning technologies are poor connectivity and inability to acquire data, power failure, Moreso some of them agreed that their inefficiency in the use of online platforms makes it difficult for them to learn effectively.

  Finally, it was revealed that e-learning technologies makes them easily access learning materials, find solutions to biological contents, It enhances their effective communication with their lecturers ,motivates them to learn as well as sustains their attention in class.

Recommendations

With respect to the conclusion drawn from the findings, the government, administrators, private bodies, lecturers and the communities will still have to work together to make sure this recommendation salvage

the need for the availability and utilization of e-learning technologies in biology education program.

1. The Federal Government should integrate the use of e-learning under ICT in the lecturers work.
2. Lecturers in Nigeria should be motivated and encouraged to develop and use e-learning technologies such as multimedia courseware and software relevant to teaching and learning .
3. Internet services and computers should be adequately provided by government to various public institution to enhance the usage of the available e-learning technology.
4. Issue of electricity should also be improved upon since the e-learning technologies cannot function without electricity.
5. Furthermore the lecturers, should try as much as possible to create an online valid platform so that the students can communicate freely with them and thus find solutions to their problems as the case may by through the lecturers, for easy accessibility.

6. The guidance and counseling body of the school should also make it a matter of important to plan conference, workshops and seminars for students and lecturers on how to make learning effective through the use of online platform also known as e learning.
7. E-learning teaching and learning method should be adopted as it possess greater advantages in accomplishing the educational goals and objectives of the university.
8. The difference between E-learning and traditional method should be clearly stated and the advantages of e-learning exploited.

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DEPARTMENT OF CURRICULUM AND INSTRUCTION TECHNOLOGY
FACULTY OF EDUCATION
UNIVERSITY OF BENIN, BENIN CITY,EDO STATE

Dear Sir/Ma

I am a final year student from the above institution. This questionnaire is strictly academic purpose and it is designed to carry out a study on **"ASSESSMENT UTILIZATION of E-LEARNING TECHNOLOGY IN BIOLOGY EDUCATION PROGRAM IN UNIVERSITY OF BENIN".**

Please, kindly respond to the items sincerely as they are strictly met for academic purpose and they shall be treated with high confidentiality.

Thank you.

INSTRUCTION: Please tick(✓) in the boxes below

SECTION A: Fill the blank spaces

Department _____

Sex _____

SECTION B: kindly tick [√] the option that is applicable to you

Key: strongly agree (A); Agree (A); Disagree (D) strongly Disagree (SD)

S/N	Item	SA	A	D	SD
1	we have Projectors in our Biology lecture halls for the teaching of the course				
2	We have online platforms for communicating with our lecturers and friends				
3	We have Biology slides for learning of the course.				
4	All students have email address for accessing vital information from our lecturers				
5	Our Biology lecturers have email addresses through which we communicate Biology course content with them.				
6	Our lecturers often make use of emails in relating lecturers to us.				
7	Our lecturers download lecturers materials for us to access through online platforms.				
8	Our lecturers make use of projectors (s) in delivery of Biology lectures				
9	Our lectures make use of slides in teaching Biology				
10	We relate problems associated with Biology course content with our lecturers through email.				
11	Most times we cannot access the online platform due to poor connectivity				
12	We find it difficult to access online				

	platforms due to inability to acquire data				
13	Teaching and learning are always disrupted due to power failure				
14	Most times our gadget are switched off due to non-availability of power supply in our area/school.				
15	I am not efficient with the use of online platforms so i find it difficult to learn effectively				
16	E-learning makes students easily access learning materials.				
17	With e-learning, I find it easy to find solution to understand biological contents				
18	E-learning enhances effective communication between lecturers and students				
19	The use of E-learning motivates us to learn				
20	The use of E-learning sustains our attention in class.				