

**VIRTUAL LEARNING AS A METHOD OF TEACHING AND LEARNING IN
SECONDARY SCHOOLS IN MINNA, NIGER STATE**

BY

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2018/3/74348BT

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

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**A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF
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ABSTRACT

This study evaluated virtual learning as a method of teaching and learning in Secondary Schools in Minna, The study also ascertain virtual learning as a method of teaching and learning in secondary schools in Minna Metropolis, Niger State. . In order to carry out the study effectively, three research questions were asked and three hypotheses were formulated and tested. Many related literature were reviewed. The sample for the study consisted of 150 secondary school students and teachers, The researcher constructed the test items, which were then face validated by two experts in educational technology, The reliability of the instruments was determined using the test-retest reliability technique. The data collected on the two tests were correlated by using the Pearson Product Moment Correlation Analysis. The data obtained were analyzed. Mean and standard deviation were used to answer the research question. The hypotheses were tested with 0.05 level of significant. The findings of the research as seen in Table 1, 2 and, 3 shows that virtual learning will play a great role in improving the academic performance, and, thinking ability, of senior secondary schools in Minna, Finally, the limitation of study and suggestion for further studies were highlighted.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Learning is the part of human existence. Each day of a man's life, he learns new things to survive in a changing world. This is an informal learning in that as man interacts with his environment at any stage in time, he learns new things. But in a formal learning situation, learning starts at home in a cradle format, continues in the school, college, universities, workplace (Singh, 2011).

“Learning is breaking out of the narrow boxes that it was trapped in during the 20th century: teachers' professionalism, reflection and ingenuity are leading learning to places genuinely exciting to this new generation of connected young school students – and their teachers too”. In effect, virtual learning environments (VLE) are making students not to be confined to a particular building, or restricted to any single location or moment”.

A virtual learning environment (VLE) in educational technology is a web-based platform for the digital aspects of courses of study, usually within educational institutions. They present resources, activities, and interactions within a course structure and provide for the different stages of assessment. VLEs also usually report on participation; and have some level of integration with other institutional systems.

The school learning environment offers opportunities for teachers and students to come together for institutional teaching/learning process. In this learning process, various technological gadgets are employed to facilitate the process. Such advanced technologies

include internet, e-mail, website, mobile phone, iPod etc., (Mangal and Mangal, 2009). These advanced technologies are variable tools for rendering valuable assistance and good alternative to traditional method of education. This alternative could be in form of virtual classroom.

Virtual classroom has been described by Turoff (2007) as a web-based environment that allows an individual to participate in live training events without traveling to any other place. You can sit in the comfort of your environment and listen to lectures. You can participate in the lab exercises, ask questions and effectively interact with the teacher as if the action is taking place in a conventional classroom but it is done with the convenience of technological gadgets as desktop that have internet and phone connection. The internet on the other hand provides such advantages and new ways of communicating, interacting, and assessing information for both teachers and students.

Virtual learning instruction is the perfect solution to meeting the needs of life-long learners because it is available on demand, does not require travelling and has efficient cost. It is a good alternative for independent self-motivated students. Virtual learning uses computer software, the Internet or both to deliver instruction to students. This reduces or eliminates the need for teachers and students sharing a classroom (Van Beek, 2011). It launched in the 1980s when companies started using computer-based programs to train new employees. When Internet was invented, the practice began to grow in efficiency as companies could train new employees in remote locations, as well as chat with them online in order to answer questions. It cut cost and reduced the hiring of trainers. The main rationale behind the establishment of virtual learning is to prepare students as global citizens who can function and succeed across cultures and environments in an increasingly interdependent world

(www.world-globaleducation.edu/01/rationals.htm). Virtual learning environment is a system via the web through which materials for learning is delivered to students. These systems include assessment, student tracking, collaboration and communication tools. They can be accessed both on and off campus. They can support students learning outside the lecture hall at any time during the day (i.e. Morning, afternoon and night).

1.2 Statement of the Research Problem

The advent of Information and Communication Technology (ICT) gave rise to the institution of virtual learning. Information and communications technology have rapidly covered the whole nations of the world, improving the technological awareness of students and various individuals in their pursuit to acquire diverse knowledge to harness their professional dreams. With this explosive awareness of technological knowledge, the higher education environment is expected to expand focus on meeting students' expectations with more attention in widening the students' greater involvement in ICT. During the Covid-19 lockdown of 2020, secondary schools and other institution of learning were completely shut down which makes many of these institutions to switch into other method of teaching and learning. It is through this ICT that students develop lifelong learning skills that would enable them cope with emergencies of new disciplines and increased utilization of technology in learning.

Virtual learning overcome many drawbacks of the physical environment such as time, facilities, location, etc. Online environments allow teachers to work with larger numbers of students and optimize their routine tasks. Virtual learning also brings new pedagogical

techniques into the traditional forms of education and makes learning more personalized and convenient.

This study seeks to therefore assess virtual learning as a method of teaching and learning in secondary schools in Minna, Niger State.

1.3 Aim and Objectives

The main aim of this project is to ascertain virtual learning as a method of teaching and learning in secondary school. The objective includes; To

- i. determine the impacts of virtual learning as a method of teaching and learning in secondary school.
- ii. investigate the extent of secondary school students' preparedness to be participating in virtual learning.
- iii. ascertain the areas of improvement for teaching and learning through virtual learning among secondary school students.

1.4 Research Questions

- i. What are the impacts of virtual learning as a method of teaching and learning in secondary school?
- ii. To what extent is secondary school students' preparedness to be participating in virtual learning?
- iii. What are the areas of improvement for teaching and learning through virtual learning among secondary school students?

1.5 Hypotheses of the Study

The hypothesis of the work is;

- i. There is no significant difference of the impacts of virtual learning as a method of teaching and learning in secondary school.
- ii. There is no significant difference of the rating of students' preparedness to be participating in virtual learning.
- iii. There is no significant difference of improvement for teaching and learning through virtual learning among secondary school students.

1.6 Scope of the Study

The scope of this study would focus on all the secondary schools in urban area in Minna metropolis, Niger State. The study would be restricted to examine the virtual learning as a method of teaching and learning in secondary schools in Minna, Niger State.

1.7 Significance of the Study

The findings of the study will be beneficial to school administrators and government in decision making. The study will also help realize the importance of virtual learning as a method of teaching and learning in secondary schools and ensure provision of required facilities and equipment that will broaden the student's knowledge in the area of information and communication technology learning.

1.8 Operational Definition of Terms

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Conceptual Frame Work

A conceptual frame work is an analytical tool with several variations and context. It is used to mark conceptual distinctions and organize ideas. It is also a generalization or abstraction from experience or the result of attains formation of existing ideas.

2.1.1 Principles of Effective Online Pedagogy

The first principle is centered on the fact that the instructor must give way to student-led learning in an online course due to the distance between the instructor and the student. The instructor can adjust the curriculum to be more student centered via letting students take charge of leading their own learning. Pelz mentioned several ways this can be done:

- i. Student led discussions
- ii. Students find, discuss, and share web resources
- iii. Peer assistance and teaching
- iv. Peer grading and review
- v. Case study analysis as a group where students can learn from each other

The second Pelz (2004) principle of effective online pedagogy is that interactivity is the key to quality online learning. Students must have a way to connect with each other and to interact with the instructor, other students, and the learning materials.

The final principle is the need for presence. In an online course, the distance between the student, instructor, and learning materials can lead to higher rates of dropouts and less motivated learners. Through integrating approaches to increasing both student and instructor presence in the online course, students will be more engaged in the learning process.

There are several different kinds of course presence that Pelz (2004) outlines:

1. **Social Presence:** It is essential that the instructor create an online learning community where each student can express their online personality, can feel welcome to share questions and ask for help, and can feel that they belong.
2. **Cognitive Presence:** Students need an environment where they are free to construct meaning through discussion and a community of inquiry.
3. **Teaching Presence:** Students need an expert's guidance, and while online teaching requires students to become more autonomous, they will still need to feel that the instructor is present to answer questions, guide discussions, push learning, and manage the virtual classroom.

2.1.2 Importance of Virtual Learning on Secondary School Students

1. Access to coursework from anywhere at any time

There is the freedom to study and complete your coursework from anywhere and at any time that suits your busy schedule.

2. Combination of structure and freedom

Online programme is built on a structure of weekly assignments and dates that you must meet, whether it's taking an online test; posting homework, papers and projects; watching a faculty presentation; or participating in a discussion with fellow classmates.

However, within the program's structure you have the freedom to choose the best times to participate that sync with your schedule

3. Effective time management

An online education provides a welcome environment for working adults who need to balance to work and family with the new demands of going back to school. Right away, you save hours every week not having to commute back and forth to classes and that's just the beginning.

Going back to school sharpens your time management skills, because you have to be disciplined and find the time to study.

4. Expanded world view

Online degree programs attract students from around the world, who bring different perspectives from diverse culture. You may have opportunities to work on group projects and collaborate with international classmates. Insights into other business cultures, attitudes, and problem-solving approaches can inform your own approaches to problems and opportunities.

5. Asynchronous discussions with classmates

This avails the students to make contributions to online discussions with classmates in respective of whether the topic has change or not.

6. Immediate feedback on tests

When you're enrolled in one of the many online schools available, you don't have to worry and wait for days for test results. You take your tests online, and they are usually scored

when you finish. You can quickly see where you did well and where you need improvement. When you submit papers and projects, you'll use a private "drop box" where your teacher will access your assignments confidentially and provide written or video feedback.

7. Sharpened digital skills

While increasing your knowledge and skills in your area of study, you'll also be honing your digital skills on the most sophisticated online learning technology. As you continue to learn and study in an online world, you'll become confident and highly productive using interactive online tools such as online tests, drop boxes for homework, collaboration tools, e-mail communications to faculty and fellow classmates and video presentations by faculty.

2.1.3 How Does Going Virtual Help

Virtual learning has meant trying to re-create the traditional classroom but this time totally online. Virtual learning attempts to reproduce the organization, materials and activities in a different physical space. For example, during the COVID-19 pandemic most big private schools have continued to organize teachers and students in class groupings and follow modified school schedules, trying to replicate teacher and student interactions in Zoom classrooms, WhatsApp groups classroom, and creating a website chat.

Many teachers have been creative in their online classroom practices. Their efforts highlight the essential learning interactions. For example:

- The importance of student-teacher relationships. Simple practices like greeting students and being authentic help to build these relationships.

- The value of student-to-student interactions. Teachers have successfully re-created many of the small-group student learning structures that support collaborative and higher-level learning.

2.2 Theoretical Review

The quality of online education depends on the proper use of digital technologies in accordance with modern educational theories. This theories includes the following:

2.2.1 Behaviorism

Behaviorism examines how students behave while learning. It focuses on how learners respond to certain stimuli. When the teacher repeats the stimuli, they can observe, control, and modify the learner's individual behavior. Learners do what they are instructed to do and are only prepared to reproduce basic facts and automatically perform tasks. Behaviorism does not examine the mind or cognitive processes.

In virtual learning, behaviorism can be applied through step-by-step video tutorials, game-based activities, regular and constructive feedback, quizzes, gamification, etc.

2.2.2 Cognitivism

Cognitivism focuses on the role of the mind and cognitive processes in learning. It explains how the brain is functioning and the levels of cognitive development that form the foundation of learning. Studies of cognitivism help educators understand how people learn and how to teach more effectively.

In virtual learning cognitivism can be applied through customizable learning environments, adaptive and personalized learning applications, AI, learning analytics, etc. It is important to provide content that is tailored to your learners' cognitive abilities, such as text, images, multimedia, etc., in which the learners can choose how lessons are presented.

2.2.3 Social constructivism

Teaching and learning are explained as complex interactive social phenomena that take place between teachers and students. Learning activities focus on experience sharing, teamwork, and collaborative learning.

Social constructivism finds perfect application in group discussions, brainstorming, problembased learning, and small group activities. A great environment for these types of activities is the virtual classroom for live online teaching with interactive tools like collaborative webconferencing, an online whiteboard, breakout rooms, screen sharing, etc.

2.2.4 Basic characteristics and benefits of virtual learning

- Remote access to an unlimited array of educational services (topics and tutors) offered worldwide
- Individualized learning process that takes into consideration the personal level of competence, individual needs, and different learning styles
- Safe and secure learning environment
- Flexible learning in terms of time, location, and pace
- Cost-effectiveness, time-effective, easily scalable and much more

2.2.5 Models of Virtual Learning Instruction

There are two primary models of Virtual Learning instruction.

1. Synchronous learning refers to environment in which everyone takes part in learning at the same time. Lecture is an example of synchronous learning in face-to-face environments. Synchronous learning in education is used to help decrease the challenges associated with transactional distance that occur in online education (Joel, 2003). Joel also gave the following as examples of synchronous learning environments namely having students who are watching a live streaming of a class take part in a chat, and having students and instructors participate in a class via a web conference tool such as Black Board Collaborate, Adobe Connect, Web Ex, Skype, etc. Synchronous e-learning lets the teacher conduct classes over the Internet. Moreover, the synchronous technologies also allow people to interact with peers and experts (www.e-learningconsulting.com/consulting/what/synchronous.html).
2. Asynchronous learning according to Lado (2012) is a learning that happens independent of time and space. Learners are able to interact with course materials and with each other at a time of their choosing. In addition, asynchronous e-learning gives e-learning much appeal.

2.2.6 Advantages of Virtual Learning

1. Class work can be scheduled around work and family.
2. It reduces travel time and travel cost for off-campus students.
3. Students may have the option to select learning materials that meet their level of knowledge and interest.

4. Students can study anywhere they have access to a computer and Internet connection.
5. Self-paced learning modules allow students to work at their pace.
6. There is a flexibility to join discussions in the bulletin board threaded discussion areas at any time, or visit classmates and instructors remotely in a chatroom.
7. Instructors/students both report that e-learning fosters more interaction among students and instructors than in large lecture courses.
8. It can accommodate different learning styles and facilitate learning through a variety of activities.
9. It develops knowledge of the Internet and computer skills that will help learners throughout their lives and career. Successfully completing online or computer-based courses builds selfknowledge and self-confidence and encourages students to take responsibility for their learning.

2.2.7 Disadvantages of Virtual Learning

1. Learners with low motivation or bad study habits may lag behind. Without the routine structures of a traditional class, students may yet lose or be confused about course activities and deadlines.
2. Students may feel isolated from the instructor and classmates. Instructor may not always be available when students are studying or need help.
3. Slow internet connections or older computers may make accessing course materials frustrating.

2.3 Empirical Studies

Vladimir *et.al*, (2001), on the ‘virtual learning system’ In this study, a virtual learning system that integrates virtual classroom and virtual laboratory services is presented. The Virtual Classroom represents an interface between the students and a virtual professor and provides personalized learning materials to the users. The virtual laboratory offers a possibility to the attendees to share different resources at once and work with them as if they were at the same place where (real) resources are. In the system design, they use agents as entities that work on different tasks in the system. A set of agents of the same type is responsible for handling different users and their requests. The cooperation among agents is established through the act of exchanging messages.

According to Gambari *et.al*, (2014), in their work ‘improving secondary school students’ achievement and retention in biology through video-based multimedia instruction’. The study examined the effects of video-based multimedia instruction on secondary school students' achievement and retention in biology. In Nigeria, 120 students (60 boys and 60 girls) were randomly selected from four secondary schools assigned either into one of three experimental groups: Animation + Narration; Animation + On-screen Text; Animation + Narration + On-screen Text or a control group. The pre-test, post-tests experimental, and control group design was adopted. A 50-item multiple-choice objective test termed Biology Achievement Test (BAT) was used for collecting data. The validated BAT was tested for reliability using Kuder Richardson

(KR20), which yielded 0.89. T-test, analysis of covariance (ANCOVA), and Scheffe’s post-hoc analysis was used in determining the significant differences among the four groups. The

results showed that there was no statistically significant difference among the experimental groups. Generally, students under multimedia instruction performed better than their colleagues in the conventional teaching method. However, students in conventional teaching method had better retention than other groups.

Olibie *et.al*, (2014), on ‘awareness of virtual learning among students of two Nigerian Universities: Curriculum implications. This study investigated the extent of awareness of virtual learning among students in two public universities in Anambra State. Guided by two research questions, a sample of 640 year three students was used. The survey research design was used. A researcher-developed questionnaire titled “Virtual Learning Awareness Questionnaire” (VLAQ) was used to collect data. The findings indicated that a greater percentage of the students were unaware of what constitutes virtual learning and its’ benefits. There were also differences between male and female students’ awareness of what constitutes virtual learning and its benefits. The findings imply that the students lacked much knowledge of what virtual learning entails and the benefits to their curriculum offerings. Consequently, they are not likely to highly engage in virtual learning to enrich their course curriculum. This could limit their global participation and make them lag behind other students in the international arena. Besides, the extent of awareness was higher for female than male students. There is the implication that this trend would result in gender gap in virtual learning against male students in the future.

Gambari *et.al*, (2014), in ‘comparative effects of two modes of computer-assisted instructional package on solid geometry achievement’. The study examined the effects of two modes of computer-assisted instructional package on solid geometry achievement amongst senior secondary school students in Minna, Niger State, Nigeria. Also, the influence

of gender on the performance of students exposed to CAI(AT) and CAI(AN) packages were examined. This study adopted a pretest-posttest experimental design with 3 x 2 factorial design and a sample of 120

Senior Secondary class Two (SSII) students (60 male and 60 female). Computer-Assisted Instructional package of two modes; Animation with Text (AT), and Animation with Narration (AN) were employed as treatment instruments and a Solid Geometry Achievement Test (SGAT) was used as test instrument. A trial test was carried out and a reliability coefficient of 0.78 was obtained using the KR-21. Analysis of Variance (ANOVA) and t-test was used in analysing data collected. The study revealed that, there were significant differences in the post-test mean scores of CAI(AT), CAI(AN) and the control group ($F = 11.468$, $df = 119$, $p < 0.05$) and the Scheffe's post-hoc test revealed a significant difference between CAI(AN) and the lecture method groups, favoring CAI(AN), there was no statistically significant difference in the post-test mean scores of male and female students taught using CAI(AT) ($t = 0.660$, $df = 38$, $p > 0.05$) and CAI(AN) ($t = 1.455$, $df = 38$, $p > 0.05$).

Falode *et.al*, (2015), on effectiveness of virtual classroom in teaching and learning of senior secondary school mathematics concepts in Minna, Nigeria. This study was conducted to determine whether a researcher-developed Virtual Mathematics Classroom Package (VMCP) is suitable and effective in teaching and learning of Nigerian senior secondary school mathematics concepts. Three research questions were raised while one hypothesis was tested. The study adopted mix-method (survey and quazi-experimental) design. Twenty mathematics teachers were purposively sampled to evaluate the teaching functions of the package while intact classes of 102 senior secondary school students from two co-

educational secondary schools were employed for the experimental exercise. VMCP, mathematics achievement test and virtual mathematics classroom evaluation questionnaire were the research instruments used for the study. The three instruments were validated by instructional design experts, test and measurement expert, mathematics teachers and computer programmers. Findings that emanated from the administration of the instruments indicated that VMCP is suitable in teaching of the concepts treated mathematics.

Also, Etim *et.al*, (2016) in their work title ‘use of virtual learning on academic performance of JS 1 integrated science student in secondary school in Port Harcourt local government area’. This paper examined the use of virtual learning on the academic performance of JS 1 Integrated

Science Students in Secondary Schools in Port Harcourt Local Government Area of Rivers State, Nigeria. In discussing this, it examined the concept of virtual learning instruction, Synchronous and Asynchronous e-learning as compared to face-to-face traditional classroom learning and the advantages and disadvantages of virtual learning. Quasi experimental design was adopted. Population for the study comprised all JS 1 students in public secondary schools in Port Harcourt Local Government Area. Sample size of 200 students were selected from 2,910 JS 1 students in all the public secondary schools in Port Harcourt Local Government Area using the multi-stage sampling technique. Instrument for data collection was an objective Integrated Science performance test (OIPT). Two hypotheses were formulated and tested using Factorial Analysis of Variance (ANCOVA). Result of the analysis showed that there is no significant difference in student’s academic performance when virtual learning and expository methods are used in teaching Integrated Science in Junior Secondary class ($f_{1.195} = 1.606, p > .05$) and that there is no significant

difference between the academic performance of female and male students when virtual learning and expository methods are used in teaching Integrated Science in JS 1 ($F_{1, 195} = 717, p > .05$). It was therefore recommended that: Teachers should try to apply the virtual learning instruction in the teaching of Integrated Science as this was found to impact on the students achievement positively and that male and female students should be equally engaged in the learning of Integrated Science where VLS is incorporated to eliminate the gender bias in sciences.

In the work of Anekwe (2017), title 'impacts of virtual classroom learning on students' of Nigerian federal and state universities' the paper adopted a descriptive approach to examine the impacts of virtual classrooms on students' learning. Virtual classrooms are technologically-driven classrooms that support self-directed and self-regulated learning. The study was carried out in two federal and two state universities in the South-East zone of Nigeria. Four research questions and four hypotheses guided the study. The sample comprised of 280 federal university students and 226 state university students given a total sample of 506 respondents. Stratified random sampling due to ownership (federal and state) was used. Other sample techniques used were; those students who have been involved in online programmes recently and those currently in the programme. Students' consent was also sought before the selection. The instrument was validated. Internal consistency was computed using Cronbach alpha for the four sections, thus; Section A = 0.80; Section B = 0.83; Section C = 0.79; and Section D = 0.85. The instrument was administered and data collected. The data collected were analysed using means for research questions and independent sample t-test to test the hypotheses at 0.05 level of significance. The results showed among others that virtual classrooms have positive impacts on the students of federal

and state universities, they reported positively on their continued support and preparedness for virtual classrooms.

In their work, Samba *et.al*, (2020), on ‘effects of E-Learning on Students’ performance, confidence level and science process skills acquisition in basic science and technology’. The study investigated the effects of e-learning on students’ performance, confidence level and science process skills acquisition in basic science and technology in Oju metropolis. The study utilised a non-randomised pre-test and post-test quasi-experimental design. A sample of 107 Upper Basic II students drawn from a population of 803 in Oju using purposive sampling technique was used. The students in the experimental group were taught using e-learning while their control group counterparts were taught using expository strategy. The instruments used for data collection were BPET, BCOT and BPAT which gave reliability coefficients of 0.92, 0.87 and 0.83 using KuderRichardson (KR21) and Cronbach Alpha respectively. Three research questions were answered using mean and standard deviation while the three null hypotheses were tested using ANCOVA at 0.05 level of significance. The findings of the study revealed that, there were significant difference between students’ performance ($P = 0.00 < 0.05$), confidence level ($P = 0.00 < 0.05$) and science process skills acquisition scores ($P = 0.00 < 0.05$) of the experimental and control groups. Based on the findings, it was concluded that e-learning has enhanced students’ performance, confidence level and science process skills acquisition scores better than conventional strategy.

Also, Eze *et.al*, (2021), in ‘impact of COVID-19 pandemic on education in Nigeria: Implications for Policy and Practice of e-learning’. This study investigated the challenges posed by, and the impacts of COVID-19 on Education in Nigeria. A sequential exploratory mixed method design was adopted for the study. Results showed that the challenges of

education during the COVID19 pandemic include school closure, poor learning, unequal access to education opportunities and poor skills. Further, the pandemic negatively impacts education, causing poor school enrolment, inequality in education, poor achievement, poor school health and challenges in school assessment and transition. It was concluded that COVID19 has negatively affected education in Nigeria. Implications for practice policy and practice of electronic learning (e-learning) were discussed.

2.4 Summary of Reviewed Literature

This Chapter focuses on the conceptual framework, theoretical framework and empirical studies. Conceptual framework talks about the concept of virtual learning. Importance and benefit of virtual learning, the theoretical aspect discuss the theories, the advantages and disadvantages of virtual learning, finally the empirical studies talk about the recent work done by other researchers on this research topic.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines in detail the method employed in carrying out the research study, the research design, population of the study, research sample and sampling techniques, research instruments for data collection, validation of instruments, reliability of research instrument, method of data collection and method of data analysis.

3.2 Research Design

The research design adopted for this study is descriptive research survey. A descriptive study is seen as the study of a group of people by which data is collected and the results will then be analyzed, with only few respondents considered to be representative of the entire group. This study ascertain virtual learning as a method of teaching and learning in secondary school in Minna Metropolis, Niger State.

3.3 Population of the Study

The population of this study include target population and accessible population. The target population is all senior secondary school in Bosso local government while accessible population of this study involves three senior secondary school in Minna Metropolis, Niger State. There are 375 teachers but 245 are active from the three senior secondary school selected in Bosso Local Government in Minna, Niger State.

3.4 Sample and Sampling Techniques

The schools are selected using purposive sampling technique. This can be defined as a non-probability sampling technique which was used to acquire the required sample for this research. This is because particular set of persons were needed to respond to the items from the research instrument. The sample size of this research survey is 150 which include teachers and students. The researcher would use selected secondary schools in urban area for the research in Minna Metropolis, Niger State. However, purposive sampling techniques would be used to sample all the schools in the study area.

Table 3.4.1: Names of schools selected with their corresponding number of Questionnaires

NAMES OF SCHOOLS	TOTAL NUMBER
1. Day Secondary School, Bosso, Minna	50
2. Hill-Top Model School, Minna	50
3. Day Secondary School, Chanchaga, Minna	50
	150

Source: Field Work (2023)

3.5 Research Instruments

The study made used of structured questionnaire titled: Assessment of virtual learning as a method of teaching and learning Questionnaire (AVLMTLQ). The (AVLMTLQ) was divided into two part, A and B. Part A sought socio-demographic information of the respondents which are the teachers and students. Part B is divided into two sections/parts;

Section B1: seek information on the use of virtual learning tool as a method of teaching and learning. This is based on Likert rating scale of Strongly Agreed (SA), Agreed (A), Disagree (D) and Strongly Disagree (SD).

Part B2: seek information on the effect of virtual learning tool in teaching and learning. This is based on a nominal scale of YES/ NO. Part C: seek information on opinion of teachers and students on the challenges affecting use of Virtual learning tools as a method of teaching and learning.

3.6 Validity of the Research Instrument

A structured questionnaire used as the research instrument was subjected to face and content validity. The research instrument was validated by two researchers in the field of educational technology. The questionnaire was scrutinized by experts who matched all the items of the questionnaire with the research questions to ascertain whether or not the instrument actually measured what it was supposed to measure. Their comments served as a guide in making necessary correction on the instruments.

3.7 Reliability of Research Instrument

The reliability of the instruments was determined using the test-retest reliability technique. The research instruments were administered to 30 respondents drawn from another school outside the sample schools. After a week, the instruments were re-administered to the same respondents. The data collected on the two tests were correlated by using the Pearson Product Moment Correlation Analysis. A correlation coefficient of $r=0.77$ was obtained indicating that the instrument was reliable for the study.

3.8 Method of Data Collection

The researchers personally visited the selected secondary schools and sought permission from the school principal to make use of the schools for the study. The researchers then approach the students, teachers and explain the purpose of the study to them. Thereafter, the researcher administered the questionnaire to the respondents to ascertain virtual learning as a method of teaching and learning in secondary schools' facilities. The researcher was assisted with the help of research assistant in data collection.

3.9 Method of Data Analysis

The statistical tools employed in the study to analyze the data collected through questionnaires was descriptive method of analysis in the form of frequencies and percentages. This method of analysis is necessary since it allow the essential features of a sample to be described. More so, it is used to capture population characteristics by inference as it allows for easy presentation of research data.

CHAPTER FOUR

4.0 DATA PRESENTATION, ANALYSIS, AND DISCUSSION

4.1 Introduction

This chapter presents the analysis and interpretation of the data collected. The data collected was through the use of a questionnaire while the analysis was based on research questions earlier stated in chapter one of this study.

4.2 Research Question One

What are the impacts of virtual learning as a method of teaching and learning in secondary schools in Minna, Niger state?

Table 4.1 Analysis of the research question was made and presented in the table below.

S/N	Variable	SA	A	SD	D
1	Use of Virtual learning in teaching will improve the performance of students	41.5%	26%	11%	21.5%
2	Use of Virtual learning in teaching can improve student critical thinking.	56%	23%	15.5%	5.5%
3	Knowledge of how to use Virtual learning tool by students and teachers in teaching and learning is worthwhile.	49%	38%	6%	7%
4	Virtual learning teaching is the best method of teaching	30.5%	19.5%	21%	29%
5	Use of Virtual learning in teaching contribute to academic achievement of student.	64%	31%	1.5%	3.5%

6	Virtual learning tools are difficult to use in teaching and learning.	13.5%	27.5%	48%	11%
7	Capable teachers do not need Virtual learning tools to achieve effective teaching and learning	34.5%	36.5%	17%	12%
8	Use of Virtual learning tools in teaching and learning can be enjoyable and stimulating.	40.5%	47%	5.5%	7%

Item 1 in the table above reveals that the majority of the participant (41.5%) are of the opinion that the use of Virtual learning in teaching will improve the performance of students. Item 2 in the table shows that the majority of the participant (56%) were of the view that the use of Virtual learning in teaching can improve student critical thinking. Item 3 in the table also shows that (49%) of the participant strongly agreed that the knowledge of how to use Virtual learning tools by students and teachers in teaching and learning is worthwhile. Item 4 in the table indicated that the majority of the participants (30.5%) were of the opinion that virtual learning teaching is the best method of teaching. Item 5 in the table also have the majority of the participant (64%) supporting that the use of virtual learning in teaching contributes to the academic achievement of students. Item 6 shows that the majority of the participants (48%) strongly disagree that virtual learning tools are difficult to use in teaching and learning. Item 7 had the majority of the respondent (36.5%) agreeing that capable teachers do not need virtual learning tools to achieve effective teaching and learning. Item 8 in the table shows that the majority of the respondent (47%) agrees that the use of virtual learning tools in teaching and learning can be enjoyable and stimulating.

4.3 Research Question Two

To what extent is secondary school students' prepared to be participating in virtual learning?

Table 4.2 Analysis of the research question was made and presented in the table below.

S/N	Variable	Yes	No
1	Do you use Virtual learning tools in learning and teaching?	36.5	63.5
2	Do you have any problem for using Virtual learning tools in learning and teaching?	58	42
3	Does teaching using Virtual learning tools has any effect on your academic achievement	74	26
4	Is there any relationship between Virtual learning tools and students' academic achievement?	90.5	9.5

The result in the above table shows to what extent the preparedness of secondary school participation is for virtual learning. From the result, it can be observed that the majority of the correspondence probably doesn't use virtual learning tools in teaching and learning. This can be a result of the unavailability of these tools at the disposal of the respondents. Also, a larger percentage of the respondent can be observed to have problems using virtual learning tools in learning and teaching. This can be a result of the limited knowledge or exposure to the usage of these tools. In the same vein, the majority of the respondent admits that the use of virtual learning tools has a great effect on their academic achievement. This can be likened to the combined advantage of audio and visual effects that virtual learning has over the conventional learning method. The last item on the table reveals that the majority of the

respondent opined that there is a relationship between virtual learning and tools and student academic achievement.

4.4 Research Question Three

What are the areas of improvement for teaching and learning through virtual learning among secondary school students?

Among the challenges stated by the majority of the respondent that affects the use of virtual learning tools as a method of teaching and learning are insufficient/unstable internet connectivity, lack of computer gadgets, technical problems, and time consumption among others. The solutions to these problems as stated by the majority of the respondent are; enhancing internet connectivity bandwidths, and provision of adequate and enough computer gadgets such as computers, projectors, speakers, and microphones. Training of staff and students on the usage of virtual learning equipment to counter technical problems that could come up and reduce time consume during teaching and learning.

4.5 Hypothesis Testing

H₀₁: There is no significant difference in the impacts of virtual learning as a method of teaching and learning in secondary schools.

Table 4.3 There is no significant difference in the impacts of virtual learning as a method of teaching and learning in secondary schools.

<i>Group</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Df</i>	<i>t-cal</i>	<i>t-table</i>	<i>P-value</i>
Experimental	10	2	0.71	3	2.13	1.58	0.05
Control	15	3	0.71				

The table above shows the result of the hypothesis test. It can be observed that the t-cal (2.13) is greater than the t-table (1.58) at a 0.05 level of significance. The null hypothesis is accepted. Therefore, there is no significant difference in the impacts of virtual learning as a method of teaching and learning in secondary schools.

H₀₂: There is no significant difference in the rating of students' preparedness to participate in virtual learning.

Table 4.4 There is no significant difference in the rating of students' preparedness to participate in virtual learning.

<i>Group</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>Df</i>	<i>t-cal</i>	<i>t-table</i>	<i>P-value</i>
Experimental	135	55.4	35.19	4	3.26	2.13	0.05
Control	65	48.6	35.19				

The table above shows the result of the hypothesis test. It can be observed that the t-cal (3.26) is greater than the t-table (2.13) at a 0.05 level of significance. The null hypothesis is rejected. Therefore, there is a significant difference in the rating of students' preparedness to participate in virtual learning.

4.6 Discussion of Result

The findings of the research as seen in Table 1, 2 and, 3 shows that virtual learning will play a great role in improving the academic performance, and, thinking ability, of senior secondary schools in Minna. This is because of the affirmation of a majority of the students that virtual learning and teaching methods have an effect on their academic performance as well as there is a relationship between virtual learning tools and their academic achievement. Although a majority of the students have a good rating as can be seen in table 4 as to their

preparedness to participate in virtual learning as a method of teaching, however, insufficient/unstable internet connectivity, inadequate computer gadgets, technical issues, and time consumption are some of the challenges they encountered in the adoption of virtual learning method. Enhanced internet connectivity bandwidths, and provision of adequate and enough computer gadgets such as computers, projectors, speakers, and microphones are some of the solutions that were highlighted by the correspondents.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the entire work, conclusion drawn from the study and offer recommendation for further research.

5.2 Summary of the Research

Chapter one provided the background to the study. The central objective is to determine the impacts of virtual learning as a method of teaching and learning in senior secondary schools in Minna, Niger State.

In chapter two, review of related literature was made. Chapter three presented the methodology that was used in collecting data for the study. Design of study, population of the study, sample and sampling techniques, and method of data collection and analysis were made in the study. Chapter four presented and analyzed the data that was generated for the study.

5.3 Conclusion

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

- i. Virtual learning has a significant impact on the academic achievement and thinking ability of senior secondary schools.
- ii. Students have high ratings as to preparedness to participate in virtual learning and teaching method.

- iii. Internet connectivity, lack of virtual learning tools are challenges discouraging virtual learning and teaching methods in schools.

5.4 Recommendations

Based on the findings of this study, the following recommendation was drawn by the researcher:

- i. The use of virtual learning and teaching method should be encouraged in schools so that graduates of secondary schools will be equipped with the necessary skills in the use of virtual learning tools.
- ii. Government should make adequate provision for computers as well as other virtual learning tools in government own secondary schools and as well encourage private schools to key into the approach.
- iii. Curriculum planners and curriculum development bodies in Nigeria like NERDC should design programs and policies that will incorporate the use of virtual learning and teaching approaches in some subjects such as the Senior Secondary School level.
- iv. Training and retraining of teachers on the use of virtual learning tools and provision of technical assistance by experts in the usage.

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