

**CONSTRAINTS OF COMPUTER USAGE IN TEACHING ELECTRICAL
ELECTRONICS SECONDARY SCHOOL IN VANDEIKYA LOCAL
GOVERNMENT AREA, BENUE STATE**

BY

LAN, Dondo-Ter Kelvin

2016/1/63782TI

**DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION
FEDERAL UNIVERSITY TECHNOLOGY, MINNA, NIGERIA**

APRIL, 2023

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**A PROJECT SUBMITTED TO THE SCHOOL OF SCIENCE AND TECHNOLOGY
EDUCATION, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGERIA IN
PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD
OF THE DEGREE OF BACHELOR OF TECHNOLOGY
IN INDUSTRIAL AND TECHNOLOGY EDUCATION
(ELECTRRICAL/ELECTRONIC TECHNOLOGY)**

APRIL, 2023

DECLARATION

I LAN, Dondo-Ter Kelvin Matric No: 2016/1/63782TI an undergraduate student of the Department of Industrial and Technology Education certify that the work embodied in this project is original and has not been submitted in part or full for any other diploma or degree of this or any other University.

.....
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.....
Signature & Date

CERTIFICATION

This project has been read and approved as meeting the requirement for the award of BTech degree in Industrial and Technology Education (Building Technology) of Federal University of Technology, Minna.

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DEDICATION

This work is dedicated to my mother, who inculcated hard working in me, her disciplinary life has been my source of inspiration and strength throughout this program.

ACKNOWLEDGEMENTS

The researcher's gratitude goes to the Immutable God for His faithfulness. The researcher appreciate his supervisors Mr. I. K. Kalat for their time to read, correct and contribute toward the success of this work. The researcher acknowledges the academic and non-academic staff of the Department of Industrial Technology Education and for their immense contributions toward success of the work.

My wholehearted gratitude goes to my parents, Mr PT Lan and DR Mrs. MT Lan, My brother Lan Ahemba and his family. Lan Lugar and Sister Lan sefa stephanie for their regular support financially, spiritually and in other meaningful aspects, they have all kept me going

ABSTRACT

This study is aimed at investigating constraints to the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State. In order to obtain the pertinent information of the study three objectives and three research questions. The population of the study was twenty (20) electrical electronic teachers that teach the subject in fourteen (14) schools that offer the course in Vandeikya Local Government Area of Benue State. A constructed questionnaire titled “constraint to the use of computer in teaching electrical electronic” was used to get the desired information from the teachers. Responses from the questionnaire was analyzed using descriptive statistics mean and standard deviation was used for the research questions. The findings of the study revealed importance of computer in teaching electrical electronics to secondary school students, identify constraints or factors affecting the use of computer technology in teaching electrical electronics to secondary school students and determine ways these problems can be solved. The finding of the study revealed that the use of computer in teaching electrical electronics secondary school students in Vandeikya Local Government Area of Benue State is highly significant to their academic success. It could also be asserted that inadequate classroom space that can accommodate large number of computers, inadequate or lack of computer technologists/professional that can assist teachers while teaching among others are factors affecting the use of computer in teaching electrical electronics to secondary school students. The various strategies required to solve this contingent problem are training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies, teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets, educators should be given chance to choose the kind of technology can successfully adopt for teaching in the classroom. The researcher recommends the training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies. And the teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets.

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CHAPTER ONE

1.0

INTRODUCTION

1.1 Background of the Study

Teaching and learning are continuous processes an individual undergo as long as he/she is alive irrespective of age, class, ethnicity and so on. the more knowledgeable individual teaches the less knowledgeable the person. Teaching is viewed by Afzal and Abul Kalam (2021) as a transformation process of knowledge from teachers to students. They further stated that it is the practice of identifying objectives gathering materials, methods and implementing the teaching process. According to Sequerira (2012) teaching is a set of events, outside the learners which are designed to support internal process of learning, teaching in the views of the author is outside the learner while learning is internal to the learner. In the context of this study, teaching is the art of transmitting information from the more knowledgeable person (teacher) to the less knowledgeable person (learner) with the aid of materials using appropriate methods to effect a change in the learner. The importance of teaching in learning cannot be over emphasized. Teachers are indispensable human resources in the school, they initiate the learning process, facilitate learning skills, assess the learning efficiency and are the pivoter element in the entire educational development (Nwajioba, 2014).

Teaching can be done using different instructional media, the media used depends on the topic, environment, knowledge of the teacher, age of the learners and availability of materials. The appropriate media when used enable comprehensive and concrete learning instead of abstract learning. Several media such as chalkboard, textbooks, overhead projectors, and mass media such as newspapers, movies, radio and television can be used. Others include electronic instructional media like computer, interactive video and multimedia systems, though there are

many electronic instructional media, computer is most easily accessible for use in the list country in Nigeria.

A computer is an electronic device that accepts user inputs or data and process it under the influence of a set of instructions referred to as programs to produce the desired information (output) (Mugivane, 2014). Computer is an important tool in everyday operations in areas such as engineering where it is used for designing, modelling and testing processes, manufacturing processes, ease of communication. Computers are used in education as teaching aids, storage of information for researchers, scholars and teachers among others. According to a report by the organization for economic cooperation and development (OECD), the use of computers in the education has increased significantly in recent years (OECD), 2013). Many educators have embraced the use of computers in the classroom, as they can provide a wide range of educational benefits (Glass, 2013). Some of the advantages of using computer in teaching electrical electronics include increased engagement, greater accessibility, improved communication, enhanced problem solving skills, greater convenience, and improved efficiency (Koponen, 2011). Research has also shown that the use of computers in education can lead to improved students outcomes, such as increased achievements on standardized tests (Means et al.,2010). However, it is important to note that the effectiveness of computers in education depends on how they are used and integrated into the curriculum (Mean at el., 2010) especially at the secondary school level.

Secondary school students are pupils who have passed through primary education and are into post primary institutions of learning. They study various subjects at junior secondary school level and choose subjects of study according to their course of interest at the senior secondary school level. In developed countries, most teaching is done electronically using computers and

other media but in Nigeria, only a limited number of schools use computer while teaching. The researcher therefore intends to study the constraints to the use of computer in teaching electrical electronics with the view to finding possible solution to the problems.

1.2 Statement of the Problem

The use of computer to teach subjects to secondary school students has become a common phenomenon in developed countries. Though this has started long ago, the researcher observed that most secondary schools in Vandeikya Local Government, Benue State still use other media in teaching and other than computer especially the non-electronic media despite the numerous benefits of using electronic media. Electronic media enable the simulation of the real life situation in the work place, thus making the teaching and learning by both the teacher and the learner to become concrete other than abstract learning. The researcher became bewildered upon discovery that even vocational subjects such as electrical electronics are taught without the use of computer in most secondary schools that offer this subject and the need to find out why and how the phenomenon can be changed for technological advancement.

1.3 Purpose of the Study

The purpose of the study is to determine the constraints to the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State. Specifically the study seek to;

- (I) Identify the importance of computer in teaching electrical electronics to secondary school students.
- (II) Identify constraints or factors affecting the use of computer technology in teaching electrical electronics to secondary school students.
- (III) Determine ways these problems can be solved.

1.4 Significance of the Study

The result of the study when completed will be beneficial to teachers, students, school administrators, the communities where the schools are cited, Curriculum planners, and future researchers. The result of the study will be beneficial to secondary school teachers in the following ways, it will enable those teachers who are not computer literates to develop interest in learning how to use a computer, the adoption of computer in teaching will make teaching easier for the teacher. The result of the study will also be beneficial to the students in the sense that it will encourage student who do not know how to use computer to learn, it enable students to have access to unlimited knowledge via internet access and also makes learning easier for the students.

The school administrators will also benefit from this study as they will acknowledge the importance of computer in teaching and make available computer in their schools for ease of teaching and learning. School administrators can also adapt the use of computer in storing information and school data to ensure data safety and easy accessibility.

The use of computers in teaching and learning will be beneficial to the communities where the schools that adopted this study sited, computers cannot be used without electricity, this will encourage the electrification of the community.

The determination of the constraints to the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State would provide a working document for curriculum planners to adjust, modify or re-design use of computer in teaching electrical electronics. This would make the curriculum more comprehensive and activity centred thereby producing graduates who are not only

knowledgeable but competent to effectively use computer in teaching electrical electronics in schools.

The information on use of computers in teaching and learning generated from this study could serve as a background and pointer upon which further studies could be conducted by researchers in related areas.

1.5 Scope of the Study

The study is limited to the importance of computer in teaching electrical electronics to secondary school students, identifying constraints or factors affecting the use of computer in teaching electrical electronics to secondary school students and determine ways these problem can be solved.

1.6 Assumption of the Study

The study has the following assumptions;

- i. The respondents have the requisite knowledge to answer the questionnaire items.
- ii. The respondents will be objective in answering the questionnaire items.
- iii. Use of Computer in teaching electrical electronics to secondary school students is highly beneficial to students and the teacher.
- iv. There are problems that militate against the use of computer in teaching electrical electronics to students.
- v. There are several ways such problems can be solved through public/private partnership.

1.7 Research Questions

The study seek to answer the following questions

1. What are the importance of computer in Teaching of Electrical Electronics to Secondary school students in Vandeikya Local Government Area of Benue State?
2. What are the constraints or factors affecting the use of computer technology in Teaching Electrical Electronics to Secondary school students?
3. What are the ways the problems can be solved?

CHAPTER TWO

2.0

LITERATURE REVIEW

Literature related to this study will be reviewed under the following subheadings;

1. Use of computer in teaching electrical electronics to secondary school students
2. Importance of computer in teaching electrical electronics to secondary school students
3. Constraints or factors affecting the use of computer in teaching electrical electronics to secondary school students
4. Ways these problems can be solved

2.1 Use of Computer in Teaching Electrical Electronics to Secondary School Students

A computer is viewed by Mugivane (2014) as an electronic device that accepts data, process it and produce the desired output. Computer is made up of many components that are used to process data to get the ultimate result (information). Mugivane (2014) further stressed that a computer is made of four basic parts which include input device which receives data, storage device (RAM) Random Access Memory which hold information that is being fed into the computer, processing device known as (C.P.U) Central Processing Unit which process and control the flow of information, and output device which gives out information generated by the computer (monitor, speaker, printer). A computer is a high speed system that assembles, stores, process and give out information. It is reliable and can store information for a long period of time under normal situations. A computer can produce both information on hardware and software.

Use of computer based information technology is on the increase in the 21st century and it enhances the quality of teaching and learning. (Hussani, 2018). Several studies have shown

that the use of computers in teaching Electrical and Electronics can be an effective way to engage and motivate students, as well as improve their learning outcomes (Becta, 2003; Barak & Dede, 2007; Drysdale & Anderson, 2008). For example, a study by Becta (2003) found that the use of computers in teaching electrical and electronics significantly improved student's achievement and attitudes towards the subject. Additionally, a study by Barak and Dede (2007) found that the use of interactive simulations and visualizations can help students to better understand complex concepts in electrical and electronics. Moreover, the use of computers in teaching electrical electronics can also help to promote problem solving skills and creativity (Barak and Dede, 2007; Drysdale and Anderson, 2008). For instance, a study by Drysdale and Anderson (2008) found that the use of computer based activities and projects can encourage students to think critically and creatively, and to develop their own solutions to problems. Overall, the literature suggests that the use of computers in teaching electrical and electronics can be a valuable tool for engaging and motivating students, as well as improving their learning outcome.

2.2 Importance of computer in teaching electrical electronics to secondary school students

Electrical electronic is a technical subject that is meant to develop skills, attitudes and aptitude in students that they can readily use as a source of income generation. This will make them to be self-reliant and reduce unemployment in the society and can only be achieved where the teacher employs the correct method of teaching the learners. Use of computer is one of the very effective means of teaching electrical electronics because it enables the students to acquire the psycho-motor skills involved through simulation of the actual activity where the materials are not on ground. Use of computers enable self-teaching where students interact with

programmed instructional materials (Njoku, 2012). It is at the secondary school level that learners make useful vocational choices that affect their entire life. At this level, learning by doing should be emphasized, students should be able to critically think, analyze and answer questions (Uza, 2013). The use of computer in teaching and learning cannot be overemphasized, Iyo and Daasu (2017) reiterated that information and Communication Technology based curricula, instructional materials, and educational software maximizes the learning potential and instill the locus of control into the learners which enable meaningful understanding and problem solving skill development. The authors also stressed that use of computer in teaching involves the sense of seeing, touching, hearing and also storing and retrieval of information by learners which encourage concrete learning.

According to Akom, Asante and Adjei-Frimpong (2016) Instructions assisted by computer or computer aided instruction (AI) such as guided drill and practice exercises, computer visualization of complex objects and computer facilitate communication between students and teachers makes teaching and learning easier for both teachers and students. These authors further stressed that teaching materials can be presented on computers either as texts or in multimedia formats, which include photographs, videos, animation, speech, and music. They further viewed that computers enable the visualization of complex objects that nearly impossible to view such as molecular structures or complex geometrical objects. Again, computers enable the exploration and manipulation of simulated environments that can be done with (AI) such as virtual laboratory experiments that may be too difficult expensive or dangerous to perform in a school environment.

Akom, Asante and Adjei-Frimpong (2016) also stated that computers when used in teaching reduces the cost of purchase of hard wares, transportation and other frivolities involved, that,

it also saves time and energy. Computers also plays a significant role in facilitating learning among students. With the aid of computers, students have access to unlimited resources for learning flexible and easy education. Students can easily download and save for future use, Dabas (2013) computes usage in the classroom encourages distant learning online examination and monitoring, there is adequate security provided, fairness and impartiality, saves time and cost. The author again stated that the use of computers in teaching and learning e-electronic education arouses the interest of the learner as learning is interactive and boredom is not involved. Furthermore, it makes optimal use of time, repetitive practice and immediate feedback is provided.

In the same vein, Abdurahimovna, (2020) reiterated that use of computer in teaching is that it improves the quality of education due to the novelty of activities and interest in working with a computer. The author again stated that computer usage in lesson delivery increases its effectiveness, speed up the preparation process for the lesson, allows the teacher to fully demonstrate his creativity, provides clarity, attracts a large amount of didactic material, increases the volume of work performed in the lesson by 1.5-2 times. In another narrative, the author viewed that use of computers opens up opportunities for creating qualitatively new forms and methods of preparing students for further education. Mustapha, Mohammed, Raji, Kutiriki & Dokoro (2020) listed the importance of the use of computer in teaching such as, it allows students to learn in severe environment, it allows the establishment of a classroom experience” without interrupting the established measure of communication. It enable the teacher to evaluate skills in a consistent and objective manner, it authorizes the duplication of inherent classroom order of events that may be seldom faced in material life and it enable assessment of intricate to long-term classroom synergies across institutions.

2.3 Constraints or factors affecting the use of computer in teaching electrical electronics to secondary school students

Use of computer in teaching and learning is very vital and important considering the gains by both the teacher and the learner. Use of computers while teaching creates an enabling powerful learning environment and students are able to deal knowledge in an active, self-directed and constructive way (Volman & Van Eck, Zool in Agbo, I.S. 2015). ICT is a very important instrument that support new ways of teaching and learning and is used to develop skills for cooperation, communication, problem solving and lifelong learning, it is also student centred. Despite these advantages, several factors have militated against the intensive use of computers in secondary school in Vandeikya. Several research results have enumerated factors such as the following,

Teacher Characteristics- Teacher characteristics like educational level of the teacher, age, gender, educational experience, computer knowledge and financial position determine the extent of usage of computer in teaching/learning situation, young teachers are likely to use computers because they might have been exposed to it (Agbo, 2015). The author listed other teacher's factors such as teachers learning style. A teacher who is creative in thinking, continuous learner, a life-long learner, a social learner and a decision maker may be more likely to use computers in teaching and learning situation. The author further enumerated other factors such as parent and community support, availability of vision and plan about the contribution of ICT to Education, level of and accessibility to the ICT infrastructure, availability of time to experiment, reflect and interact, school culture, level and quality of training for teacher's among others.

According to Mustapha, Mohammed, Roji, Kutiriki & Dokoro (2020), the teacher is one of the major factors that influence the use of computers in teaching, the teacher's knowledge attitude and teaching philosophy are amongst the factors that determine the utilization of technology in education. These authors listed other factors such as organizational factors like opposition to modification would avert widespread utilization of computers. Another factor pointed out by the above author is technology factor. The continuous advent of new technology hardware makes it hard for the teacher to continuously use it in front of the students when he's not familiar with its manipulations and functions. Other factors enumerated by Mustapha, Mohammed, Raji, Kutiriki and Dokoro (2020) include, inadequate classroom space that will accommodate a large number of computers, lack of expedient access to computers at home, inadequate infrastructure, wrong planning, inadequate healthy human infrastructures that sustain technology advancement in the classroom and teachers distate to take students to computer laboratory. Ndyer (2020) again pointed out problems affecting the use of computers in secondary school. Electrical electronics include, difficulty in preparing all sectors of educational system to understand and appreciate the role of ICT in the instruction process, problem in training teachers who could effectively use ICT gadgets to deliver lessons, non-availability ICT gadgets in schools or difficulty in preparing schools to procure and install ICT infrastructure. Other problems pointed out by Ndyer (2020) are; No public-private partnership in the acquisition, installation and utilization of ICT curriculum implementation, non-availability of funds to purchase ICT infrastructure, High cost of ICT infrastructure (Computers) No ICT laboratory in schools, therefore, no smart boards, computers, cam coders among others that can be utilize for teaching. Lack of maintenance and improper handling of the available computers lead to break-down or park up. The available ICT gadgets are most

times not handled properly as dust and other factors affect their operation, this shortens the life span of the computers. Non-availability of electricity in most schools has hindered the use of computers in teaching. Most rural areas are not electrified and most schools in these areas operate low-voltage generators that cannot afford to function when ICT gadgets are connected. This possess a great problem to its usage (Ndyer, 2020).

Another researcher, Gilakjani (2013) asserted that computer self-efficacy is one of the many factors that affect one's capability to use a computer. The author contended the individuals with high self-efficacy beliefs in computer see themselves as able to use computer technology while those with low self-efficacy belief are anxious when working with computer technology and hesitate to use it. This affect the integration of computer in the classroom as teachers who lack confidence will not use computer to teach for fear of failure before the students. The author, Gilakjani, (2013) again stated that, teachers teaching experience affects the use of computer technology in teaching the students, that teachers who use computer technology are those who have more teaching experiences in their classroom. Gilakjeri again pointed out that inadequate computer technology support can also affect the use of computer technology in teaching students. Lack of technical staff to support teachers in the use of ICT while teaching makes them feel reluctant in its use. Others include teachers pedagogical practices and professional development in computer technology integration (Gilakjani, 2013).

According to Muntaz (2000), factors such as lack of teaching experience with ICT, lack of on-site support for teachers using technology, lack of help supervising children when using computers, inadequate ICT specialist teachers to teach students skills, lack of computers availability and time required to successfully integrate technology into the curriculum and lack of financial support all limit the use of computers to teach students in schools. Ogbomo, (2011)

enunciated that brain drain is another major factor affecting the use of computers in teaching in Nigeria. ICT engineers, and scientists who are highly skilled in ICT use are relocated to other developed countries whose economy is better than ours resulting to lack of the critical professionals in ICT.

2.4 Ways these Problems can be Solved

Every problem when identified can be resolved when the people involved are serious. The numerous problems pointed out can be solved as indicated by the following authors. Johnson, Jacovin, Russel and Soto, (2016) suggested that training of teachers in the use of technology in the class is the best way to solve the problem of inadequate professional development and training. Continuous training of teachers will make them abreast with the new emerging technologies and how to integrate them in the class usage. The authors suggested that school administration should seek teachers training assistance from educational software companies and educational researchers as many software companies offer free professional development courses.

In the opinion of Johnson, Jacovin, Russel and Soto (2016) Technical support to teachers by professional while in the class can solve several problems. The teachers will be confident in the use of computer in teaching and will always want to utilize it. Instead of traditional methods solution to increase acceptance of classroom technology. The educators should be given the chance to choose the technology they can successfully adopt in the class as this will retain their sense of classroom control. Johnson et.al. (2016) Dearth of educational facilities in schools- Ogunshola (2019) viewed that the above problem can be solved by getting into partnership by both the public and private sector and jointly handling the educational facilities under a formidable committee that will regularly supervise and regulate how the instructional facilities

are handled. Johnson et.al (2016) also suggested that the issue of finance can be solved by crowd funding and grants. The authors again pointed out that retraining of teachers by professionals on newly adopted educational software can also increase the technical know-how of teachers on the use of computer in teaching students.

Iyo & Daagu (2017) also listed some solutions that can mitigate factors affecting the use of computer to teach in secondary schools include;

- i. Making information and communication technology to be part and parcel of the curriculum of teacher training
- ii. All employed teachers should be ICT compliance before they can be employed
- iii. Training and retraining of teachers should be done regularly
- iv. School heads should make adequate provision for the procurement of ICT infrastructure to be used during lessons.
- v. Government should also subsidize the cost of ICT infrastructure to enable every school purchase them
- vi. Parents should be encourages to purchase ICT infrastructure for their children/wards.
- vii. Non-governmental agencies should be encouraged to procure and supply ICT infrastructure to schools and
- viii. The education policy should encourage frequent utilization of ICT infrastructure during teaching-learning process, brain drain which is another major factor militating against

2.5 Summary of the review of literature

Literature related to this study will be reviewed based on concepts such as Use of computer in teaching electrical electronics to secondary school students, Importance of computer in teaching electrical electronics to secondary school students, Constraints or factors affecting the

use of computer in teaching electrical electronics to secondary school students and Ways these problems can be solved.

The review of literature clearly shows that the use of computer to teach subjects to secondary school students has become a common phenomenon in developed countries long time ago. This situation is however different for most secondary schools in Vandeikya Local Government, Benue State as they still use other media in teaching and other than computer. This was why this study was carried out to ascertain why and how the phenomenon can be changed for technological advancement.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This section describes the method that was followed in carrying out this study. The procedures include: the design of study, population of study, sample and sampling technique, instrument for data collection, validation of instrument, method of data collection, method of data analysis and decision rule.

3.1 Research Design

Research design refers to the overall blue print, plan or strategy utilized to carry out research that defines a succinct and logical plan to tackle established research question(s) through the collection, interpretation, analysis, and discussion of data. The research design for this study is a descriptive survey research design. Descriptive survey design was employed for the study because the study will collect data from a representative sample of teachers who teach electrical electronics in the secondary schools in Vandeikya Local Government Area of Benue State.

3.2 Area of Study

The area of study is Vandeikya Local Government Area of Benue State. Vandeikya local government is located between latitude $7^{\circ}5'$ and $7^{\circ}15'$ north of the equator and longitude 9° and $9^{\circ}6'$ east of Greenwich. It is located in the south, eastern part of Benue State, sharing boundaries with Obudu and Ogoja Local Government Area councils in River State and Konshisha, Kwande and Ushongo Local Government Area. The local government has a land mass of 183,939/68 square meters, the local government has twelve wards. The people there are of Tiv

ethnicity, they are subsistence farmers. The local government has fifty (50) secondary schools altogether out of which about sixteen (16) of them are UBE. (info@moe/be.gov.ng)

3.3 Population of the Study

The population of the study is twenty (20) electrical electronic teachers that teach the subject in fourteen (14) schools that offer the course in Vadeikya Local Government Area of Benue State.

3.4 Sample and Sampling Technique

The entire population was studied. There was no sampling involved as all the lectures that teach secondary school were small in number and could be efficiently handled by the researcher.

3.5 Instrument for Data Collection

The instrument for data collection is a structured questionnaire titled constraint to the use of computer in teaching electrical electronic questionnaire developed by the researcher through literature review based on the objectives of the study. The instrument is divided into two parts, part A and part B. part A is used to solicit demographic information of the respondents while part B seeks information from respondents on research questions raised. Part B is divided into three sections which are;

Section A: Importance of computer in teaching electrical electronics to secondary school students, this section has ten (10) items on a four point rating scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (DS).

Section B: Problem affecting the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government of Benue State. The section too has ten (10) items on a four point rating scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (DS).

Section: solution to the factors affecting the use of computer in teaching electrical electronics to secondary school in Vandeikya Local government Area of Benue Sate. There are ten (10) items on a four point rating scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (DS). The questionnaire has a total of 30 questionnaire items.

3.6 Validation of the Instrument

The instrument constructed by the researcher and validated by three lecturers in the department of Industrial and Technology Education. The validates looked at the content of the questionnaire items, it's appropriateness of content average suitability of items and clarity of language. Unsuitable and ambiguous items were removed, others were reviewed according to the objectives of the study.

3.7 Administration of the Instrument

The researcher with the help of two research assistants will administer the questionnaire to the twenty (20) electrical electronics teachers in the fourteen (14) schools that offer the subject in Vandeikya Local Government Area.

3.8 Method of Data Analysis

The data collected was analyzed using descriptive statistics of mean and standard deviation only because there is no hypothesis formulated for the study.

The four point rating scale is as follows

Strongly Agree 4 points

Agree 3 points

Disagree 2 points

Strongly Disagree 1 point

$$\begin{aligned}\text{Mean value} &= \frac{4+3+2+1}{4} \\ &= \frac{10}{4} = 2.50\end{aligned}$$

Mean and standard deviation were calculated thus

$$\bar{X} = \frac{\sum FX}{n}$$

Where \sum = summation

\bar{X} = Mean

X = Nominal value of each response option

F = Frequency of response to each items

N = Number of items

3.9 Decision Rule

In taking decision, about the research questions raised, any item with a mean rating of 2.50 or above was accepted as agreed, while any item rating below 2.50 was regarded as disagree.

CHAPTER FOUR

4.0

RESULTS AND DISCUSSION

4.1 Research Question One

What are the importance of Computer in Teaching Electrical Electronics to Secondary School Students in Vandeikya Local Government?

Table 4.1 Mean and Standard Deviation of Responses of Teachers on Importance of Computer in Teaching Electrical Electronics to Secondary School Students in Vandeikya Local Government

SN	Item	Mean	SD	Remark
1	It enhances the development of psychomotor skills in learners	3.42	0.97	Agreed
2	It makes teaching easier than the traditional method	2.72	0.74	Agreed
3	It allows the students to learn in severe environment	2.89	0.55	Agreed
4	It enable the learner to practice what has been taught to him/her at any time that is self-learning	2.94	0.52	Agreed
5	It maximizes the learning potential of the learner and develops problem solving skills in the learner	3.02	0.55	Agreed
6	It makes learning concrete instead of abstract learning	2.95	0.52	Agreed
7	Visualization of complex objects that are nearly impossible to view is made possible through the use of computer in teaching	3.02	0.98	Agreed
8	Dangerous or costly experiments are simulated using computer in virtual laboratories thereby reducing the danger or cost of physically carrying out the experiment	2.64	0.52	Agreed
9	Unlimited learning resources are made available to the learner, who can easily download and save for future use.	2.87	0.47	Agreed
10	A large group of learners living in different areas, towns or countries can be taught the same course at the same time without any difficulty using computers	2.82	0.97	Agreed
	Grand Mean	2.93	0.68	Agreed

Table 4.1 shows the responses of teachers importance of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government. The teachers all agreed on the fact that computer enhances the development of psychomotor skills in learners, makes teaching easier than the traditional method, allows the students to learn in severe environment, enable the learner to practice what has been taught to him/her at any time that is self-learning, maximizes the learning potential of the learner and develops problem solving skills in the learner, makes learning concrete instead of abstract learning, visualization of complex objects that are nearly impossible to view is made possible through the use of computer in teaching, dangerous or costly experiments are simulated using computer in virtual laboratories thereby reducing the danger or cost of physically carrying out the experiment, unlimited learning resources are made available to the learner, who can easily download and save for future use, can be taught the same course at the same time without any difficulty using computers with mean value ranging from 2.64 – 3.42 > 2.50. The standard deviation ranging from 0.47 – 0.98 indicate that opinion of the teachers does not largely varies from each other.

4.2 Research Question Two

What are the factors affecting the use of computers in teaching electrical electronics to secondary school students in Vandeikya Local Government Area?

Table 4.2 Mean and Standard Deviation factors affecting the of use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State.

SN	Item	Mean	SD	Remark
1	Cost of computer and ICT hardware and software has made it impossible for most schools managers to purchase and install computers in their schools for use in teaching.	3.09	0.77	Agreed
2	Educational level of the teacher, age, educational experiences, determine the extent of usage of computer in teaching by the teacher.	2.59	0.58	Agreed
3	Parent and community support affect the availability and use of computer in the school environment.	2.67	0.42	Agreed
4	Non availability of electricity in most villages where the schools are situated makes it impossible for the few schools that have computers to use while teaching.	2.93	0.58	Agreed
5	No ICT centre in the whole local government area, thus teaching with computer becomes a mirage	3.07	0.49	Agreed
6	Inadequate classroom space that can accommodate large number of computers	2.87	0.21	Agreed
7	Inadequate or lack of computer technologists/professional that can assist teachers while teaching	2.89	0.74	Agreed
8	Lack of maintenance and improper handling of the available computers leads to break down	2.62	0.47	Agreed
9	Time required to successfully integrate computer technology into the lesson is not enough	3.17	0.58	Agreed
10	Brain drain is also a major factor affecting the use of computer in teaching in the classroom. Most professional are migrate to developed countries with high wage rate thereby leaving an insignificant number in the country.	2.99	0.50	Agreed
	Grand Mean	2.99	0.59	Agreed

Table 4.2 shows the responses of teachers on factors affecting the of use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State. The teachers all agreed on the fact that cost of computer and ict hardware and software has made it impossible for most schools’ managers to purchase and install computers in their schools for use in teaching. educational level of the teacher, age, educational

experiences, determine the extent of usage of computer in teaching by the teacher, parent and community support affect the availability and use of computer in the school environment, non-availability of electricity in most villages where the schools are situated makes it impossible for the few schools that have computers to use while teaching, no ICT centre in the whole Local Government Area, thus teaching with computer becomes a mirage, inadequate classroom space that can accommodate large number of computers, inadequate or lack of computer technologists/professional that can assist teachers while teaching, lack of maintenance and improper handling of the available computers leads to break down, time required to successfully integrate computer technology into the lesson is not enough, brain drain is also a major factor affecting the use of computer in teaching in the classroom, most professional are migrate to developed countries with high wage rate thereby leaving an insignificant number in the country with mean value ranging from 2.59 – 3.17 > 2.50. The standard deviation ranging from 0.47 – 0.77 indicate that opinion of the teachers does not largely varies from each other.

4.3 Research Question Three

What are the ways that can be used to solve problems affecting the use of computer technology in the teaching electrical electronics to secondary school students?

Table 4.3 Mean and Standard of Response of Teachers on ways that can be used to solve problems affecting the use of computer technology in the teaching electrical electronics to secondary school students

SN	Item	Mean	SD	Remark
1	Training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies.	2.79	0.12	Agreed
2	Teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets.	2.95	0.28	Agreed
3	Educators should be given chance to choose the kind of technology can successfully adopt for teaching in the classroom.	2.74	0.22	Agreed
4	Public-private partnership can help in the provision, maintenance and safety of the computer hardwares provided.	2.73	0.47	Agreed
5	All employed teachers should be ICT compliance before they can be employed.	2.89	0.42	Agreed
6	Brain drain can be mitigated by the government providing sustainable wage to its staff, this will stop migration of professional to other countries with better wages.	3.29	0.36	Agreed
7	Education policy should encourage frequent utilization of ICT infrastructure during teaching-learning process	3.10	0.45	Agreed
8	Information and communication technology should be part and parcel of the curriculum of the teacher training throughout the years of study of the programme.	2.70	0.62	Agreed
9	Parent's teachers associations of each school should be encouraged to provide ICT infrastructure in their wards schools, this will reduce over dependence on the government all the times.	3.85	0.65	Agreed
10	Parents can also be encouraged to provide their wards with computers to enable them use ICT gadgets and manipulation while young, and when they become teachers they will not hesitate to use it in the class.	3.39	0.57	Agreed
	Grand mean	3.04	0.42	Agreed

Table 4.3 shows the responses of teachers on ways that can be used to solve problems affecting the use of computer technology in the teaching electrical electronics to secondary school

students. The teachers all agreed on the fact that training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies, teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets, educators should be given chance to choose the kind of technology can successfully adopt for teaching in the classroom, public-private partnership can help in the provision, maintenance and safety of the computer hardwares provided, all employed teachers should be ICT compliance before they can be employed, brain drain can be mitigated by the government providing sustainable wage to its staff, this will stop migration of professional to other countries with better wages, education policy should encourage frequent utilization of ICT infrastructure during teaching-learning process, information and communication technology should be part and parcel of the curriculum of the teacher training throughout the years of study of the programme, parent's teachers associations of each school should be encouraged to provide ICT infrastructure in their wards schools, this will reduce over dependence on the government all the times, parents can also be encouraged to provide their wards with computers to enable them use ICT gadgets and manipulation while young, and when they become teachers they will not hesitate to use it in the class with mean value ranging from $2.70 - 3.85 > 2.50$. The standard deviation ranging from $0.12 - 0.65$ indicate that opinion of the teachers does not largely varies from each other. This is inline with findings of Johnson *et al.* (2016) suggested that training of teachers in the use of technology in the class is the best way to solve the problem of inadequate professional development and training and Iyo & Daagu (2017) also listed some solutions that can mitigate factors affecting the use of computer to teach in secondary schools include; Making information and communication technology to

be part and parcel of the curriculum of teacher training, All employed teachers should be ICT compliance before they can be employed.

4.4 Summary of Findings

The following are summary of the findings:

1. The findings on research question one revealed that computer enhances the development of psychomotor skills in learners, makes teaching easier than the traditional method, allows the students to learn in severe environment, enable the learner to practice what has been taught to him/her at any time that is self-learning among others.
2. The findings on research question two revealed that cost of computer and ict hardware and software has made it impossible for most schools' managers to purchase and install computers in their schools for use in teaching. educational level of the teacher, age, educational experiences, determine the extent of usage of computer in teaching by the teacher among other are factor affect the use of computer.
3. The findings on research question three that training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies, teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets, among others to be ways that can be used to solve problems affecting the use of computer technology in the teaching electrical electronics to secondary school students.

4.5 Discussion of Findings

The study assessed the constraints to the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State. The findings of the study revealed the positive significance and importance of computer to in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State as majority of all the respondent all strongly agreed on its positive impact. This is agreement with the opinion of Agbo, (2015) that the use of computer in teaching and learning is very vital and important considering the gains by both the teacher and the learner. Use of computers while teaching creates an enabling powerful learning environment and students are able to deal knowledge in an active, self-directed and constructive way.

In the same vein, Abdurahimovna, (2020) reiterated that use of computer in teaching is that it improves the quality of education due to the novelty of activities and interest in working with a computer. The author again stated that computer usage in lesson delivery increases its effectiveness, speed up the preparation process for the lesson, allows the teacher to fully demonstrate his creativity, provides clarity, attracts a large amount of didactic material, increases the volume of work performed in the lesson by 1.5-2 times

The findings of the study also disclosed that non-availability of electricity in most villages where the schools are situated makes it impossible for the few schools that have computers to use while teaching, no ICT centre in the whole Local Government Area, thus teaching with computer becomes a mirage, inadequate classroom space that can accommodate large number of computers, inadequate or lack of computer technologists/professional that can assist teachers while teaching among others are factors affecting the of use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of

Benue State. This corroborate with the findings of Mustapha, Mohammed, Roji, Kutiriki & Dokoro (2020), the teacher is one of the major factors that influence the use of computers in teaching, the teacher's knowledge attitude and teaching philosophy are amongst the factors that determine the utilization of technology in education. These authors listed other factors such as organizational factors like opposition to modification would avert widespread utilization of computers. Another factor pointed out by the above author is technology factor

The findings of the study finally revealed ways that can be used to solve problems affecting the use of computer technology in the teaching electrical electronics to secondary school students. The teachers all agreed on the fact that training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies, teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets, educators should be given chance to choose the kind of technology can successfully adopt for teaching in the classroom.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Summary of the Study

This study is aimed at investigating constraints to the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State. In order to obtain the pertinent information of the study three objectives and three research questions. The population of the study was twenty (20) electrical electronic teachers that teach the subject in fourteen (14) schools that offer the course in Vadeikya Local Government Area of Benue State. A constructed questionnaire titled “constraint to the use of computer in teaching electrical electronic” was used to get the desired information from the teachers. Responses from the questionnaire was analyzed using descriptive statistics mean and standard deviation was used for the research questions. The findings of the study revealed importance of computer in teaching electrical electronics to secondary school students, identify constraints or factors affecting the use of computer technology in teaching electrical electronics to secondary school students and determine ways these problems can be solved. The finding of the study revealed that the use of computer in teaching electrical electronics secondary school students in Vandeikya Local Government Area of Benue State is highly significant to there academic success. It could also be asserted that inadequate classroom space that can accommodate large number of computers, inadequate or lack of computer technologists/professional that can assist teachers while teaching among others are factors affecting the of use of computer in teaching electrical electronics to secondary school students. The various strategies required to solve this contingent problem are training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational

software companies will make them conversant with the new developed technologies, teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets, educators should be given chance to choose the kind of technology can successfully adopt for teaching in the classroom. The researcher recommends the training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies. And the teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets.

5.2 Implication of the Study

The finding of the study is found to be beneficial in the following ways,

- i. it will enable those teachers who are not computer literates to develop interest in learning how to use a computer, the adoption of computer in teaching will make teaching easier for the teacher.
- ii. The result of the study will also be beneficial to the students in the sense that it will encourage student who do not know how to use computer to learn, it enable students to have access to unlimited knowledge via internet access and also makes learning easier for the students.
- iii. The school administrators will also benefit from this study as they will acknowledge the importance of computer in teaching and make available computer in their schools for ease of teaching and learning. School administrators can also adapt the use of computer in storing information and school data to ensure data safety and easy accessibility.

- iv. The use of computers in teaching and learning will be beneficial to the communities where the schools that adopted this study sited, computers cannot be used without electricity, this will encourage the electrification of the community.
- v. The determination of the constraints to the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State would provide a working document for curriculum planners to adjust, modify or re-design use of computer in teaching electrical electronics. This would make the curriculum more comprehensive and activity centred thereby producing graduates who are not only knowledgeable but competent to effectively use computer in teaching electrical electronics in schools.
- vi. The information on use of computers in teaching and learning generated from this study could serve as a background and pointer upon which further studies could be conducted by researchers in related areas.

5.3 Contribution to Knowledge

This study was able to established the fact that the use of computer in Vandeikya Local Government Area of Benue State in teaching secondary school students to be inadequate. The study further reiterate that training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies will improved the use of computer in teaching electrical electronics secondary school students in Vandeikya Local Government Area of Benue State.

5.4 Conclusion

Based on the findings of the study on the constraints to the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State. The study explores importance of computer in teaching electrical electronics to secondary school students, identify constraints or factors affecting the use of computer technology in teaching electrical electronics to secondary school students and determine ways these problems can be solved.

It could be concluded that the use of computer in teaching electrical electronics secondary school students in Vandeikya Local Government Area of Benue State is highly significant to their academic success. It could also be asserted that inadequate classroom space that can accommodate large number of computers, inadequate or lack of computer technologists/professionals that can assist teachers while teaching among others are factors affecting the use of computer in teaching electrical electronics to secondary school students.

The various strategies required to solve this contingent problem are training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies, teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets, educators should be given chance to choose the kind of technology can successfully adopt for teaching in the classroom.

5.6 Recommendations

Based on the findings and conclusion of the study:

1. Training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies.
2. Teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets.
3. Educators should be given chance to choose the kind of technology can successfully adopt for teaching in the classroom.
4. Public-private partnership can help in the provision, maintenance and safety of the computer hardwares provided.
5. All employed teachers should be ICT compliance before they can be employed.
6. Brain drain can be mitigated by the government providing sustainable wage to its staff, this will stop migration of professional to other countries with better wages

5.7 Suggestion for Further Studies

1. Assessment of Effective Usage Computer in Teaching Electrical/Electronics in Secondary School in Minna North Central.

REFERENCES

- Abdurahimovna, U.F.(2020) Advantages of Using Electronic Learning Resources in the Educational Process. 8(8):31-36
- Afzal S.M & Abul Kalam MD (2021) Teaching and learning Process to Enhance Teaching Effectiveness: Literature Review. International Journal of Humanities and Innovation (IJHI) 4(1):1-4
- Agbo, .I.S. (2015) Factors Influencing the Use of Information and Communication Technology (ICT) in Teaching and Learning Computer Studies in Ohaukwu Local Government Area of Ebonyi State-Nigeria. Journal of Education and Practice. 6(7):71-86.
- Akom, A., Asante, G. & Adjei-Frimpong, B. (2016) An Investigation into the use of ICT Tools in the Technical Vocational Education Delivery and Training (TVET) Delivery Evidence from Kumasi Metropolis International Journal of Computer Application. 133(17):14-23
- Barak, M., & Dede, C. (2007). Interactive Simulations and Visualizations: effective Tools for Teaching and Learning Electrical and Electronics Concepts. Journal of Science Education and Technology, 16(6), 487-495. Doi:10.1007/s/0956-007-9068-4
- Becta (2003). The Impact of ICT on Learning and Teaching in Secondary Schools. Retrieved from <https://dera.ioe.ac.uk/1486/1/secondary-report.pdf>
- Chukwu, A.U. Problems in Computer Instruction in Secondary Schools in OBIA/AKPE Local Government Area, River State
- Dabas, N(2012) Role of Computer and Information Technology in Education System. International Journal of Engineering and Techniques. 4(1):570-574
- Drysdale, J., & Anderson, D. (2008) Using Computer-Based Activities and Projects to Promote Problem-Solving and Creativity in the Teachign of Electrical and Electronics. Australian Journal of Education Technology, 24(2), 162-177.
- Gilakjani, A.P (2013) Factors Contributing to Teachers' use of Computer Technology in the Classroom. Universal Journal of Educational Research (3):262-267.
- Glass, G.V. (2013). Meta-Analysis of the Relationships Between Educational Technology use and Students Outcomes. Educational Technology Research and Development, 61(3), 347-361.
- Hussani, R.B.A.B (2018) Application of ICT as Teaching Tool in Electrical Installation In Nigerian TVET Institutions. Sumerianz Journal of Education, Linguistics and Literature, 1(1);24-28

- Iyo, J.A & Daagu, J.L (2017) Factors Affecting ICT Utilization in Secondary Schools in Vandeikya Local Government Area of Benue State. *Journal of Resourcefulness and Distinction*. 14(1):1-15
- Johnson, A.M., Jacovina, M.E., Russel, D.E. & Soto, C. (2016) Challenges and Solutions When Using Technologies in the Classroom. In S.A. Crossley & D.S McNamara (Eds) *Adaptive Educational technologies for Literacy Instruction* New York: Taylor & Fracis Published with Acknowledgment of Federal Support. PP13-19
- Koponen, T. (2011). The Use of Computers in Education: A Review. *European Journal of Education*, 46(2), 269-286.
- Mavrer, H. (2017) Problems and Solutions for Using Computer (Networks) for Education. *Journal of Research in Innovative Teaching & Learning*. 10(1) 2017:63-78
- Means, B., Toyama, Y., Murphy, R., & Bakia, M. (2010) *Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies*. Washington, DC: U.S. Department of Education.
- Mugivane. F (2014) *Introduction to Computer Advatech Office Supplies Limited Nairobi*.
- Muntaz, S. (2000) Factors Affecting teachers' use of Information and Communications Technology: A review of the Literature *Journal of Information Technology for Teacher Education*, 9(3):319-342
- Mustapha, A., mohammed, A., Raji, E.A., Kutiriko, A. Dokoro, H.A (2020) Factors Affecting the utilization and Adoption of Technology in Education in the Role of Technology in Education *Intech. Open*.
- Ndyer, A. (2012) Adequacy of Information and Communication Technology in Nasarawa State College of Education. *Journal of Education. A book of Readings*, Akwanga.
- Njoku, S. (2012) Educational Facilities, Teacher Performance and Students' Achievement in Secondary Schools. *Journal of Educational Management*. 3(2):456-464
- Nwajioba P.N (2014) Teacher's Roles in the Implementation of the National Policy on Education in Nigeria. *Journal of Teacher Perspective* 8(1) ISSN: 2006-0173
- Ogbomo, E.F. (2011) Issues and Challenges in the Use of Information Communication Technology (ICTs) in Education. *Journal of Information and Knowledge Management*. 2(1). 1-19
- Ogunshola, F.R (2019) *Use of Computer Technology Resources in Facilitating Teaching and Learning in Private Senior Secondary Schools, in Abuja Municipal Area Council*
- Organization for Economic Cooperation and Development (OECD). (2013). *Students, Computers and Learning: Making the Connection*. Paris, France: OECD Publishing.
- Sequeira A.H (2012) *Introduction to Concepts of Teaching and Learning*. SSRN Electronics Journal DOI: 10.2/39/SSRN. 2/50/66

APPENDIX A

CONSTRAINTS TO THE USE OF COMPUTER IN TEACHING ELECTRICAL ELECTRONICS TO SECONDARY SCHOOLS QUESTIONNAIRE. FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA.

SCHOOL OF.....

PART I: DERMOGRAPHIC CHARACTERISTICS

INSTRUCTION: Please fill empty space below

Subject taught: _____

School: _____

PART B

QUESTION I

What are the importance of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government?

INSTRUCTIONS: Part B is divided into three sections. Please Tick [√] the appropriate column of the 4 points rating scale, the level at which you agree with the statement on importance of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government.

- ❖ SA – Strongly Agree
- ❖ A – Agree
- ❖ D --Disagree
- ❖ SD –Strongly Disagree

What are the importance of Computer in Teaching Electrical Electronics to Secondary School Students in Vandeikya Local Government?

	Item	SA	A	D	SD
1	It enhances the development of psychomotor skills in learners				
2	It makes teaching easier than the traditional method				
3	It allows the students to learn in severe environment				
4	It enable the learner to practice what has been taught to him/her at any time that is self learning				
5	It maximizes the learning potential of the learner and develops problem solving skills in the learner				
6	It makes learning concrete instead of abstract learning				

7	Visualization of complex objects that are nearly impossible to view is made possible through the use of computer in teaching				
8	Dangerous or costly experiments are simulated using computer in virtual laboratories thereby reducing the danger or cost of physically carrying out the experiment				
9	Unlimited learning resources are made available to the learner, who can easily download and save for future use.				
10	A large group of learners living in different areas, towns or countries can be taught the same course at the same time without any difficulty using computers				

QUESTION II

What are the factors affecting the use of computers in teaching electrical electronics to secondary school students in Vandeikya Local Government Area.

INSTRUCTIONS: Please tick the appropriate column if whether you strongly Agree (SA), Agree (A), Disagree (D) or Strongly Disagree (SD) with the statements on factors affecting the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State.

	Item	SA	A	D	SD
1	Cost of computer and ICT hardware and software has made it impossible for most schools managers to purchase and install computers in their schools for use in teaching.				
2	Educational level of the teacher, age, educational experiences, determine the extent of usage of computer in teaching by the teacher.				
3	Parent and community support affect the availability and use of computer in the school environment.				
4	Non availability of electricity in most villages where the schools are situated makes it impossible for the few schools that have computers to use while teaching.				
5	No ICT centre in the whole local government area, thus teaching with computer becomes a mirage				
6	Inadequate classroom space that can accommodate large number of computers				
7	Inadequate or lack of computer technologists/professional that can assist teachers while teaching				
8	Lack of maintenance and improper handling of the available computers leads to break down				
9	Time required to successfully integrate computer technology into the lesson is not enough				

10	Brain drain is also a major factor affecting the use of computer in teaching in the classroom. Most professional are migrate to developed countries with high wage rate thereby leaving an insignificant number in the country.				
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QUESTION III

What are the ways that can be used to solve problems affecting the use of computer technology in the teaching electrical electronics to secondary school students?

INSTRUCTIONS: Please tick the appropriate column whether you strongly Agree (SA), Agree (A), Disagree (D) or Strongly Disagree (SD) with the statement on factors affecting the use of computer in teaching electrical electronics to secondary school students in Vandeikya Local Government Area of Benue State.

	Item	SA	A	D	SD
1	Training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies.				
2	Teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets.				
3	Educators should be given chance to choose the kind of technology can successfully adopt for teaching in the classroom.				
4	Public-private partnership can help in the provision, maintenance and safety of the computer hardwares provided.				
5	All employed teachers should be ICT compliance before they can be employed.				
6	Brain drain can be mitigated by the government providing sustainable wage to its staff, this will stop migration of professional to other countries with better wages.				
7	Education policy should encourage frequent utilization of ICT infrastructure during teaching-learning process				
8	Information and communication technology should be part and parcel of the curriculum of the teacher training throughout the years of study of the programme.				
9	Parent's teachers associations of each school should be encouraged to provide ICT infrastructure in their wards schools, this will reduce over dependence on the government all the times.				
10	Parents can also be encouraged to provide their wards with computers to enable them use ICT gadgets and manipulation while young, and when they become teachers they will not hesitate to use it in the class.				

APPENDIX B

DESCRIPTIVES VARIABLES=ITEM1 ITEM2 ITEM3 ITEM4 ITEM5 ITEM6 ITEM7 ITEM8 ITEM9 ITEM10
 /STATISTICS=MEAN STDDEV MIN MAX.**Descriptives**

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Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Use of computer in teaching enable the development of psychomotor skills in learners	20	3	4	3.42	.97
Use of computer in teaching makes teaching easier than the traditional method	20	3	4	2.72	.74
It allows the students to learn in severe environment	20	2	4	2.89	.55
Use of computer enable the learner to practice what has been taught to him/her at any time that is self learning	20	3	4	2.94	.52
Use of computer maximizes the learning potential of the learner and develops problem solving skills in the learner	20	2	4	3.02	.55
Use of computer makes learning concrete instead of abstract learning	20	1	4	2.95	.52
Visualization of complex objects that are nearly impossible to view is made possible through the use of computer in teaching	20	3	4	3.02	.98

Dangerous or costly experiments are simulated using computer in virtual laboratories thereby reducing the danger or cost of physically carrying out the experiment	20	1	4	2.64	.52
Unlimited learning resources are made available to the learner, who can easily download and save for future use.	20	2	4	2.87	.47
A large group of learners living in different areas, towns or countries can be taught the same course at the same time without any difficulty using computers	20	2	4	2.82	.97
Valid N (listwise)	20				

DESCRIPTIVES VARIABLES=ITEM11 ITEM12 ITEM13 ITEM14 ITEM15 ITEM16 ITEM17 ITEM18 ITEM19 ITEM20

/STATISTICS=MEAN STDDEV MIN MAX.

Descriptives

Notes

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	Cases Used	All non-missing data are used.
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	Elapsed Time	00:00:00.00

Descriptive Statistics

N	Minimum	Maximum	Mean	Std. Deviation
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Cost of computer and ICT hardware and software has made it impossible for most schools managers to purchase and install computers in their schools for use in teaching.	20	3	4	3.09	.77
Educational level of the teacher, age, educational experiences, determine the extent of usage of computer in teaching by the teacher.	20	2	4	2.59	.58
Parent and community support affect the availability and use of computer in the school environment.	20	2	4	2.67	.42
Non availability of electricity in most villages where the schools are situated makes it impossible for the few schools that have computers to use while teaching.	20	2	4	2.93	.58
No ICT centre in the whole local government area, thus teaching with computer becomes a mirage	20	1	4	3.07	.49
Inadequate classroom space that can accommodate large number of computers	20	3	4	2.87	.21
Inadequate or lack of computer technologists/professional that can assist teachers while teaching	20	3	4	2.89	.74

Lack of maintenance and improper handling of the available computers leads to break down	20	3	4	2.62	.47
Time required to successfully integrate computer technology into the lesson is not enough	20	3	4	3.17	.58
Brain drain is also a major factor affecting the use of computer in teaching in the classroom. Most professional are migrate to developed countries with high wage rate thereby leaving an insignificant number in the country.	20	2	4	2.99	.50
Valid N (listwise)	20				

DESCRIPTIVES VARIABLES=ITEM11 ITEM12 ITEM13 ITEM14 ITEM15 ITEM16 ITEM17 ITEM18 ITEM19 ITEM20

/STATISTICS=MEAN STDDEV MIN MAX.

Descriptives

Notes

Output Created	02-APR-2023 03:22:58	
Comments		
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	Split File	<none>

	N of Rows in Working Data File	20
Missing Value Handling	Definition of Missing	User defined missing values are treated as missing.
	Cases Used	All non-missing data are used.
Syntax		DESCRIPTIVES VARIABLES=ITEM21 ITEM22 ITEM23 ITEM24 ITEM25 ITEM26 ITEM27 ITEM28 ITEM29 ITEM30 /STATISTICS=MEAN STDDEV MIN MAX.
Resources	Processor Time	00:00:00.00
	Elapsed Time	00:00:00.00

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Training and retraining of teachers in the use of computers in the classroom teaching with the assistance of educational software companies will make them conversant with the new developed technologies.	20	1	4	2.79	.12
Teachers should be assisted in the classroom by technical staff while teaching using computers to build their confidence in handling the gadgets.	20	2	4	2.95	.28
Educators should be given chance to choose the kind of technology can successfully adopt for teaching in the classroom. This will retain their sense of classroom control.	20	2	4	2.74	.22
Public-private partnership can help in the provision, maintenance and safety of the computer hardwares provided.	20	2	4	2.73	.47
All employed teachers should be ICT compliance before they can be employed.	20	1	4	2.89	.42

Brain drain can be mitigated by the government providing sustainable wage to its staff, this will stop migration of professional to other countries with better wages.	20	3	4	3.29	.36
Education policy should encourage frequent utilization of ICT infrastructure during teaching-learning process	20	2	4	3.10	.45
Information and communication technology should be part and parcel of the curriculum of the teacher training throughout the years of study of the programme.	20	2	4	2.70	.62
Parent's teachers associations of each school should be encouraged to provide ICT infrastructure in their wards schools, this will reduce over dependence on the government all the times.	20	2	4	3.85	.65
Parents can also be encouraged to provide their wards with computers to enable them use ICT gadgets and manipulation while young, and when they become teachers they will not hesitate to use it in the class.	20	3	4	3.39	.57
Valid N (listwise)	20				