**STRATEGIES FOR EFFECTIVE TEACHING AND LEARNING OF COMPUTER STUDIES IN SECONDARY SCHOOLS IN EZEAGU LOCAL GOVERNMENT AREA OF ENUGU STATE**

**BY**

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**U16/EDU/CSE/007**

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**JULLY,2018**

**TITLE PAGE**

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**A RESEARCH WORK SUBMITTED TO THE DEPARTMENT OF SCIENCE AND VOCATIONAL EDUCATION FACULTY OF EDUCATION GODFREY OKOYE UNIVERSITY UGWU-OMU NIKE ENUGU STATE IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF SCIENCE IN EDUCATION. (B. Sc. Ed)**

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**JULLY,2018**

**APPROVAL PAGE**

This project has been approved by the Department of Science and Vocational Education, Faculty of Education, Godfrey Okoye University Ugwu-Omu Nike Enugu State.

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**DEDICATION**

This work is dedicated to God Almighty for His goodness and mercies in my life. Upon all my unfaithfulness, He remains faithful.

**ACKNOWLEDGEMENTS**

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**Abstract**

**Abstract**

*The study was designed to determine the strategies for effective Teaching and Learning of Computer Studies in Ezeagu Local Government Area of Enugu State. Specifically, the study seeks to identify the strategies for promoting effective Teaching and Learning of Computer studies in Ezeagu Local Government Area of Enugu State. Two research questions were used in the study. The research design employed was descriptive survey design. The population for the study consisted of all the secondary school teachers and students in the school. Simple random sampling technique was used to sample two hundred (200) respondents used for the study. The structure questionnaire on a four point scale was used as the instrument for data collection. It was validated by the supervisor and two other lecturers; one from the area of the study and the other from measurement and evaluation. The reliability coefficient of the instrument was 0.99 using Pearson’s formula. Data collected were analyzed using mean score. The results obtained from the data showed that the provision of internet and ICT facilities, adding computer studies in the curriculum, constant maintenance of these computers, allowing students to have access to them, supervision of teachers and students, to sensitize teachers, organizing seminar etc are strategies for effective teaching and learning of computer studies. The researcher made these recommendations that: 1. School administrators should ensure that computer teachers are sponsored on retraining programs at least twice a year. 2. The school administrators should as a matter of urgency communicates with private sectors to provide computers and other instructional materials needed for teaching of computer studies. 3. In the area of funding, the government, stakeholders etc. should assist in provision of computers and constant maintains of these computers, improving electricity supply, proper funding of schools, improving our educational system generally etc for it will enhance effective teaching and learning of computer education in schools.*

**CHAPTER ONE**

**INTRODUCTION**

**Background of the study:**

Computer is rapidly becoming available to many individuals in our society and there is no doubt that it is affecting the way we live and do things today. Computer now plays a vital role in almost every aspect of our life. Computers are now fundamental component of our schools, health care etc. Our banking system and investment cannot function effectively without computers. Some of our medical and scientific facilities now depend entirely upon computer based system. In fact, every day it gets harder to find any type business, educational institutions or a government office that does not use computers and Information, Communication Technology (ICT) in some ways. There is probably no better indication of how advanced a society is than how computerized it is.

As computer began to find usage in a variety of fields, more people have learnt how to use or operate them resulting in an effective teaching and learning in society. This is a total shift from the past when only highly trained specialized employees know how to use computers. Today, computer usage has moved from computer specialists to non-computer specialists. Currently there is a steady increase in the number of people undergoing one form of computer training or the other to be able to fit in a world of technological changes. Again, one of the fundamental demands in many established interviews for job seeker is computer literacy skill. Many people have failed to secure jobs which they are qualified for only for lack of knowledge and skills in computer operations (Ayogu, 2008).

 The use of computer as a facility is possible and necessary in our school system. Its use can aid communication among students. Computer communication has played and is still playing an important role, not only in schools, but also in offices, hospitals, libraries and in homes. At the secondary school level, computers enable the students communicate at fast, accurate and convenient pace to other people through e-mail. In computer training institutes, business centres, schools, companies etc. computer training for effective teaching and learning programs are being organized to meet the yearnings of the National Policy on Education which stipulates that computer training should be organized in order to enhance effective teaching and learning of computer concepts in schools as the Federal Ministry of Education introduced computer studies at all levels of education in Nigeria (Federal Republic of Nigeria, 2004).

The term computer studies have been used interchangeably. In some cases it has been referred to as computer education while in other cases it is called computer literacy. In whatever way, it means the same thing. Computer education is the effort or the ability to make the generality of the people computer literate. They went further to state that computer education (literacy) means ability to tell the computer what you want it to do and understand what the computer says. Computer literacy as the ability to be able to read, write and speak the language of the computer. It can also be looked at as a process of educating the people on how to use a computer to run a program and diverse application including business, industry and commerce (Okorie, 2001). Computer studies according to Edhuze (2003) involve teaching and inculcating in the learner the basic skills required to independently manipulate the computer to achieve educational goals. He further stated that, computer studies as a subject is aimed at making students acquire skills and competencies required in this digital word of competitiveness. Such basic skills and competencies upon graduation make them conversant with term and practices embedded in the world of computer. Computer studies are therefore a subject organized to enable people understand the function, uses and limitations of the computer and to provide an opportunity for the study of the modern methods of information processing. However, computer science, computer related courses and other subjects are now offered in schools: (primary, secondary and tertiary institutions). Sending and receiving data electronically will take only a few seconds. In information processing, computer can sort or search through huge amount of information in a flash. Computer communication makes any information needed easily and widely available irrespective of distant between the two destinations. But the effort to ensure effective teaching and learning among students has not been without challenges and setbacks. In schools especially in secondary school level, some schools have computers but no qualify computer teacher to teach while some have been hearing of computer but have not seen it with their eyes. Government has been promising schools on the provision of computer and its facilities without fulfilling their promises. We all know too well that computer has a lot of benefits and it is very important to impart the knowledge to the younger once for they are the leaders of tomorrow still the government and schools don’t want to implement it effectively in schools.

Some strategies need to be looked at since it has really affect effective teaching and learning of computer in secondary schools. Firstly, most of the teachers who are supposed to teach these computer assisted instruction are posted to urban schools and even those in the urban schools are inadequate while others does not have the basic knowledge of computers, since one cannot teach another what he/she does not know. Secondly, is lack of fund. In places where there are teachers with such basic knowledge of computer there has been problem of inadequate finance to purchase computer that be used for the studies. Thirdly, is the problem of instructional facilities like electricity. Computer instrument can only be possible with the help of electricity but since most of the secondary schools under this study is located in place where there is no electricity, it becomes very difficult.

Again, there is no better indication of how advance a society is than how computerized for technology rule the world. It is in this view that the researcher embarked on this study in order to highlight the ways forward in enhancing effective teaching and learning of computer education in secondary schools especially in Ezeagu Local Government Area.

Computer according to Alo (2006) is an electronic machine or device that is capable of accepting inputs or data through input devices, process the input and generates appropriate results which are displayed through the output devices.

Strategies are a general plan or set of plans intended to achieve something. It is also a method or plan chosen to bring about a desired future such as achievement of goal.

Teaching is the act of instructing. Teaching is a set of events, outside the learners which are designed to support internal process of learning.

Learningis the process of acquiring new or modifying existing knowledge, behaviours, skills, values etc. It is also the activity or process of gaining knowledge or skill by studying, practicing, being taught, or experiencing something.

**Statement of the Problem:**

The contemporary breakthrough in science and technology has created the need to use technological devices to do things that were manually done before. This includes the use of computer in many areas in human endevours.

In the academic community, the use of computer for teaching and learning has been encouraged by many educationists. But to what extent computer has improved teaching and learning is another serious area of attention. The use of computer has enhance teaching and learning but not without some fundamental problems. Some teachers who are not computer literate do not see the need to use computer to teach.

In another vain, electricity that powers the computers are not usually present in the sense that there is low supply of electricity across the nation. This has affected the use of computer to teach in schools.

The high costs of computer system and non-availability of some software packages have hindered the effective use of computer for teaching and learning in school.

The poor attitude of some teachers toward the use of computer reduces the effective use of computer in teaching and learning.

Poor performance of students in secondary school certification examination WAEC and other computer base examinations like JAMB is caused by many factors such as lack of computers and its facilities in schools, not allowing students to have access to the computer especially during practical classes, teachers teaching computer without being well trained in computer studies, not employing ICT experts to assist and help train secondary school teachers.

It is against this back drop that the researcher is carrying out a work on the strategies for effective teaching and learning of computer studies in secondary schools.

**Purpose of the Study:**

The main purpose of the study is to find out the strategies for effective teaching and learning of computer studies in secondary schools in Ezeagu Local Government Area of Enugu state. Specifically, the study seeks to:

1. Identify strategies for promoting effective teaching and learning of computer studies in secondary schools.
2. Find out motivational skills for teachers to embrace computer training for better impartation of knowledge to students.

**Significance of the study:**

This work will be beneficial to the following groups and personalities: the ministry of education, students, parents, organizations, teachers, computer software manufacturers, educational researchers etc.

The ministry of education will find this work relevant by accessing the findings on the effective strategies to be adopted so that the use of computers in secondary schools will be effective.

The students who are longing for improvement in their academic pursuit will find the work helpful as different strategies will be itemized on the best approach to use computer to teach.

The parents and guardians will have to key in to the modern means of teaching and learning in schools. The parents will be encouraged to buy computer system and its packages for their children to use for teaching and learning.

Different organizations that are interested in sponsoring school program will find this work easy to supply computer systems to be used in school to enhance teaching and learning.

Teachers will see the need to use it as the modern means of teaching to enhance teaching and learning in schools.

Educational researchers will propel the best means of using computer to browse for information, teach and learn in institutions of higher learning, by encouraging students to learn more.

**Scope of the study:**

The study intends to determine the strategies for effective teaching and learning of computer studies in secondary schools in Ezeagu Local Government Area of Enugu State.

**Research Questions:**

The following research questions guided the study:

1. What are the strategies that are responsible for promoting effective teaching and learning of computer studies in secondary schools?
2. What are the motivational skills for teachers to embrace for better impartation of the knowledge of computer studies to students?

**CHAPTER TWO**

**REVIEW OF RELATED LITERATURE**

The review of related literature of this study has been carried out and organized under the following sub-headings: Conceptual framework, Theoretical framework, Empirical review, Summary or review of related literature.

1. Conceptual framework
* Concept of Computer
* Concepts of teaching and learning
* Concepts of strategy
* Strategies of teaching and learning
* Strategies of effective computer studies
1. Theoretical framework
* Classical Conditional Theory
1. Empirical review
2. Summary of literature review

**Conceptual framework**

* **Concept of computer:**

Computer Studies is made up of two words: ‘computer’ and ‘studies’. To properly understand the two words joined together, the two are explained separately before bringing them together to make an understanding of what the concept stands for. Many authors have tried to define computer in various, ways, but a few of them will be used in this write-up.

Computer according to Alo (2006) is an electronic machine or device that is capable of accepting inputs or data through input devices, process the input and generates appropriate results which are displayed through the output devices.

Bada Adewale and Olalekan (2009) defines computer as a technological innovation under the control of stored program that can perform some of the intellectual roles of man even beyond human capacity. They went further to say that it is a power driven machine equipped with keyboards, electronic circuits, storage compartments and recording devices for the high speed performance of mathematical operations. Not minding the number of definitions given by different authors, the common fact is that computer accepts input data, processes it, stores it, retrieves it when required and displays the result as output in a desired format.

* **Concepts of teaching and learning**

It is an accepted fact that teachers are usually not born but made. Good teachers nurture their knowledge and skills through constant and deliberate efforts. One of the prerequisite to be good teacher is to understand the teaching and learning process in more depth. This facilitates better appreciation of the teaching profession as well as the process of imparting education.

 ‘Teachers tend to think that teaching is all about teachers and their role; in fact the most important aspects of the educational process are the students and what they learn.’ This leads to what 'learning' is all about.

Learningis the process of acquiring new or modifying existing knowledge, behaviours, skills, values etc. It is also the activity or process of gaining knowledge or skill by studying, practicing, being taught, or experiencing something.Learning is about a change: the change brought about by developing a new skill, understanding a scientific law, changing an attitude. The change is not merely incidental or natural in the way that our appearance changes as we get older. Learning is a relatively permanent change, usually brought about intentionally. When we attend a course, search through a book, or read a discussion paper, we set out to learn! Other learning can take place without planning, for example by experience. Generally with all learning there is an element within us of wishing to remember and understand why something happens and to do it better next time.

Learning Models:

These are models for learning; such Models can be used by any teacher depending on context. Example:

Pedagogical Vs Andragogical Models**:** Pedagogical approach teacher dominated learning situation - Students rather passive. Andragogical approach - emphasis on what the learner is doing - how adults learn.

Adult Expectations (Learning Needs):

Some of the common adult expectations are:

♣ Adults expect to be taught.

♣ Adult students expect to have to work hard.

♣ Adult student expectation is that the work is related to the vocation.

♣ Adult student’s expectation is that they expect to be treated as adults.

Each of these four expectations although stated in general terms needs to be interpreted as individual needs. Students may vary in age, sex, background, etc. If students treated as individuals - find out more about them (inside - outside classroom), the greater likelihood to relate their learning to their needs and improve learning potential. Kindness, empathy and sincerity always reap rich dividends with adult learner.

Teaching is the act of instructing. Teaching is a set of events, outside the learners which are designed to support internal process of learning. Teaching (Instruction) is outside the learner. Learning is internal to learners. You cannot motivate others if you are not self-motivated. Motives are not seen, but, Behaviours are seen. Is learning a motive or behavior? Learning is both a motive and behaviour but only behaviour is seen, learning is internal, performance is external.

Role of the Teacher:

Generally, the role of teacher can be categorized into:

• Traditional Role - Teacher Centered

• Modern Role - Facilitator (Student Centered)

There has been a change from the Traditional role to the Modern role in the present context. The learning increases when the teacher builds on the previous experience of the student. However, individual’s learning differs and each individual learns at his or her own pace. Identifying the slow learners and individual attention of the teacher may be required. Thus, effective learning is to a great extent based on experiences. Direct experiences are student centered and participation in problem solving. While in indirect experience, the contents are carefully designed and organized by teacher.

Basic Teaching Model:

Objectives are intended learning outcomes written down before the process of instruction.

General Objectives - Statement of instructional intent - student ability in general terms.

Specific objective statement of instructional intent- student ability in terms of specific and observable. Usefulness of objectives, Elements of objectives, Terminal behaviour.

Condition, and Criterion / Criteria.

Writers tend to separate learning into three main groups or domains. These are the psychomotor, cognitive and affective domains.

 Those skills, which are concerned with physical dexterity, for example changing a wheel and giving an injection, fall into the psychomotor domain. Both of the tasks do need knowledge but, predominantly they are physical skills, which need practice.

 Knowledge and knowing the 'how' and the 'why', the thinking skills, fall into the cognitive domain. Examples include 'stating the names of the major bones in the body', 'explaining why we have tides'. Both of these require thought processes to be accomplished.

The third domain, and one we often neglect, is the affective domain. This is concerned with attitudes. Examples in this domain include 'the need to eat a healthy, balanced diet', 'the need for equality of opportunity for all', and 'politeness'. These deal with feelings and emotions and are different from the examples in the other domains.

Affective Learning occurs when these three domains are seen as interdependent. Each of these domains should be developed as part of teaching/ learning session. Teachers should be able to define learning objectives in each of them.

In general, the concepts of teaching and learning, especially at the higher levels of education. Many countries make it mandatory for teachers to undergo formal course on education principles where the concepts of teaching and learning are taught. However, this exposure to teachers is non-existent for professional teachers who enter into teaching profession without any exposure to formal training in education. This sometimes may act as a constraint in the process of effective teaching and learning process.

* **The concept of strategy**

Strategy is about success. Strategy is not a detailed plan or programme of instructions; it is a unifying theme that gives coherence and direction to the actions and decisions of an individual or an organization. . A strategy is therefore defined as a framework of decision which provides basis for more detail planning. [Henry Mintzberg](https://en.wikipedia.org/wiki/Henry_Mintzberg) (2010) defined strategy as a pattern in a stream of decisions to contrast with a view of strategy as planning. Dr.  [Kvint](https://en.wikipedia.org/wiki/Vladimir_Kvint), Vladimir (2009) defines strategy as "a system of finding, formulating, and developing a doctrine that will ensure long-term success if followed faithfully."

In its broadest sense, strategy is the means by which individuals or organizations achieve their objectives. Common to definitions of business strategy is the notion that strategy is focused on achieving certain goals; that the critical actions which make up a strategy involve allocation of resources; and that strategy implies consistency, integration or cohesiveness. Yet, as we have seen, the conception of firm strategy has changed greatly over the past half century. As the business environment has become more unstable and unpredictable, so strategy has become less concerned with detailed plans and more about the quest for success. If we think back to Jeff Bezos and Lady Gaga, neither wrote detailed strategic plans but both possessed clear ideas pointed out some definitions of strategy.

● Strategy: a plan, method, or series of actions designed to achieve a specific goal or effect.

● The determination of the long‐run goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals. Alfred Chandler (2015)

● Strategy is the pattern of objectives, purposes, or goals and the major policies and plans for achieving these goals, stated in such a way as to define what business the company is in or is to be in and the kind of company it is or is to be. Kenneth Andrew (2009)

* **Strategies of teaching and learning**

Choosing a teaching and learning strategy is not an easy task. Strategies need to be chosen carefully in order to contribute most effectively to student learning. Anytime students are actively engaged in learning, exploring new ideas, and grasping the conceptual nature of the discipline, they are learning in a deeper and more meaningful way to apply that knowledge and those skills to other parts of their lives. The following information outlines some strategies that may be used to enhance student learning.

Lecturing: Ten Things to Remember

1. Lecturing is especially useful to convey knowledge, but is not well suited for higher levels of learning.

2. Decide what you want the students to know and be able to do as a result of the lecture.

3. Outline the lecture notes — first your major points, then the minor points that elaborate on or explain each major point.

4. Choose relevant, concrete examples, in advance of the lecture, selecting examples familiar and meaningful to the students.

5. Find out about the students, their backgrounds, and their goals.

6. Permit students to stop you to ask relevant questions, make comments, or ask for review.

7. Intersperse periodic summaries within the lecture.

8. Start with a question, problem, current event, or something that just grabs the students’ attention.

9. Watch the students. If you think they don’t understand you, stop and ask them questions.

10. Use active learning techniques. Use technological aids, such as multimedia presentations.

Teaching and Learning Strategy Definition and Examples

* Direct Instruction: The Direct instruction strategy is highly teacher-directed and is among the most commonly used. This strategy is effective for providing information or developing step-by-step skills. It also works well for introducing other teaching methods, or actively involving students in knowledge construction.

Possibilities Include: Lecture, Slide Presentation, Explicit Teaching, Drill and Practice, Didactic Questions, Demonstrations, Guided and Shared – reading, listening, viewing thinking, Guest Lecture, Video, Multimedia Presentation.

* Interactive Instruction: Interactive instruction relies heavily on discussion and sharing among participants. Students can learn from peers and teachers to develop social skills and abilities, to organize their thoughts, and to develop rational arguments. The interactive instruction strategy allows for a range of groupings and interactive methods. It is important for the teacher to outline the topic, the amount of discussion time, the composition and size of the groups, and reporting or sharing techniques. Interactive instruction

requires the refinement of observation, listening, interpersonal, and intervention skills and abilities by both teacher and students.

Possibilities Include: Debates, Role Playing, Panels, Brainstorming, Peer Partner Learning, Peer Assessment, Discussion, Laboratory Groups, Labs, Think/Pair/Share, Co-operative Learning, Jigsaw, Problem Solving, Tutorials, Interviewing, Conferencing, Team-Based Learning, and Seminars.

* Indirect Instruction: In contrast to the direct instruction strategy, indirect instruction is mainly student-centered, although the two strategies can complement each other. Indirect instruction seeks a high level of student involvement in observing, investigating, drawing inferences from data, or forming hypotheses. It takes advantage of students' interest and curiosity, often encouraging them to generate alternatives or solve problems. In indirect instruction, the role of the teacher shifts from lecturer/director to that of facilitator, supporter, and resource person.

Possibilities Include: Problem Solving, Case Studies, Reading, Inquiry, Reflective Discussion, Writing, Concept Formation, Concept Mapping, and Tutorials.

* Independent Study: Independent study refers to the range of instructional methods which are purposefully provided to foster the development of individual student initiative, self-reliance, and self-improvement. While independent study may be initiated by student or teacher, the focus here will be on planned independent study by students under the guidance or supervision of a classroom teacher. In addition, independent study can include learning in partnership with another individual or as part of a small group.

Possibilities Include: Essays, Computer Aided Instruction, Journals, Learning Logs, Reports, Learning Contracts, Homework, Research Projects, Assigned Questions, Learning Centres, Independent Project/Course, and Self-Assessment.

* Experiential Learning: Experiential learning is inductive, learner centered, and activity oriented. Personalized reflection about an experience and the formulation of plans to apply learning to other contexts are critical factors in effective experiential learning. The emphasis in experiential learning is on the process of learning and not on the product.

Possibilities Include: Field Trips, Narratives, Conducting Experiments, Simulations, Games, Storytelling, Field Observations, Role-Playing, Model Building, Surveys, Studio Labs, Community Engaged Learning, Study Abroad, Community Service Learning, Undergraduate Research, Internships, Practicum, Co-op Placement, Apprenticeship, Field Courses

* **Strategies of effective computer studies**

A computer study is a “one-stop shop” where you learn or upgrade your skills in a variety of computing areas. Here, specialized training in Microsoft office, adobe applications, programming, web designing and development, graphics designing and much more are offered.

Nigeria as a nation, has witnessed a lot of challenges especially in educational sector, which has been on the down ward trend. This has negatively affected the way we do things. Importantly, computer has not really gained its roots in our Nigeria schools, let alone the entire society. Its impact is not strongly felt by all, especially by our students. This is because there are some challenges facing it implementations in our society. So, in order to ensure effective teaching and learning of computer studies the following strategies should be considered:

* Improving the Funding and assistance of the government, stakeholders in Computer Studies

The assistance of the government, stakeholders etc. like constant maintains of these computers, improving electricity supply, proper funding of schools, improving our educational system generally and paying of subsides to manufacturers and importers of computer facilities as well as donation of these facilities, employing of applicants with B. Sc (Ed) and B.Ed. computer education to teach the subject will enhance effective teaching and learning of computer education in schools.

Olaitan (2008) who asserted that through funding, physical facilities such as computers and other ICT resources and infrastructure required for teaching and learning are procured, maintained, and man-power employed. Without adequate funding of any project no matter how laudable it maybe, it becomes extremely difficult to actualize the objectives of such as program. Teaching and learning of computer studies at the secondary school level required adequate funding by the government and other stakeholders of our education system. According to Ayogu (2008), computer study is costly. Many strategies have to be put in place to finance computer studies. Ayogu however emphasized that such strategies for raising fund for computer studies could come from government, private sectors, community etc.

The world is growing so complicated in science and technology that we need to buckle up to the challenges in this digital age he concluded. Computer studies is a skill merited programme aimed at manpower development, therefore, basic computer skills training needed by secondary school students requires the combined effort of parents, government, donor agencies, etc as strategies for raising funds needed for provision of computer/ICT instructional materials required for practical skill trainings and a conducive environment for the study.

* Improving the Accessibility, Availability and Supply of Instructional Facilities Required for teaching Computer Studies

The availability and supply of instructional facilities such as computers, internet, modern software, printers, generators, scanners, joy stick, Laptops, server systems etc will help to improve the understanding of students in learning of computer studies. Without adequate instructional facility like the computer, meaningful learning cannot take place. No one can be computer literate without operating the computer (Ayogu, 2008).

 The computer can be applied for instruction in two distinct ways namely: Computer Assisted Instruction (CAI) and Computer Managed Instruction (CMI) (Obineli, 2008). According to Nworgu (2008), CAI is a program of instruction or package presented as computer software for instructional purpose. He further stated that the use of CAI has been found to make teaching and learning efficient, most effective, easier and less cumbersome since it present concepts in such organized manner that makes for greater clarity and easier understanding. On the other hand, Nworgu states that CMI is a program of instruction where the computer records the learners experience and interests. Hence learners are exposed to the learning environment (computer) and allowed to discover things for themselves since constant practice leads to perfection. Other strategies include the provision of standard virtual libraries through the Parent Teacher Association (PTA) be explored to support the day-to-day use by teachers and students.

* Improving Methodology required for teaching Computer Studies

The teaching and learning of computer studies can be improved byimproving the teaching methodology adopted by computer studies teachers. Etuk (2007) who remarked that teachers need to be properly educated to bemorally responsible enough to ensure that ICT is not adopted in the classroom assurrogate teaching but as a means to enhance innovations in teaching and learning,creativity, building confidence and sense of self-reliance in both the teachers and thestudents.According to Obineli (2008) the computer takes the place of the guidance counselor in CAI while in CMI; the guidance counselor manages the teaching learning process with the aid of the computer. The computer brings different teaching methodology into learning. This teaching methodology could be in form of tutorial, drill and practices, games and different types of demonstrations methods. Teaching method for the information age should integrated different approaches to learning. According to him, teaching-learning process in the classroom should be activity centered than conveying fact to learning and forcing them to internalize them. Teachers should also try to use modern instructional materials, different teaching methods, carryout effective evaluation oflearners through the use of continuous assessment means, use of group projects, beenable to improvise learning aids through drawings and construction of systems thusensuring that students are actively engaged in the teaching and learning process.

* Improving the availability of Quality of Human Resources required for teaching of Computer Studies

The availability and quality of human resources required for teaching of computer studies will improve effective teaching and learning of computer studies. Gary (2011) who asserts that the availability of quality human resources such as staffing, personnel management is necessary because of global competition, technological advancement, economic challenges and fast changing world of work. To achieve this, there is need to deemphasize employment based on paper certificates, proven ICT experts as computer teachers be employed, consistent staff developmental activities to be planned, developed and followed up, providing scholarships to teachers and students who distinguishes themselves as well as developing and maintaining appropriate channel of communication between teachers, students and superiors staff like principals, education secretaries etc. In line with this, Etuk (2007) opined that the quality of educational experiences of each student depends on the initiative and competence possessed by the teacher. He maintained that attainment of functional and qualitative education will be a mirage without adequate trained and qualified teachers to meet the challenges of the school system in this computer age and globalization. The study supports the need to partner with internet service providers and other cooperate organizations such as GLO, MTN, YAHOO, MICROSOFT, HP etc to provide ICT training centres and skilled ICT experts required for the use and maintenance of these facilities.

* Motivation and training of teachers can enhance effective teaching and learning of computer education

The computer studies teachers and other subjectteachers in general should be retrained to become computer literate since a good numberwere not exposed to computer and its skills during their years of training (Etuk, 2007).This can be facilitated through the school administrators namely principals and vice principalsin conjunction with cooperate organizations like HP, GLO, MTN, Microsoftetc such as to equip teachers with sound computing skills that will enable them toprepares students successfully for today’s information and knowledge. Organizing seminars conferences etc to enlighten teachers, staff and also paying teachers well, training them especially in effective teaching and learning of computer education, employing ICT experts to assist and train teachers, employing more computer science teachers who are able to demonstrate sound computingskills and effective supervision and inspection of teachers and schools will equally enhance effective teaching and learning.

* Motivation and sensitization of secondary school students

Applying effective teaching methods, teaching both theories and practical, making computer science compulsory, introducing science quiz competitions with attractive price, awarding of scholarships to brilliant students who do very well in computer science and encouragement of the students by their parents is an important strategy for effective computer studies.

**Theoretical framework**

The theory upon which this work is based on is propounded by Ivan Pavlov which is known as classical conditional theory. He experimented with a dog in which he placed some food before a hungry dog and the dog salivates naturally. Food here is referred to as unconditioned stimulus (UCS) and salivation unconditional response (UCR). When the presentation of food was placed with ringing of a bell and the sequence was repeated several times, it was discovered that the dog salivated at the sound of the bell, because it is a conditional stimulus response (CR).

The educational implication of this is that when the elements of motivation, enjoyment, excitement and interest are added to teaching and learning of subjects like computer studies, students will always be willing and ready to learn.

That is to say applying effective teaching methods, teaching both theories and practical, making computer science compulsory, introducing science quiz competitions with attractive price, awarding of scholarships to brilliant students who do very well in computer science and encouragement of the students by their parents will motivate students enroll.

**Empirical review:**

**Strategies for promoting effective teaching and learning of computer studies**

Uba (2008) carried out a study on the strategies for enhancing the teaching

and learning of computer studies in Ebonyi state. The findings of this study showed that the following could enhance teaching and learning of computer studies

in Ebonyi state: appropriate methodology and facilities for teaching computer, employment of qualified teachers, establishment of cordial relationship between parents and teachers, instructional materials, practical task and monitoring of students’ abilities for teaching and learning of computer in secondary schools. Four research questions were used for the study. 33 questionnaire items were formulated and administered to 190 respondents which include computer teachers and students from eighteen secondary schools in the three zones of the state. Random sampling technique was used to sampled the eighteen secondary schools used in the study while frequency and simple mean were used for data analysis.

Another research study carried out by Nwanze (2014) on the strategies for improving computer studies in secondary schools in Oshimili and Anaocha local government area of Delta state adopted survey research design. Four research questions were used in the study. 282 respondents which include 118 principals, 118 vice principals and 46 Computer Studies teachers from 118 secondary schools in Anaocha and Oshimili L.G.As Delta state were used. Mean and standard deviation were used for data analysis. The findings of the study revealed that to achieve this, there is need to deemphasize employment based on paper certificates, proven ICT experts as computer teachers be employed, consistent staff developmental activities to be planned, developed and followed up, providing scholarships to teachers and students who distinguishes themselves as well as developing and maintaining appropriate channel of communication between teachers, students and superiors staff like principals, education secretaries etc. It was concluded that there are some basic strategies that could be adopted in other to improve the teaching of computer studies in secondary schools in Oshimili and Aniocha Local Government Areas of Delta State. It was recommended that school administrators (principals, vice principals and teachers) should be sponsored on retraining programmes at least twice a year through workshop, seminars and conferences to enable them learn the modern technological skills in their chosen field of endeavour.

**The motivational skills for teachers to embrace for better impartation of the knowledge of computer studies to students.**

Uchenna (2010) carried out a study on the motivational skills for teachers to enhance teaching and learning of computer studies in Osun State. The findings of the study showed that the following motivational skills can enhance teaching and learning of computer in Osun State: Sponsoring of teachers in computer training, employing ICT experts to assist teachers, the use of appropriate instructional materials. Five (5) research questions were used for the study, 30 questionnaires items were formulated and administered to the teachers from fifteen (15) secondary schools in the four (4) zones of the State. Random sampling and simple mean was used for data analysis.

Another study on the effect of using instructional materials in teaching and learning of computer studies was carried out by Animasolum (2009). Data was

collected from a sample of 147 students, t-test and analysts of variance was used to analyze the data collected for the study. The findings revel that student’s poor academic achievement in computer studies is partly due to the method of teaching used.

**SUMMARY OF LITERATURE REVIEW**

Words that form the framework of the research topic were thoroughly explained under the conceptual framework which discussed the concept of computer, concept of teaching and learning, concept of strategy, strategies for teaching and learning and strategies for effective computer studies.

The learning theory upon which this research topic is predicated was comprehensively discussed under the theoretical framework which based on the classical conditional theory experimented by Ivan Pavlov using dog, food and ringing of bell to achieve a conditional stimulus response. Which in the work, means that applying effective teaching methods, teaching both theory and practical and giving price to students that do well in computer studies will make teachers and students to have interest in learning of computer studies.

Four empirical studies were reviewed which include that of Uba (2008), Nwanze (2014), Uchenna (2010) and Animasolum (2009). Related works were exhaustively reviewed under the empirical studies moving the variables in the study as benchmark.

So, the literature reviewed has shown that there are so many strategies to be looked at for effective teaching and learning of computer studies.

**CHAPTER THREE**

**RESEARCH METHOD**

The chapter is discussed under the following headings: Design of the study, Area of the study, Population of the study, Sample and Sampling Techniques, Instrument for Data Collection, Validation of the Instrument, Reliability of the Instrument, Method of Data Collection and Method of Data Analysis.

**Design of the study:**

The descriptive survey design was adopted in this study. This is because it is intended to find out and describe the strategies for effective teaching and learning of computer studies in secondary schools and was considered suitable since it will solicit information from the students and teachers in the secondary school. This design, according to Osuala (2001), centers on individual and their opinions, belief, motivation and behaviour.

**Area of the study:**

This research was carried out in State Government Owned Secondary Schools in Ezeagu Local Government Area of Enugu State. There are 29 secondary schools in Ezeagu Local government Area.

**Population of the study:**

The population of the study was all the secondary schools teachers and students of State Government Owned Secondary Schools in Ezeagu Local Government Area of Enugu State. There are twenty nine (29) secondary schools with 531 teachers and 6466 students to give a total of 6997 teachers and students in Ezeagu Local Government Area of Enugu State. This was gotten from the Statistical Unit of Post Primary School Management Board (PPSMB) Enugu Educational Zone (2017/2018).

**Sample and sampling techniques:**

Ten (10) secondary schools were sampled out of 29 secondary schools in Ezeagu Local Government Area of Enugu State using simple random sampling techniques. Five (5) teachers and fifteen (15) students were sampled from the ten (10) secondary schools that is 20 respondents from each of the ten (10) sampled secondary schools giving a total of 200 respondents.

**Instrument for data collection:**

Questionnaire was used for data collection. The questionnaire was for teachers and students. A total number of ten (10) items are contained in the questionnaire with the response format of:

Strongly agreed (SA)

Agreed (A)

Disagreed (D)

Strongly disagreed (SD)

The respondents were requested to tick only one (1) answer in each line of the questions.

**Validation of the instrument:**

The initial draft of the questionnaire was given to three experts, the researcher’s project supervisor, one other lecturer in my area of study and one from measurement and evaluation (Institute of Ecumenical Education) who made corrections and suggestions. The corrections and suggestions were incorporated into the final draft before producing it.

**Reliability of the instrument**

The coefficient of correlation was used to determine the internal consistency of the instrument. The data obtained were analyzed by finding the relationship of each item in the instrument using Pearson’s product moment formula and result obtained was 0.99 indicating that the instrument is reliable for the study.

**Method of data collection:**

The instrument used in collection of the data was personally administered by the researcher to the teachers and students. After discussing with the principals the purpose of my coming and of the study, the researcher proceeded to distribute the questionnaire to the teachers and students. The students and the teachers were requested to complete the instrument either on the spot or submit at a later date after which the researcher collected them.

**Method of data analysis**

The data were analyzed using weighted mean scale in a point. The mean values are obtained by summing up the nominal values assigned to the scaling items and dividing the sum by the number of items. Thus,

Mean above = X = ∑FX

 N

Eg 4+3+2+1/4 =10/4 =2.5 (decision value cut off point)

Any item with mean of 2.50 and above was regarded as accepted (as providing a positive answer) while any item with a mean below 2.50 was rejected (as providing a negative answer). Therefore, 2.50 are regarded as the decision point for the items in tables of research questions.

**CHAPTER FOUR**

**RESULTS**

Data were analysed using research question as benchmark

**Research Question 1**

What are the strategies that are responsible for promoting effective teaching and learning of computer studies in secondary schools?

**Table 1:** Mean responses of respondents on the strategies that are responsible for promoting effective teaching and learning of computer studies in secondary schools.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | SA | A | D | SD | T | X | DEC |
| S/N | ITEMS | 4 | 3 | 2 | 1 |  |  |  |
| 1 | Provision of internet and ICT facilities to these schools will enhance effective teaching and learning among the students. | 180720 | 2060 | 00 | 00 | 200780 | 3.90 | Accept |
| 2 | Improving our educational system and adding computer studies in the curriculum generally will enhance effective teaching and learning among students. | 126504 | 74222 | 00 | 00 | 200726 | 3.63 | Accept |
| 3 | Constant maintenance of these computers to maintain their soundness and efficiency will enhance effective teaching and learning of computer education among the students. | 107428 | 90270 | 36 | 00 | 200704 | 3.52 | Accept |
| 4 | Provision of computers in the school and allowing students to have access to them will enhance effective teaching and learning of computer education among the students. | 93372 | 100300 | 714 | 00 | 200686 | 3.43 | Accept |
| 5 | Providing and building of E-library in these schools with free access to it, will enhance effective teaching and learning of computer education among students. | 106424 | 75225 | 1020 | 99 | 200678 | 3.39 | Accept |
| 6 | Effective supervision and inspection of teachers especially computer science teachers will enhance effective teaching and learning among students. | 153612 | 40120 | 714 | 00 | 200746 | 3.73 | Accept |
| **Total Mean** |  |  |  |  |  |  | **3.60** |  |

Table above shows respondents responses on the strategies for promoting effective teaching and learning of computer studies in secondary schools. It shows mean scores of 3.90, 3.63, 3.52, 3.43, 3.39 and 3.73 in items 1, 2, 3, 4, 5 and 6 which are above the acceptable mean of 2.50.

However, the total mean for table 1 is 3.60, which is equally above the acceptable mean this means the above items are really the strategies for promoting effective teaching and learning of computer studies in secondary schools.

**Research question 2**

What are the motivational skills for teachers to embrace for better impartation of knowledge of computer studies to students?

**Table 1:** Mean responses of respondents on the motivational skills for teachers to embrace for better impartation of knowledge of computer studies to students.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | SA | A | D | SD | T | X | DEC |
| S/N | ITEMS | 4 | 3 | 2 | 1 |  |  |  |
| 7 | Organizing seminars, lectures to enlighten and sensitize teachers, and school authorities on the importance of computer education will enhance effective teaching and learning among students.  | 145580 | 55165 | 00 | 00 | 200745 | 3.73 | Accept |
| 8 | Sponsoring teachers especially computer science teachers in ICT training will enhance effective teaching and learning among students. | 118472 | 70210 | 714 | 55 | 200701 | 3.51 | Accept |
| 9 | Employing ICT experts to assist and help to train teachers in schools will enhance effective teaching and learning among the students. | 114456 | 70210 | 1020 | 66 | 200692 | 3.46 | Accept |
| 10 | Paying teachers well and improving their welfare to motivate them enhance effective teaching and learning among the students. | 90360 | 90270 | 1020 | 1010 | 200660 | 3.30 | Accept |
| **Total Mean** |  |  |  |  |  |  | **3.50** |  |

Table above shows respondents responses on the motivational skills for teachers to embrace for better impartation of knowledge of computer studies to students.

It shows mean scores of 3.73, 3.51, 3.46, and 3.30 in items 7, 8, 9, and 10 which are above the acceptable mean of 2.50.

However, the total mean for table 2 is 3.50, which is equally above the acceptable mean this means the above items are really the motivational skills for teachers to embrace for better impartation of knowledge of computer studies to students.

**CHAPTER FIVE**

**DISCUSSIONS, CONCLUSIONS, IMPLICATIONS, RECOMMENDATION LIMITATION, SUGGESTION AND SUMMARY OF THE STUDY**

**Discussion of findings**

The two research questions that guided this study were the themes around which the major findings of the study were organized and discussed.

**Strategies for effective teaching and learning of computer studies in secondary schools.**

In table 1, the result obtained shows that items from 1 to 6 in the table are the strategies for promoting effective teaching and learning of computer studies.

By this, it is meant that provision of internet and ICT facilities, adding computer studies in the curriculum, constant maintenance of these computers, allowing students to have access to them, supervision of teachers and students are strategies for promoting effective teaching and learning of computer studies.

**Motivational skills for teachers to embrace for better impartation of knowledge of computer studies to students**

In table 2, the result obtained shows that the items from 7 to 10 are the motivational skills for teachers to embrace for better impartation of the knowledge of computer to students.

The following are the motivational skills: organizing seminar etc to sensitize teachers, sponsoring teachers in ICT training, employing ICT experts and paying teachers well.

The findings is in agreement with the findings of Uba (2008) which found out that appropriate methodology and facilities for teaching computer will greatly improve effective teaching and learning of computer studies in secondary schools.

Also Nwanze (2014) found that employing ICT experts as computer teachers, consistent staff development activities to be planned, develop i.e retraining of teacher to the modern computer activities, provision of scholarships will enhance teaching and learning of computer studies.

Uchenna (2010) was of the same view that sponsoring of teachers in computer training, employing if ICT experts, appropriate instructional materials, will also enhance effective computer studies.

**Conclusion**

From the results obtained from the data analysis, the researcher has concluded that there are some basic strategies that could be adopted in order to improve effective teaching and learning of computer studies in secondary schools. The study is of the view that computer studies should provide sound basis for further training in computer science at the tertiary level of education thus should be relied upon to enable students acquire the basic skills and knowledge needed to either secure a job form the government or be self-employed and earn a living or to pursue further studies in the area computer and information science. Also, funding strategies for computer studies could be used in improving the teaching and learning of computer studies in secondary schools. It is also found that strategies for improving the availability and supply of instructional facilities as well as teaching methodologies strategies could be used to enhance effective teaching and learning of computer studies in secondary schools. When students are adequately trained under an improved learning environment where instructional facilities are provided and qualified teachers engaged for the services of teaching and learning applying by proper teaching techniques there is no doubt that the performance of students in computer studies will improve considerably, and as such they are bound to develop a remarkable interest in computer studies and develop the necessary skills required to secure and succeed in the workplace.

**Implication of the study**

The educational implication from the findings are since the studies provided information on the basic strategies that will enhance effective teaching and learning of computer studies in Ezeagu Local Government Area of Enugu State: the studies implies that the strategies identified will help improve the performance of students who have been longing for improvement in their academic pursuit.it will equally help them in aspect of computer practical which will make them become self-employed after school.

On the part of the teachers, this study will implicate them to know the need to be a computer literate and to know too well that they are deprived of up- to- date information by the government or schools. They should help themselves by making personal effort in acquiring new skill and knowledge that their job demands and ensure that appropriate teaching and learning of computer studies are achieved.

To the parents, this study will help the parents to find the need to encourage and support their children in anything concerning computer since they will also through their wards key in to the modern means of doing things especially things that concerns teaching and learning.

The government will find this work so relevance, as the government of Enugu State will find the need to register computer studies in JSSCE examination so as to enable serious academic work to thrive.

To the society at large will equally benefit through producing graduates in computer studies that will be useful in the society and environment.

**Recommendations**

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

 1. School administrators (Education Secretaries and Principals) should ensure that computer teachers are sponsored on retraining programs at least twice a year through workshops, seminars and conferences to enable them learn the modern technological skills in their chosen field of endeavour.

2. The school administrators should as a matter of urgency communicates with private sectors to provide computers and other instructional materials needed for teaching of computer studies.

3. In the area of funding, the assistance of the government, stakeholders etc. like constant maintains of these computers, improving electricity supply, proper funding of schools, improving our educational system generally and paying of subsides to manufacturers and importers of computer facilities as well as donation of these facilities, employing of applicants with B. Sc (Ed) and B.Ed. computer education to teach the subject will enhance effective teaching and learning of computer education in schools.

 4. Parents through the PTA and other major stakeholders of our education should assists our secondary schools by donating instructional facilities like laptops, desktop computers, multimedia, generating sets, internet etc to enable students practice and acquire the skills of computing. And also give room for scholarships and prices for any students that perform very well in computer studies for it will enhance effective teaching and learning of computer education in schools.

**Limitation of the study**

The researcher in her minimum financially capacity managed to cope with the transportation cost on taking and collection of her research work to her supervisor, when she went to get information from the Post Primary School Management Board (PPSMB) on the number of schools, teachers and students in Ezeagu Local Government Area Enugu State and during the period she went to the selected schools to distribute her questionnaire. When it was time to fill the questionnaire, some delayed in filling their questionnaires and a good number of them lost their, forcing the researcher to reproduce more questionnaires to replace the lost ones. All these cost money.

Finally, during the course of typesetting of the report, incessant and unreliable power supply by the Enugu Electricity Distribution company (EEDC) also posed a great problem as it contributed in delaying and prolonging the research work.

**Suggestion for further research**

The researcher therefore suggests the following for further studies.

1. . The best instructional materials to use in teaching and learning of computer studies in secondary schools.
2. Impact of effective teaching and learning of computer education in secondary schools.
3. The challenges confronting the teaching and learning of computer education in secondary schools.
4. Tackling the challenges militating against effective teaching and learning in secondary schools.

**Summary of the study**

In this 21st century the term computer studies and computer literacy have been used interchangeable which is aimed at making the generality of the people computer literate. As computer began to find usage in a variety of fields, more people have learnt how to use or operate them resulting in an effective teaching and learning in society. This is a total shift from the past when only highly trained specialized employees know how to use computers. Currently there is a steady increase in the number of people undergoing one form of computer training or the other to be able to fit in a world of technological changes. Again, one of the fundamental demands in many established interviews for job seeker is computer literacy skill. Many people have failed to secure jobs which they are qualified for only for lack of knowledge and skills in computer operations (Ayogu, 2008). This means that the effort to ensure effective teaching and learning has not been without challenges and setbacks. In this view, the researcher embarked on this study in order to highlight the strategies for effective teaching and learning of computer education in secondary schools especially in Ezeagu Local Government Area.

To address this problem the researcher formulated two specific purpose of the study which seeks to: 1. Identify strategies for promoting effective teaching and learning of computer studies in secondary schools. 2. Find out motivational skills for teachers to embrace computer training for better impartation of knowledge to students. The study used the descriptive survey research design, questionnaire was the instrument used to collect data. Two research questions and ten questionnaire items was used to gather information from 20 respondents made up of five teachers and fifteen students from the ten secondary schools sampled which gives total of 200 respondents drawn from the study area. The questionnaire was validated by three validators and its reliability was established using coefficient of correlation (pearson’s product moment formula and the result obtained was 0.99 which shows that the instrument is reliable for the study. Based on the data collected and analyzed, the following major findings of the study on strategies for effective teaching and learning of computer studies in secondary schools in Ezeagu Local Government Area of Enugu State are: Provision of internet and ICT facilities, adding computer studies in the curriculum, constant maintenance of these computers, allowing students to have access to them, supervision of teachers and students etc are strategies for promoting effective teaching and learning of computer studies in secondary schools.

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 report.

**APPENDIX I**

Godfrey Okoye University,

Ugwu-Omu Nike,

Enugu State.

 Dear Respondents,

This questionnaire is designed to enable the researcher who is a student of the above institution to collect information on the “Strategies for effective teaching and learning of computer studies in secondary schools in Ezeagu Local Government Area of Enugu State.” You are requested to complete the items on the instrument as demanded by it. Be assured that all information supplies will be treated confidentially.

Thanks for your cooperation.

 Yours faithfully,

 **Onwu, Theresa O.**

 U16/EDU/CSE/007

**APPENDIX II**

QUESTIONNAIRE ON THE STRATEGIES FOR EFFECTIVE TEACHING AND LEARNING OF COMPUTER STUDIES IN SECONDARY SCHOOLS IN EZEAGU LOCAL GOVERNMENT AREA OF ENUGU STATE

**SECTION A**

**PERSONAL DATA**

Please fill or tick the spaces provided below.

* Status (in relation to this study)

 Teacher Students

 Tick ( √ ) one

**SECTION B**

Please tick (√ ) only one column in this section as applicable. The response column contains

Strongly agreed (SA)

Agreed (A)

Disagreed (D)

Strongly disagreed (SD

**QUESTIONNAIRE**

**Instructions**: kindly tick [√] in SA for strongly agreed, A for agreed, D for disagreed, SD for strongly disagreed.

**Research question 1**

What are the strategies that are responsible for promoting effective teaching and learning of computer studies in secondary schools?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEMS** | **SA** | **A** | **D** | **SD** |
| **1** | Provision of internet and ICT facilities to these schools will enhance effective teaching and learning among the students. |  |  |  |  |
| **2** | Improving our educational system and adding computer studies in the curriculum generally will enhance effective teaching and learning among students. |  |  |  |  |
| **3** | Constant maintenance of these computers to maintain their soundness and efficiency will enhance effective teaching and learning of computer education among the students. |  |  |  |  |
| **4** | Provision of computers in the school and allowing students to have access to them will enhance effective teaching and learning of computer education among the students. |  |  |  |  |
| **5** | Providing and building of E-library in these schools with free access to it, will enhance effective teaching and learning of computer education among students. |  |  |  |  |
| **6** | Effective supervision and inspection of teachers especially computer science teachers will enhance effective teaching and learning among students. |  |  |  |  |

**Research question 2**

What are the motivational skills for teachers to embrace for better impartation of knowledge of computer studies to students?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **ITEMS**  | **SA** | **A** | **D** | **SD** |
| **7** | Organizing seminars, lectures to enlighten and sensitize teachers, and school authorities on the importance of computer education will enhance effective teaching and learning among students.  |  |  |  |  |
| **8** | Sponsoring teachers especially computer science teachers in ICT training will enhance effective teaching and learning among students. |  |  |  |  |
| **9** | Employing ICT experts to assist and help to train teachers in schools will enhance effective teaching and learning among the students. |  |  |  |  |
| **10** | Paying teachers well and improving their welfare to motivate them enhance effective teaching and learning among the students. |  |  |  |  |

**APPENDIX III**

**Reliability of Instrument**

**Coefficient of correlation using Pearson’s formula**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S/N** | **X** | **Y** | **X²** | **Y²** | **XY** |
|  **1** | 3.90 | 3.73 | 15.21 | 13.91 | 14.55 |
|  **2** | 3.63 | 3.73 | 13.18 | 13.91 | 13.54 |
|  **3** | 3.52 | 3.51 | 12.39 | 12.32 | 12.36 |
|  **4** | 3.43 | 3.46 | 11.76 | 11.97 | 11.87 |
|  **5** | 3.39 | 3.30 | 11.49 | 10.89 | 11.19 |
| **Total** | **∑X = 17.87** | **∑Y = 17.73** | **∑X² = 64.03** | **∑Y² = 63** | **∑XY = 63.51** |

 **N∑XY - ∑X∑Y**

 **√ [ N( ∑X² ) - ( ∑X )² ] [ N(∑Y²) - ( ∑Y )²**

**Where** N = 5

 ∑X = 17.87

 ∑Y = 17.73

 ∑XY = 63.51

 ∑X² = 64.03

 ∑Y² = 63

 = 5(63.51) - (17.87) (17.73)

 √ [5(64.03) - (17.87)²] [5(63) - (17.73)²

 = 317.55 – 3I6.8351

 √ [320.15 – 319.3369] [315 – 314.3529]

 = 0.7149

 √ [0.8131] [0.6471]

 = 0.7149

 √ 0.52615701

 = 0.7149

 0.72536681

 = 0.98557032 ˜ 0.99