THE EXTENT OF IMPROVISATION OF INSTRUCTIONAL MATERIALS FOR COMPUTER EDUCATION IN SECONDARY SCHOOLS IN EKITI STATE, NIGERIA

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ABSTRACT

This paper examined the extent of Improvisation of Instructional Materials for Computer Education in Secondary Schools in Ekiti State, Nigeria. The research design used was descriptive type of research. The population of the study comprises of all students in public secondary schools in Ado local government area of Ekiti State, Nigeria. Simple random sampling was used to select 25 students each from four secondary schools used to makes a sum total of 100 students. The instrument used in collecting relevant data for this study was a close ended questionnaire. The instrument was subjected to validity and reliability mechanism. The reliability coefficient of the instrument is 8.79. Three null hypotheses were generated to guide the study and tested at 0.05 level of significance. The data collected were analysed using Chi-Square (X^2) statistical analysis package. The findings reveals that there is no significant difference in the extent of hardware components improvised, the extent of software components of computer improvised and the basic accessories of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria. Based on the findings, conclusion and appropriate recommendations were made.

Keywords: Improvisation, Instructional materials, Computer Education, Secondary Schools.

INTRODUCTION

The world has witnessed in the past, two major socioeconomic revolutions: the agricultural revolution and the industrial revolution. Presently, there is another socio-economic shift, which is the arrival of computer is being witnessed. This stage of revolution in the society emphasized the production, storage and distribution of information in various forms.

Computer can be seen as an electronic device or machine that is capable of accepting inputs or data through input devices. Processes the input and generates

appropriate results which are displayed through the output devices. Computer is an electronic machine used to record, store process and recall data or information.

Computer is a fast and accurate electronic machine, which is capable of accepting data as input, process data and process outputs under the influence of a stored program or instruction. Computer education can be seen as learning experiences with computer for the aim of achieving the set objectives of computer education (Nwaibe, 1994). Consequently, Computer education is aimed at making the learner computer literate.

In Ekiti State, computer education is a welcomed development whereby the teaching of computer is being administered to all students regardless of the class they belong to in secondary schools but the problems faced here is that, they don't have the entire necessary requirement needed for effective and successful teaching and learning of computer. This requirement includes: computer laboratories and libraries, enough computer systems, electric supply and instructional materials for computer education.

Education is the primary agent of transformation towards sustainable development. It increases people's capacities to transform their visions for society into reality.

All the countries strive for quality education for their sustainable development. At any education level, the quality of education depends upon several factors such as: school facilities, teacher's qualifications, traders' motivation, management and administration, etc. in other words, a quality school is a school where pupils respect their peers, their teachers and their school management. Have a voice in decision-making, are interest and engage in their learning; accept responsibility; receive feedback and encouragement from their teachers and feel valued. In addition, teachers work together and share ideals, feel values and are given support to be immovable, employ teaching strategies that are varied and personalized to meet the needs of all learners. Other are that administrative and support staff word as valued partners with principals and teachers to ensure that students are supported in their learning and that school systems work effectively to support teaching and learning.

The school as a whole is committed to continuous improvement and forms learning partnership within and beyond the school. It develops plans and targets that address its goals, seeks feedback on its performance, uses data to reflect on its outcomes, reports openly and honestly and celebrate its achievement. It is known that an individual's quality of

life and the well being of the society depend on the quality of education. Pupil's performance in primary leaving examination will greatly depend on the quality of education that pupils have gained in school.

Instructional materials are those materials that are being used by teachers to facilitate teaching and learning process. Some of these instructional materials are: print and non print materials. Print materials are any written materials that can aid the teacher in teaching: a typical example is a textbook. Non-print materials are those materials that the students can see: it includes pictures and posters chalkboard, and the use of computers. In computer education, instructional materials are used by learner in teaching and learning process to bring novelty to the lesson by making to topics being taught interesting. In Ekiti State, the instructional materials are not readily available at the reach of the teachers, there by not making the teachers knowledgeable and resourceful enough to teach. Thus, arise, the need for improvisation. Improvisation is an act of using alternative materials locally made by the teacher, students or educational agency in a state of emergency as a substitute and supplement of standard equipment.

Improvisation in science teaching refers to the act of using alternative materials and resources to facilitate instruction whenever there is lack of shortage of some specific first hand teaching aids.

Basically, the computer system is made up of two main components namely hardware component, software components are basic computer accessories. The hardware component refer to the physical part of the computer that can be seen and touched which includes the input and output devices. Example include; monitor, keyboard, central processing unit (CPU), mouse, printer, scanner and diskette (Ezdiora, 2000). The software component is a step by step instruction given to a computer in order to perform a specific task. Examples are programs and application package (Alo, 2006). Computer accessories are other equipment attached to the computer system to enable it carry out its task effectively (Ogeh, 2007). Example includes batteries, cables and connectors, cleansing suppliers, keyboard drivers, monitor stand, power cord, uninterrupted power supply, mouse pad.

In computer education, both the hardware, software and basic computer accessories can be improved. (Igwe, 2005). The teacher should look for resources or materials beyond the classroom, for sole reliance on the inadequate instructional materials of the school will

create undesirable class participation. According to Igwe (2005). The following component can be improvised for effective computer education in our schools.

Monitor: a monitor can be substituted using a carton squared shaped with the face of the carton covered with nylon materials to represent the screen of the monitor.

Keyboard: the keyboard can be substituted using carton, plywood, foam, small squared piece of carton sheet or cardboard paper to produce improvised keyboards. A foam is placed on a rectangle shaped plywood and the cut a cardboard sheet into squared small shaped to put them on the from each carrying numbers, alphabets and function to press to give input.

Printer: It can be substituted with the use of plywood or carton to produce a look alike with a standard printer.

Charts: this can be improvised by drawing on the chalkboard or on a cardboard sheet with the aid of using the pencil or master to make the drawing of the components of computer clearer to the students. All the components of computer can be draw on the chalk or blackboard to enhance better understanding of the concepts in computers in computer education to the students as well as improve their performance in computer examinations.

Judging, from the above improvisation act, we can conclude that lack of standard equipment is no excuse for not providing a suitable learning environment for computer education. The present researcher is not aware of any study concerned with the extent of improvisation of instructional materials for computer education in Ado Ekiti local government area secondary school. Hence, the need for the present study.

It's observed that classroom for the junior secondary classes are highly populated, moreso one (1) computer system was provided by the school to undergo the teaching and learning process of computer. Consequently, student's performance in their previous years exams was very poor. This is in line with Igwe (1995) when he said that computer education cannot be effectively taught and learnt without the use of relevant instructional materials. The teaching task experience by teachers is very tedious and enormous so as to ensure that each student have experienced of computer in order for the specific objective to be achieved.

Thus: it is in the realization of these problems above that prompt me in this research "Teaching and learning of student in junior secondary school? Effect of improvised

instructional materials in teaching of computer science. A case study of Ado local government Ekiti State".

Purpose of the Study

The purpose of this study is to assess the extent of improvisation of instructional materials for computer education in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Specially, the study is designed to;

1. Determine the extent of improvisation of hardware components of the computer in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

2. Determine the extent of improvisation of software component of the computer in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

3. Determine the extent improvisation of basic computer accessories in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Research Hypotheses

The following null hypotheses were formulated for the study:

1. There is no significant difference in the extent of hardware components improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

2. There is no significant difference in the extent of software components of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

3. There is no significant difference in the basic accessories of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Review of Related Literature

Meaning of Improvisation

Improvisation is an act of using alternative materials locally made by the teacher, students of educational agency in a state of emergency or scarcity as a substitute and supplement to standard equipment (Ogeli, 2007). Improvisation has also been defined according to Akusoba (1995) as the "choice of the best instructional materials which enables the teacher to achieve some carefully specific educational objectives". Osuawu (1982) also defines improvisation as the provision of materials locally made by the teachers, student or an educational agency to represent the original material or equipment. According to Enaiayeju (1983) said, "improvisation in science teaching refers to the act of using alternative materials and resources to facilitate instruction whenever there is lack or shortage of some specific first hand teaching aids"

Generally, improvisation could be regarded as the act of using alternative materials of equipment obtainable from the local environment or constructed by the teacher or with the help of local personnel to facilitate instruction. In this content, the term "local materials" refers to those materials easily obtainable from the immediate environment irrespective of where they are produced.

Types of Improvisation

Basically, two forms of improvisation can be identified. According to Igwe (2005), described "role substitution" as is when the original item generally requires little or no modification before it can be used to fulfill the new functions in an experimental setting, examples are; kerosene store as a burner, a glass tumbler as a beaker and such will reduce the cost for production. Computer monitor and central processing unit of a computer can be substituted using carton and polytene sheets. The second type of improvisation is described as "Role stimulation". In this case, actual construction of the apparatus or equipment is undertaken as an emergency measure either because the needed equipment is too expensive or not really available. An example is the use of local carpenter to construct computer keyboard, skeleton, weighting balance. Other instructional materials that can be

improvised include: imported charts, it can be substituted using cardboard sheet to draw the diagrams of the equipment not available with the aid of pencil or markers (coloured).

With specific reference to Nigeria, science curriculum emphasizes activity based teaching and student centered learning.

Raw materials that are available in the locality are explored and modified to produce instructional materials, by so doing we make science teaching more meaningful and lovely to both teachers and students (Omiko 2007).

Rationale of Improvisation

The need to improvise some materials or substitute for other is as old as experience science itself.

According to Ogeh (2007), rationale of improvisation includes the following:

1. It contribute to the achievement of our education objectives by providing opportunity to develop necessary science skills, attitudinal and practical skills needed to function effectively in the society as professional scientist, technologists or generalists.

2. Improvisation undertaken by the teacher enables him to rethink and research for cheaper, better and foster methods of making the teaching or leaning process easier for the students. This implies, it promotes creativity and self-reliance.

3. To some extent improvisation fills the vacuum created by lack of shortage of science equipment by providing a frame of reference on which students can key their attention during classroom activities.

4. Improvisation provides a cognitive bridge to lead students from obstruction and its attendant" mental indigestion" to a nodding acquaintance with reality, other writers refers to this as giving students the bread of living experience rather than the stone of abstract theory.

5. Situation where equipment are available but not affordable and / or where technical expertise for saving or repairing equipment is lacking, or space parts and replacement items are not readily obtainable, clearly score the need for improvisation.

Base on the above rationale, the educational benefits of improvisation of instructional materials for computer education cannot be for fetelied. Ideally, no effective science education program can exist without instructional materials. Form Jean Piaget's theory, it is known that in developing concepts, children go from the concrete to the abstract stages (Igwe 2003). Piaget was of the view that knowledge is not copy of reality. To known an object, event is not simply to look at it and make mental copy or image of it but to know an abject is to act on it and there is no other way of achievement this than by the use of instructional materials.

Improvisation provides a framework of references on which pupils can key their attention during classroom activities.

Role of Improvisation of Instructional Materials in Instruction

Though improvisation of teaching materials by teacher has been a long standing problem, yet works done in this have been fragmentary (Njoku, 1998). The proper use of instructional materials in the classroom requires more than a simple knowledge of general teaching methods and skills. It rather calls for teachers' proper orientation into the production of instructional materials. Furthermore, adequate educational curriculum as the current society trends not demands, cannot be effective if the implementers (the teachers) are lacking skills and methodology with which to teach the students.

For instance, Abba (1992) revealed that there is a strong positive relationship between the use of improvised instructional materials and achievement in education. He further stressed that schools where more teacher employed instructional materials or aids in teaching get better result than schools that do not do so. He recommended that teachers should make extensive use of teaching aids and where these aids are not available; the teachers should try to improvise, with the use of local raw materials, which provides stimulation or motivation of the students.

Anochie (1991), stated that science subjects are better learnt by doing and not by talking. Effective teaching and learning can only be possible through the use of adequate equipment or instructional materials.

Unachukwu (1990), in his study into the extent to which teachers improvised teaching aids in college of education found out that, generally apart from the chalkboard,

most of the teacher in the schools do not make adequate improvisation of instructional materials for teaching subjects in their various schools.

Also Onyejemezi (1987), quoting a Chinese saying said. " A look is worth a thousand words". This statement illustrates the value of teaching and learning materials in entrancing effective learning, she also said that, these materials do not achieve any of the attitude values on their own. Rather, than their usefulness depends on what the teachers make out of them. Intelligent handing of the improvised instructional materials in the classroom in necessary (Igwe 2003).

The Place of Computer in Education

In schools, computers are used to teach students in various subjects, to test them and grade them.

Computers services as an instructional materials for computer education.

The following are the place of computer in education.

1. Grading of students: grading of students' scripts especially in the objective questions can be done using the computer especially those utilizing optical mark readers.

2. Computer Assisted Instruction (CAI): In this aspect, the computers act as a teacher (i.e. replaces the teacher) in providing instruction to the learners. It involves the use of computers for direct instruction of students use application package known as computer aided learning (CAL) to learn most of their major subjects. Here the computer serves as the teacher to the students. The students follow set of instructions as being displayed on the computer. There after, the computer will drill the students with reasonable exercises in which they will be graded accordingly.

3. Computers Managed Instruction (CMI): Here; the computer is used as an assistant to the teacher in managing the educational process by assessing the students' capabilities and presenting a course instruction.

Teachers employ (CMI) to plan effective educational programmes in studies of C.M.I, the computer evaluates students' performance, diagnoses weakness and guides standards to appropriate instructional resources.

4. Time-tabling: Computer can help with time – table preparation. They are useful tools for re-allocation of rooms and facilities in emergencies. They help in preventing time dashes especially in large schools.

5. Payroll and Accounts: In large schools, general purpose accounts and payroll of teachers can be least using computers.

6. Publishing: computers can be used to prepare books, school magazines, report cards and other materials for printing or publishing.

7. Electronic Mail: This allows school is a particular network to send message to one another i.e. another school. It is cheaper than telephone calls.

8. Educational Gaming: Students can participate in computer games. During such games, students apply skills, which will enable them to strive to win.

9. Counseling: A computer serve the counseling needs of all students in a school, with a rich database, the computer can counsel a student on academic and non-academic problem

10. Planning: Spreadsheet to programmes can help plan admission to fit available or anticipated school resources. The computer can this assist on making projections for the number of teachers, classroom, textbooks and science equipment.

11. School secretarial duties: The computer can be used as an electronic typewriter with an added advantage of a vast memory. The mail merge facility of word processing packages can enable standard letters to be printed to individual parents of the students without having to re-type each letter. Such as typing a letter to be given to parents for parents teacher association {P.T.A}.

12. Record keeping: The computer can be used as an electronic filing cabinet. Using a database program, the principal or teacher can store and quickly retrieve information on students records, text, examination results, staff record, equipment inventory item bank for test and full biographical data of students..

In addition, computer in educational sector is used in delivering library services there by now making the students to know the range of books available in the library Abonyi (2008).

METHODOLOGY

The research design used is descriptive type of research. The study focuses strictly on computer science students in secondary schools in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

The population of the study comprises of all students in public secondary schools in Ado local government area of Ekiti State, Nigeria. Simple random sampling was used to select 25 students each from four secondary schools used to makes a sum total of 100 students.

The instrument used in collecting relevant data for this study was a close ended questionnaire. The instrument was subjected to validity and reliability mechanism. The instrumentation of the method used in collecting data for this study was a close ended questionnaire. The reliability coefficient of the instrument is 8.79. The model is the 4 likert scale model which has two section A and B. section A contain the personal data of the respondents. While the section B of the questionnaire contain items that related to the research topic. Three null hypotheses were generated to guide the study and tested at 0.05 level of significance. The data collected were analysed using Chi-Square (X^2) statistical analysis package.

Results and Discussion

Hypothesis 1

There is no significant difference in the extent of hardware components improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Table 1: Chi-Square Analysis of data on the difference in the extent of hardware components improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

S/N	ITEMS	X^2 Cal	X^2 tab	f	Remark
1	Monitor is always improvised when the standard monitor is not available				
2	Central processing unit is always improvised	5.72	7.82		**
3	Mouse is always improvised				
4	Printer is always improvised				

P > 0.05 ,   ** = Not Significant

Table 1 reveal that x^2 calculated was 5.72 and x^2 critical was 7.82. Since x^2 critical value was greater than x^2 calculated at 0.05 level of significance and at the degree of freedom 3, the Ho was accepted therefore the result was not significant. This shows that there is no significant difference in the extent of hardware components improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Hypothesis 2

There is no significant difference in the extent of software components of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Table 2: Chi-Square Analysis of data on the difference in the extent of software components of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

S/N	ITEMS	X^2 Cal	X^2 tab	f	Remark
1	Operating system is always improvised				

2	Program (instruction) is always improvised	6. 61	7. 82		**
3	Microsoft word package is always improvised				
4	Other relevant application software is always improvised				

P > 0.05 ,   ** = Not Significant

Table 2: reveal that x^2 calculate was 6.61 and x^2 critical was 7.82. Since x^2 critical value was greater than x^2 calculated at 0.05 level of significance and at the degree of freedom 3, the Ho was accepted therefore the result was not significant. This shows that there is no significant difference in the extent of software components of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Hypothesis 3

There is no significant difference in the basic accessories of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Table 3: Chi-Square Analysis of data on the difference in the basic accessories of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

S /N	ITEMS	X^2-Cal	X^2-tab	f	Remark
1	Surge protector is always improvised				
2	Uninterrupted power supply is always improvised	5. 12	7. 82		**
3	Cleaning suppliers are always improvised				
4	Other relevant accessories is always improvised				

P > 0.05,   ** = Not Significant

Table 3 reveals that x^2 calculate was 5.12 and x^2 critical was 7.82. Since x^2 critical value was greater than x^2 calculated at 0.05 level of significance and at the degree of freedom 3, the Ho was accepted therefore the result was not significant. This shows that there is no significant difference in the basic accessories of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

DISCUSSION

The findings in hypothesis 1: Table 1 reveal that x^2 calculated was 5.72 and x^2 critical was 7.82. Since x^2 critical value was greater than x^2 calculated at 0.05 level of significance and at the degree of freedom 3, the Ho was accepted therefore the result was not significant. This shows that there is no significant difference in the extent of hardware components improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

The findings on the research hypothesis 2 shows that software component of computer for computer education are difficult to improvise due to the low extent at which they are being improvised when there are no readymade ones available for the teachers to use during the teaching and learning process of computer. According to Ezeliona (2000), software is the working part of the computer, without the software, the physical computer equipment cannot function just like without the programmers, the television set cannot function or be of use. Specially, the software components that are improvised at low extent included both the system software (operating system) and the application software (word processor, spreadsheet package and corel draw package).

The most particular reason why they are scarcely improvised is because the computer software cannot be seen vividly and touched (Inyiama, 2000).

The findings in Hypothesis 3: Table 3 reveals that x^2 calculate was 5.12 and x^2 critical was 7.82. Since x^2 critical value was greater than x^2 calculated at 0.05 level of significance and at the degree of freedom 3, the Ho was accepted therefore the result was not significant. This shows that there is no significant difference in the basic accessories of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Table 3 for research hypothesis 3 shows that computer accessories like monitor, cables and connectors, keyboard drawers, mouse pads, surge protector are being improvised at great extent. This agrees with the act of improvisation. According to Igwe (2005) improvisation is the act of using attentive materials obtainable from the local personnel to facilitate instruction. Also, from this table, there are accessories that are improvised at a low extent, which are the uninterrupted power supply and power cords.

Education implication of the study

The hardware component of computer education are partially improvised at a greater extent and at a low extent. It is seen that, there is much effect and enthusiasm towards improvisation of hardware components of computer. This is due to the fact that, hardware component of computer are the physical devices of the computer system. Mbam (2000), the hardware component of computer can be seen vividly, hence it creates room for improvisation.

CONCLUSION

It is concluded from the findings of the study that:

1. There is no significant difference in the extent of hardware components improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

2. There is no significant difference in the extent of software components of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

3. There is no significant difference in the basic accessories of computer improvised in Secondary Schools in Ado Ekiti local government area of Ekiti State, Nigeria.

Recommendations

The following recommendations have made based on the findings of the study:

1. The governing councils in-charge of Ado Ekiti local government area should organize seminars, workshop, and conferences on improvisation to make the teachers resourceful enough to improvise the instructional material needed for computer education when the standard equipment is not readily available for effective

teaching. The instructional material includes the hardware component, software component and basic accessories of the computer.

2. Also, teachers should be encouraged to improvised by making resources available. Laboratories, storage area should be built in schools i.e. the government should make money available for any school that toned want to set up resources center for improvisation in their premises.

3. More so, the state education board should always inspect and supervise the teacher to ensure that they improvised instructional materials when the standard ones are not available during the teaching and learning process of computer. The curriculum planners should include the act of improvisation of instructional materials in the curriculum.

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