EFFECT OF ACTIVITY BASED METHOD ON SSII STUDENTS' ACADEMIC ACHIEVEMENTS IN COMPUTER SCIENCE IN SECONDARY SCHOOLS IN ENUGU URBAN OF ENUGU STATE

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Abstract
This paper investigates the effect of activity-based method on SSII students' academic achievement in computer science in secondary schools in Enugu urban of Enugu state. Activity-based method is a teaching/learning method in which both teachers and students are engaged in the learning processes. Activity based method provides students with a wide range of opportunities to gain not only subject knowledge effectively but also general, technical and academic skills by interacting with different learning activities and technologies. Students are also prepared as active citizens. Activity-based method is used extensively in most subject areas around the world as it is the better instructional method. The world in the 21st century has witnessed enormous changes in education due to the advance in science and technology. Traditional teaching and learning methods which were teacher-centered and based mainly on rote learning, have changed into student- centered structure over time and today schools in many countries have become places where active learning strategies are practiced. Active learning involves students doing things and thinking about what they are doing. Many methods have been developed so far in the frame of active learning such as applied learning, student-centered learning, cooperative learning, project-based learning etc. The placing of students in the center of learning whilst encouraging teachers to act as guides during the teaching process necessitates the use of activities in learning and teaching, which is commonly referred to as activity-based learning paradigm, in pedagogical parlance. The design of this study is quasi experiment. A total sample size of 105 students was used for the study. Also two unequal sample groups were used. Experimental (treatment) and control groups. Achievement test instrument was administered to the student in the two groups. At the end, the mean were calculated. More so, the t-test statistics was used to test the null hypotheses. At the end of the analysis it was discovered that activity based method is significantly more efficacious than the traditional method of teaching computer operation system to SSII students in Enugu Urban in Enugu State.
Keywords: Effect of activity based method; Approach on achievement in science; students in Senior Secondary Two (SSII).

Introduction

The learning environment will not be conductive for students unless/until a teacher devised a good strategy for teaching (Bonwell and Eison 1991). It has been observed that activity based method is the cornerstone of better intellectual development and it leads to critical pedagogy. This method gives emphasizes on the direct participation of the students in

learning process, the students get the right concepts while engaging themselves in different activities. Activity based teaching is an approach adopted by the teacher whereby activities are used to bring about effective learning experience. It is a method in which the child is actively involved both mentally and physically. Learning by doing is the main focus in this method, the more a student is actively involved in the learning process the longer he/she retains what he/she had learnt. Activity based method is student centered learning that is taught through many different activities. Types of activity base methods are as follows:

i.   Exploratory -gathering knowledge, concepts and skills.

ii.   Constructive - Gathering experience through creative works.

iii. Expressional -presentation.

Activity based teaching method acts as an active problem solver for the students. It enhances creative aspect of experience. This type of learning uses all available resources;, it provides varied experiences to the students to facilitate the acquisition of knowledge, experiences, skills and values. It builds the students self-confidence and develops understanding through works. It helps to develop happy relationship and interest in them. When we give an activity it is said to be the language of the child (Bonwell and Erison 1991).

Activity based method is a learner-centered-approach; its emphasis is on experimental learning. Activity based teaching promotes acquisition of social skills by providing opportunities for learner to work cooperatively, collaboratively and become creative students. It encourages the union of work and play and it uses child friendly educational aids to foster self-learning.

Activity based learning is a process whereby learners are actively engaged in the learning process, rather than "passively" absorbing lectures. It is based on the core premise that learning should be based on doing some hands on experiments and activities rather than just listening to lessons only. Activity-based method involves reading, writing, discussion, practical activities, and engagement in solving problems, analysis, synthesis, and evaluation.

In Activity-based method, Harfield, Davies, Heb, Panko Kenley (2007) postulated that students actively participate in the learning experience rather than sit as passive listeners. Learning/teaching activities if based on real life experience help learners to transform knowledge or information into their personal knowledge which they can apply in different situations. Harfied, et al (2007) quoting Prince (2004) assert that activity based method is different from traditional method of teaching on two points; Firstly, active role of students;

Secondly, collaboration among teachers/students. Suydam, Marlyn and Higgins (1977) define activity based method as the learning process in which students are actively involved in doing or in seeing something done". According to them, activity-based method "frequently involves the use of manipulative materials". Activity Based method helps learners to construct models that allow higher-order performance such as applied problem solving and transfer of information and skills. Activity-based learning is basically important in secondary school education in the teaching of applied subjects in which computer studies is one of them.

Statement of the Problem

Though activity-based teaching has been accepted as a paradigm for science education and is also reflected in some measures the textbooks developed at the national and state levels, it has hardly been translated to actual classroom practice. Activities tend to be regarded as a way to verify the ideas/principles given in the text rather than as a means for open-ended investigations. There is a general feeling that activity based method is expensive, takes more time that could be otherwise "fruitfully" used for "text based" teaching, and does not prepare the child for examinations and competitive tests. The concern about expenditure involved in activities/experiments could not be dismissed. Most schools cannot afford well-equipped science laboratories. However, it is certainly possible to design low cost activities and experiments using easily available materials. Thus cost should not be allowed to become an excuse for neglecting the very base of learning science.

However, the method of teaching-learning process adopted must be suitable to the age and mental ability of students' social norms and available resources in the environment. The method must be less of burden to learning and increasing the eagerness and happiness of school life. The teaching and learning of Computer Science in most classrooms face a lot of problems. Most of the teachers use the traditional teaching method that comprises, note taking and memorization. They do not make use of activity-based teaching strategies, where the learners play active role in the learning process this inability of the computer science students in the use of activity-based method might be the cause of poor performance in the subject at both teacher made examinations and Secondary School Certificated Examination (SSCE).

Studies by Make (2007) shown that Activity-based method which is student centered is effective in teaching and learning science. Over the last three decades, the framework for understanding the psychological basis of teaching and learning has shifted from teacher-centered to student-centered teaching and learning where the responsibility is rested on

learners for their own learning of science but most teachers prefer to use the traditional method and this might cause failure in performance. Thus this study is aimed at looking into the various activity based method on the performance of SS II students.

Purpose of the Study

The main purpose of the study is to find out the effect of activity based methods on SSII students' academic achievements in Computer Science in secondary schools in Enugu Urban of Enugu state.

The specific purposes are as follows:

i. To find out the mean achievement scores and standard deviation of students taught operating system using activity based method and traditional method as measured by the pre-administered test.

ii. To find out the mean achievement scores and standard deviation of students taught with activity based method and traditional methods as measured by the pre-administered test.

iii. To find out if activity based method is more efficacious than the traditional method in teaching computer operating system to SS2 students as measured by the post administered test.

Significance of the Study

The findings of the study are expected to provide basis for helping educational planners and curriculum designers to recommend among others; activity-based in the schools to improve teaching/learning situations currently existing in Senior Secondary Two (SSII). The computer science teachers will understand the usefulness of the findings in the teaching-learning process. The student& understanding of concepts in computer science/studies will improve through the use of activity based method.

Scope of the Study

The study was carried out in Senior Secondary Schools in Enugu urban of Enugu state. The study investigated the effect of activity based method in Senior Secondary Two (SS2) students' academic achievement in computer science. The activity based methods includes; laboratoryFpratica1, use of teaching aid, co-operative learning/small group learning and discussion in class. The covered the content operating system.

Research Questions

The study is designed to answer the following questions:

1. What are the mean achievement scores and standard deviation of students taught operating system using activity based method and traditional method as measured by the pre-administered test?

2. What are the mean achievement scores and standard deviation of students taught with activity based method and traditional method as measured by the post administered test?

3. Is activity based method more efficacious than the traditional method in teaching computer operating system to SS2 students as measured by the post administered test?

Hypothesis

Ho: Activity based method is not significantly more efficacious than the traditional method in teaching computer operating system to SS2 students in secondary schools in Enugu urban of Enugu state as measured by the post administered test.

Review of Related Literature

There are mixed findings of different researches about the effectiveness of activity based method. Suydan, Marilyn and Higgins (1977) reached on the conclusion that ABM in computer science is more effective than traditional method of teaching. According to Brophy (1995) students learn concepts in depth if these concepts are learnt in different contexts which may include classroom lectures, laboratory experiments, textbook readings etc. To familiarize students with scientific knowledge is one of the aims of science teaching so they can apply this knowledge in problem solving situations, (Carey & Smith, 1993). Science is more than collecting and manipulating data or memorizing knowledge. According to National Research Council (1996), it is a process of inquiry that requires asking questions, observing, data exploration and data manipulation. It requires learning how to apply and generalize scientific knowledge. Creating such learning environment requires engaging learners in different activities. Active engagement in learning activities develops conceptual understanding and motivates students to seek further information (Brophy, 1995).Hake (1998) found that activity based method significantly improves conceptual understanding of the Students in a science class. Magno et al. (2005) concluded that the classes receiving the 1esson with activity based method had significantly higher performance accuracy in the test and had higher' attitude as compared with the other classes who received instruction through traditional method.

Active learning is based on the premise that students learn best when they are actively involved in the learning process. Active learning "derives from two basic assumptions;

learning is by nature an active endeavour and different people learn in different ways" Meyers and Jones in Katleen (1999). Morable in Okwudishu (2011) activity based learning offers the following benefits: reinforces course content, develops team building skills, enhances learner's self-esteem, promotes participatory learning, allows for creative problem solving, and promotes the concept of discovery learning. Other benefits are, it energizes and invigorates the participants, strengthens learners bond, offers variety that accommodates diverse learning styles, allows for practical application of course content, enhances communication with diverse learning, offers an enjoyable and exciting learning environment, helps improve learners retention and motivation, provides an avenue for learners recognition, reward, and promotes fun.

As against traditional method Morable (2011) observed that in activity-based learning method; both the teacher and students are active in the teaching and learning processes, the students discover the formulae and concepts in computer science under the guidance of the teacher, retention and recall of concept are enhanced. Hence students taught using this method hardly forget the concepts.

Research Design and Methodology

This study adopted a non-equivalent quasi-experimental pre-test and post test research design. Quasi-experiment is an empirical study used to estimate the causal impact of activity based method on SSII student& in Enugu urban.

Method of Data Collection

The instrument was first administered to the two classes selected for the study. The students in experimental group was taught for two weeks by the researcher using activity based method of teaching (Laboratory/practical, co-practical, co-operative learning, use of teaching aids and discussion in the class), while the students in control group was taught by the researcher for two weeks using traditional method of teaching (lecture and demonstration). At the end of the instruction, the instrument was administered to the representative sample for post-test and the students were require to thick the correct answer from the options provided. The instrument was collected and scored.

The data collected was analyzed using mean and standard deviation. The research hypothesis was tested using t-test.

$$t_{cal} \frac{\overline{X_1} - \overline{X_2}}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Method of Data Analysis

Research Question 1

What are the mean achievement scores of students taught operating system using activity based method and traditional methods as measured by the pre-administered test?

Table 1: Mean achievement scores and standard deviation of SSII students taught operating system with activity based method and traditional methods as measured by the pre-administered test

Group	N	Mean ($\bar{X}$)	Stand. Deviation (S)
Experimental group	53	3.58	1.70
Control Group	52	3.56	1.67

The table 1 above shows the mean achievement scores of senior secondary school two computer science students taught operating system when activity based method was 3.58 and standard deviation 1.70 while the mean achievement of those taught with traditional method was 3.56 and standard deviation was 1.67.

Research Question 2

What are the mean achievement scores and standard deviation of students taught with activity based method and traditional methods as measured by the post administered test?

Table 2: Mean achievement scores and standard deviation of SSII students taught operating system with activity based method and traditional methods as measured by post administered test

Group	N	Mean ($\bar{X}$)	Stand. Deviation (S)
Experimental group	53	9.53	0.82
Control Group	52	7.40	1.62

Table 2 shows that the mean achievement scores of students taught with activity based method was 9.53 and standard deviation of 0.82 while the mean achievement scores of students taught with traditional method w 7.40 and standard deviation of 1.62.

Research Question 3

Is activity based method more efficacious than the traditional methods in teaching computer operating system in SSII students as measured by the post administered test?

Table 3: To find out if activity based method is more efficacious than the traditional methods in teaching computer operating system to SSII students as measured by the post administered test

Group	N	Mean($\bar{X}$)	Stand. Deviation (S)
Experimental group	53	9.53	0.82
Control Group	52	7.40	1.62

Results from table 3 above shows that the mean achievement score of students taught operating system with activity based method is 9.53 with standard deviation of 0.82, while the mean achievement scores of students taught operating system using traditional methods is 7.40 with standard deviation of 1.62 and the mean difference is 2.13.

From the result above it showed that students taught with activity based method scored higher than those taught with traditional method. So it could be said that activity based method is more efficacious the traditional method in teaching computer operating system to SSII students.

Hypothesis
Ho: Activity based method is not significantly more efficacious than the traditional method in teaching computer operating system to SSII students in Enugu urban in Enugu state, as measured by the post administered test.

T-test Analysis

The efficacy of Activity based method on teaching computer operating system

Group	N	Mean ($\bar{X}$)	Stand. Deviation (S)	∝	DF	T_{cal}	T_{ev}	Decision
Experimental Group (n_1)	53	9.53	0.82					
Control group n_2	52	7.40	1.62	0.05	104	6.83	1.99	Reject H_0

Decision rule: Reject Ho if t_{cal} > tev at a level = 0.05 otherwise accept.

From the result of the table above, since t-cal = 6.83 > tcv =1.99 the null hypothesis is rejected at a-level 0.05.

Conclusion: Having rejected the null hypothesis the researcher concluded that activity based method is significantly more efficacious than the ration traditional method in teaching computer operating system to SSII students in Enugu urban in Enugu State.

Conclusion

Activity based learning method refers to several models of instruction that focus the responsibility of learning on the learners. Learning is not a spectator sports, as students do

no learn much just listening to teacher, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write reflectively about it, relate it to past experiences and apply it to their daily lives. They must make what they learn part of themselves.

Contemporary research on effective computer science teaching focuses on instruction that promotes student's involvement and activity. The new instructional pedagogy requires teachers to move away from teaching and move towards activity-based teaching. Most teachers in the school system often teach the computer studies with the "telling method". This involves making lesson notes, passing on the information to the students and then evaluating the students. The teacher becomes very "active" while the students are very "passive". This does lead to a lasting learning on the part of the students. Students do not easily understand and comprehend the lessons taught. This makes students to forget the lessons taught therefore perform poorly in the examinations. Active learning implies strategies where the students touch, feel, participate, discover reason, deduce, infer facts and ideas in the learning process. This could be achieved using the following strategies in the computer science classroom: appropriated laboratory/practical work, use of teaching aids, cooperative learning or small group learning, discussion in class, assessment of the effect of activity based learning methods, classroom environment, students involvement in the learning process, teacher's role, scope for creativity etc.

Activity based teaching provide opportunity for measuring learning through experience, direct observation and participation of students. The activity based method provides opportunity for students to work in a co-operative manner. Attainment of competencies can be possible through activity based method in teaching learning process. Enhancing the quality of secondary education is a vital key to improving the teaching method in schools. If schools are able to offer to the students' diverse opportunity to learning by doing various activities then the school will be an attractive place for the students.

Recommendations

The need for activity based method on academic achievement of secondary school students should be embrace by individuals, teachers, students, government so that teachers and students will be empowered in activity based method. To achieve this, practicing teachers in secondary schools should be professionally trained and qualified to diversified curricular, computer science teachers should be encourage to adopt the use of activity based method in their teaching, government should assist teachers by sponsoring or

subsidizing their attendance to conferences and workshops so that they could update their

instructional knowledge in line with contemporary educational demands.

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