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ASSESSMENT OF THE EXTENT OF IMPROVISATION IN TEACHING AND LEARNING BASIC SCIENCE IN UPPER BASIC SCHOOL LEVEL IN ANAMBRA EAST LOCAL GOVERNMENT AREA OF ANAMBRA STATE

by

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Abstract
This study sought to investigate th**e** extent of improvisation in teaching and learning basic science in upper basic school in Anambra East Local Government Area of Anambra State**.** The study was guided by two research questions and it adapted a descriptive survey research design. The sample involved 30 teachers selected through purposive sample technique and 370 students selected through simple random sampling techniques from the population of 1756 (teacher and student) from government owned senior secondary schools in Anambra East Local Government Area of Anambra State. A 25-item questionnaire developed by the researcher and validated by experts was used to collect data for the study and reliability index of 0.82 was realized using Pearson product movement correlation coefficient. Data obtained were analyzed and reported using mean and standard deviation. The findings indicated among others, that despite the challenges such as lack of professional training some teachers encounter in the provision of improvisation instructional materials during teaching and learning that high number of teachers sees improvisation as inevitable if the real instructional materials are not available and thus, improvised instructional materials for effecting teaching and learning to take place. It facilitates student understanding of the subject matter faster, helps student to concretized some abstract concept and develop high retentive memory amongst others. Therefore, it was concluded that improvised instructional materials foster student academic gains. The effective utilization of improvised instructional materials should be sustained. Based on the findings, workshop and seminars should be organized for serving basic science teachers on improvisation and utilization of essential material resources in the teaching and learning of basic science, teachers who carries out improvisation should be rewarded and motivated adequately. Only this would ensure *programme effectiveness.*

Keywords: Improvisation, Basic Science, Instructional Materials

Introduction

Basic science developed scientifically literates' individuals that are concerned with high competence for rational thoughts and actions. Among its objectives in this country according to Maduekwe (2006), includes the need to prepare students to observe and explore the environment, explain simple natural phenomena, develop scientific attitudes including curiosity, critical reflection and objectivity, apply the skills and knowledge gained through science to solve everyday problems in the environment, develop self-confidence and self -reliance through problems solving activities in basic science. According to Ogunleye (2006), basic science is dynamic human activity concerned with understanding the working of our world. This understanding helps man to know more about the universe. Without the application of science, it would have been difficult for man to explore the other planets of the universe. To achieve this scientific fit, teachers of basic science in upper basic school level need to be equipped with adequate instruction resources for effective curriculum implementation. Unfortunately, instructional materials are sometimes lacking, not available or not suitable. When the instructional materials are not readily available teachers resort to improvisation.

Improvised instructional materials are teaching and learning instructional materials that are used in the absence of the real, original or delicate objects to bring about the same learning effect that the real or complicated instructional materials would have brought. These instructional materials can be invented or produced from readily available materials within the environment. Eshiet (2001) explained improvisation with respect to Science teaching to mean the sourcing, selection and deployment of relevant instructional element of the teaching and learning processes in the absence or shortage of standard or accredited teaching and learning elements for a meaningful realization of specified educational goals and objectives. Balogun (2012) sees improvisation as the act of using alternative materials or equipment obtained from the local environment or designed by the teacher or with the help of local personnel to facilitate instruction. In practical terms, it means the provision of an "***alternative best***" which essentially must serve the purpose of the original instructional materials.

The importance of instructional materials in the teaching and learning process cannot be over- emphasized; hence they make teaching and learning more lively, meaningful and understandable. In support of the above fact, Owolabi (2013) maintained that the use of improvised instructional materials during teaching and learning of basic science makes some abstract concepts in basic science to be concrete, hence facilitate, students understanding of the subject matter. According to Kay (2008) improvisation stimulates the student desire to learn, it assist learning process by making assimilation and memorization of the subject matter easy. Onyeachu (2010) noted that as a matter of fact, to motivate the students to learn effectively, instructional materials are at head in such activity; and no learning is possible without instructional materials. It encourages class participation since majority of the raw materials can be sourced by the students themselves, motivate learners through participatory

activities during production and arouse the interest of the learners because they are made from raw materials they see daily in their environment. Teachers should improvise instructional materials to enhance the teaching and learning of science (Osei- Himah, 2018).

In spite of the emphasis on the use of instructional materials in the teaching and learning process, research has shown that science teachers at the basic level teach without the use of instructional materials like acid-base indicators, acids, bases, microscope, etc. for the simple fact that they are not available in the schools. They teach without instructional material because they could not improvise instructional material which could be as result of professional training. Basey (2012), identified two main constraints militating against the successful improvisation of science equipment. These are the technical and human factors respectively. The technical factors relate to the question of degree of accuracy and precision that is possible with the improvised equipment's, the human factors related to the teacher's skills in developing the resources while providing the appropriate learning experience to the learners. It is against this background that this study was conceived.

In view of the above, the main purpose of this study was to investigate the extent of improvisation utilization in teaching basic science in upper basic school level in Anambra East Local Government Area of Anambra State. More specifically, the study seeks to;

1. Determine the extent of effect improvisation of instructional materials are to student's academic achievement;
2. Ascertain the extent teachers in the upper basic schools improvise instructional materials which are not readily available.

In other to achieve the specific objective of this study, the following research questions guided the study:

1. What are the extent of effect improvisation of instructional materials student's academic achievement?
2. What extent do teachers in the upper basic schools improvise instructional materials which are not readily available?

Method

This study adopted descriptive survey research design to investigate the extent of improvisation utilization in teaching and learning basic science in upper basic school educational level in Anambra East Local Government Area of Anambra State. The design has advantage of producing good amount of responses from a wide range of people. Another reason why descriptive research design was used is that it has the potential to provide a lot more information from large sample of individuals. The population of this study comprised 1756 (teacher and student) from the government owned senior secondary schools in Anambra East Local Government Area of Anambra State. Sample size of 400 (teacher and student) was established using Yan (1957) method. Sample consisting of 30 teachers were selected through purposive sample techniques and 370 students were also randomly selected among the targeted group using simple random sampling techniques drawn from the government owned senior secondary schools in the education zone. Data were collected using a

structured questionnaire developed by the researcher. The instruments were validated by experts of basic science and experts in the Department of Measurement and Evaluation for face and content validation. Following their recommendations, the final draft of the instrument was produced. The reliability of the instrument was established as 0.82 using the Person's Product Moment Correlation Coefficient. The instruments were administered to the 400 respondents using a face to face method. The numbers of item question raised were 25. The item questions raised were acquired from the literature review and also in line with the research questions. The Likert rating scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) were used. The scale is weighted 4, 3, 2, and 1 respectively. For decision on the result in table any mean less than 3.00 are taken as low while the rest are as high. The data collected was analyzed using mean and standard deviation.

Results

Research question one: What are the extent of effect improvisation of instructional materials are to student's academic achievement?

Table 1: Mean and standard deviation on the extent of effect improvisation of instructional materials are to student's academic achievement

S/No:	Questionnaires items	N	$\bar{X}$	STD	Decision
1	It helps student to develop innovation mindset	400	4.15	0.93	High
2	It stimulates student to develop scientific skills	400	4.12	0.89	High
3	It helps student to concretized some abstract concept	400	4.15	0.90	High
4	It encourages high degree of retention among students	400	4.23	0.99	High
5	It facilitates student understanding of the subject matter faster	400	4.15	0.92	High
6	It helps student to develop technological awareness	400	4.10	0.85	High
7	It stimulates the student desires to learn	400	4.13	0.89	High
8	It encourages student towards the development of creative ability	400	4.14	0.89	High
9	It makes teaching and learning lively	400	4.22	0.95	High
10	It encourages the active participation of learner	400	4.18	0.92	High
11	It stimulates student strength of enquiry	400	4.13	0.87	High
12	It afford student the opportunity to become familiar with their environment	400	4.18	0.91	High
13	It helps student to develop investigate skills in science	400	4.18	0.93	High
14	It helps student to develop imaginative skills	400	4.23	0.95	High
15	It helps student to develop manipulative skills	400	4.12	0.90	High
16	It boasts student self-confidence	400	4.23	0.98	High

The Table 1 shows that items number 1 to 16 were all high. This revealed that improvisation of instructional materials during teaching and learning basic science is beneficial to student learning. It facilitates student understanding of the subject matter faster, helps student to concretized some abstract concept and develop creative skill amongst others as depicted by the result. The provision of improvisation instructional materials during teaching and learning when the real instructional materials are in short supply or not available should be encouraged. Thus, improvised instructional materials foster student academic performance.

Research Question Two: What extent do teachers in the upper basic schools improvise instructional materials which are not readily available?

Table 2: Mean and standard deviation on extent do teachers in the upper basic schools improvise instructional materials which are not readily available

S/No:	Questionnaires Items	N	$\overline{X}$	STD	Decision
17	Some teachers see improvisation as inevitable if the real instructional materials are available	400	4.19	0.91	High
18	Some of teachers sees improvisation as a waste of time and energy	400	4.15	0.93	High
19	Some teachers lack the professional training	400	4.13	0.90	High
20	Some teachers lack the ability to identify local material for improvisation	400	4.15	0.90	High
21	Some teachers hardily improvised instructional resources	400	4.19	0.94	High
22	Unavailability of tools sometimes posed challenge on making improvisation available by the teacher	400	4.15	0.90	High
23	Sometimes poor welfare package effects teachers motivation in making improvisation available for teaching and learning	400	4.12	0.86	High
24	Large class size sometimes posed a challenge on the use of improvisation materials	400	4.22	0.98	High
25	Sometimes inability of some teachers to adapt in an unfolding event in science teaching becomes a barrier	400	4.13	0.90	High

The Table 2 shows that items number 17 to 25 were all high. This revealed that majority of teachers that teaches basic science in the upper basic school level improvised instructional materials to their students as indicated by the result. This observation shows that despite the challenges such as lack of professional training some teachers encounter in the improvisation of instructional materials during teaching and learning that high number of teachers sees improvisation as inevitable if the real instructional materials are not available and thus, improvised instructional materials for effecting teaching and learning to take place.

Discussion of the Findings

The overwhelm benefit of improvisation of instructional materials in place of real instructional materials is a widely acknowledged fact and thus, its usage should be sustained in our schools. This claim was confirmed with the result in Table1 of this study which revealed that improvisation of instructional materials during teaching and learning of basic science foster student academic gains. It facilitates student understanding of the subject matter faster, helps student to concretized some abstract concept and develop high retentive memory amongst others as depicted by the result. This is in line with Owolabi (2013), he maintained that the use of improvised instructional materials during teaching and learning of basic science makes some abstract concepts in basic science to be concrete, hence facilitate students understanding of the subject matter. According to Kay (2008) improvisation stimulates the student desire to learn, it assist learning process by making assimilation and memorization of the subject matter easy. Onyeachu (2010) noted that as a matter of fact, to motivate the students to learn effectively, instructional materials are at head in such activity; and no learning is possible without instructional materials.

Again, in the Table 2, the findings revealed that revealed that majority of teachers that teaches basic science in the upper basic school level improvised instructional materials to their students as indicated by the result. This observation shows that despite the challenges such as lack of professional training some teachers encounter in the improvisation of instructional materials during teaching and learning that high number of teachers sees improvisation as inevitable if the real instructional materials are not available and thus, improvised instructional materials for effecting teaching and learning to take place. This is in line with (Osei-Himah, 2018), teachers should improvise instructional materials to enhance the teaching and learning of science.

Conclusion

It was discovered that improvised instructional materials bring the same meaning as compared to the originally produced instructional materials and thus, many teachers utilized improvised instructional materials in the teaching and learning of basic science at upper basic school level. It facilitates student understanding of the subject matter faster, helps student to concretized some abstract concept and develop high retentive memory amongst others. Thus improvised instructional materials foster student academic gains. Therefore, effective utilization of improvised instructional materials should be sustained.

Recommendations

Based on the findings, the following recommendations were made;

1. Workshop and seminars should be organized for serving Basic Science teachers on improvisation and utilization of essential material resources in the teaching and learning of Basic Science;
2. Teachers who carries out improvisation should be rewarded and motivated adequately;
3. Governments should take sole responsibility of supplying and procurement of necessary instructional materials and facilities, they should equally ensure high maintenance culture by the administrators;
4. Employment of science and mathematics teachers should not be based on paper qualification but also acquired knowledge and the level of practical skills should be tested;
5. Both the Federal and State ministries of Education should ensure that there is the availability of both human and material resources before the take-off of any school or giving approval for the take-off of schools.

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