EFFECT OF STUDENTS' CONSTRUCTED INSTRUCTIONAL MATERIALS ON THEIR ACADEMIC ACHIEVEMENT AND RETENTION IN BASIC SCIENCE IN ORON LOCAL GOVERNMENT AREA

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ABSTRACT

The study investigated the effect of students' constructed instructional materials on their academic achievement and retention in Basic Science in Oron Local Government Area. To achieve the objectives of the study, five null hypotheses were stated. The study adopted a quasi-experimental design, specifically a non-randomized and non-equivalent control group. A sample of 192 students in two intact classes was selected for the study using the purposive sampling technique. Two researcher-made instruments containing 20 items each were used for the study. The instruments were: Basic Science Achievement Test (BSAT) and Basic Science Retention Test (BSRT). The instruments were trial-tested once. The result of Pearson Product Moment Correlation (PPMC) shows that BSAT and BSRT have a reliability coefficient of 0.76. The students were guided by the research assistants to conduct the experiments using: connecting wires; battery; key; rheostat; torch; bulbs; voltmeter; ammeter; resistors; and ohmmeter while teaching the topic. An Analysis of Covariance (ANCOVA) was used to test research hypotheses. The results obtained show a significant difference between the mean achievement and retention scores of basic science students taught electrical energy using students' constructed instructional materials. The results also showed a significant difference between the mean achievement and retention scores of students by gender. It is recommended that teachers should adopt students' constructed instructional materials to improve students' achievement and retention when the materials are inadequate or non-available.

KEYWORDS: Students, Constructed Instructional Materials, Academic Achievement, Retention, Basic Science, and Oron Local Government Area

Introduction

The use of instructional materials is not new in the teaching and learning of science. Early scientists were able to discover many important things, as well as teach science efficiently using equipment and other resources produced by them. The prevalent goal of science educators and scientists is that practical use of equipment in science education will increase the teaching of scientific principles and their application in the real world. Modern science teaching therefore emphasizes "learning by doing using hands-on-approaches". The teaching goals are achieved by the teacher through giving the right type of instruction to students. No matter how well developed and comprehensive a curriculum is, its success depends, to a large extent, on the quality of the teachers' implementation of instructional delivery. The realization of these goals can be hindered by the non-availability of teaching resources that enhance effective teaching and learning. Teaching of science, therefore, requires the use of appropriate instructional materials that will enable the learners to understand, retain, and practice the concepts they have learnt.

Martin (2012) regards instructional materials as anything that can assist the teacher in facilitating teaching by making the lesson clearer to the learners and stimulating the students' interest in learning. Instructional materials are seen as those alternative channels of presentation needed for the teaching and learning of school subjects to promote the teacher's efficiency and improve the students' academic achievement (Amadioha, 2009). Instructional materials make learning more interesting, rewarding, practical, realistic and appealing. When students are given a chance to learn through their senses, they learn faster and easier. The use of instructional materials therefore provides the teachers with an interesting and compelling platform to convey information to the learners. Ibeneme (2000) posits that instructional materials are those instructional aids used for practical teaching and demonstration of instructions in a classroom situation by students and teachers. Udo (2006) explained instructional materials as all the resources which facilitate the acquisition of skills and knowledge by learners. Yusuf (2009) also described instructional materials as teaching materials used by the teacher to pass information to students in real-life situations.

Instructional materials, therefore, contribute to the effective and permanent transfer of learning. It helps to increase confidence on the part of the teacher during the course of instructional delivery. These materials supply the basis for conceptual thinking and reduce verbalism. It produces a high degree of interest, continuity of thought, self-activity, and enhances growth and meaningful vocabulary development. It also serves as a channel through which messages, information, ideas, and knowledge are disseminated more easily. The teacher speaks less while conveying a more effective and meaningful instructional message in the classroom (Ogbandani, 2008). Therefore, a teaching and learning situation is not complete without the appropriate utilization of instructional materials, particularly in the sciences. It is evidently clear that most public schools lack instructional materials and teachers therefore adopt the "talk-chalk" method as the only alternative. Enohuean (2015) stressed that a professionally qualified science teacher, no matter how well trained, would be unable to put his ideas into practice if the school setting lacked the instructional equipment and materials necessary for him or her to translate his competence into reality.

Through the effective and efficient utilization of instructional materials, science has contributed immensely to the development of the modern world. For instance, life has been made a lot easier for man because of the advancement of science and technology. Through science and technology, man has been able to better understand his environment, and this has enabled him to manipulate the conditions of his environment to suit his own benefit. Application of science has also made it possible for man to acquire his desired needs easily. Ogunleye (2008) states that science is a dynamic human activity concerned with understanding the workings of our world. This understanding helps man to know more about the universe. Without the application of science, it would have been impossible for man to explore the other planets of the universe, and also, the awareness of the existence of other planets would not have been realized. Acquiring scientific knowledge is gained through instructional delivery.

In basic science, students are exposed to several methods of teaching and learning. These include demonstration, lecture, discussion, guided discovery, laboratory and activity-based learning depending on the aspect the teacher want to utilize (FME, 2013). Basic Science is a subject that introduces students at junior secondary schools in Nigeria to the rudiments of science and technology. According to the Federal Ministry of Education (2013), basic science and technology is defined as the aspect of education which leads to the acquisition of practical and applied skills as well as basic scientific knowledge.

The poor academic achievement of students in basic science in junior secondary school is attributed to many factors such as the subject content, use of the lecture method, poor laboratory facilities, poor retention ability of students, inadequate number of learning facilities for teaching and learning, among others (Usman, 2002, Usman, 2007 and Dye, 2011). Although instructional materials could facilitate meaningful learning in basic science, they are rarely used, whereas their utilization is considered a means of teaching for improving cognitive experience. A good number of expected learning outcomes cannot be realized in basic science at the JSS level as a result of the non-availability of instructional materials (Nwagbo, 2008). There has been poor achievement in basic science students in the Junior Secondary School Certificate Examination (JSCE). The Basic science chief examiners' reports have in recent years indicated a steady decline in candidate performance in basic science (Sadi, 2011).

The aim of teaching and learning some concepts in basic science while making use of instructional materials is to establish student-oriented behavioral objectives and thereby making learning more meaningful. Meaningful learning is a product of retention, and retention could be explained as the process or ability to retain and remember things, concepts, and experiences learned by an individual at a later time. Retention occurs when experiences are coded in the memory. According to Bichi (2002), appropriate coding of incoming information provides an index that may be consulted so that retention takes place without an elaborate search in the memory lane. The level of retention is determined by the type of material used in the teaching and learning of basic science concepts. Gbodi and Laieye (2006) revealed that instructional materials have the potential to enhance the quality of science teaching by retaining concepts learned, arousing student interest, stimulating thinking and clarifying concepts. From the numerous conditions at the time of learning, they can either facilitate or interfere with its success. In other words, instructional materials can enhance retention or facilitate forgetting (Bichi, 2002). There are numerous factors that may affect retention of learning materials, among which are inappropriate instructional materials, learning methods, and instructional delivery style.

Gender issues and academic achievement have become important burning issues among researchers. There is an acknowledged problem of female underachievement when compared with their male counterparts, apparently under equivalent conditions. This problem of female underachievement appears to be more pronounced in science and mathematics (Nworgu, 2014). The term "gender" refers to the socially ascribed roles, responsibilities, and opportunities associated with women and men, as well as the hidden power structures that govern relationships between them. Gender, in essence, is a term used to emphasize men and women, but more specifically the unequal and inequitable treatment they receive in society (Igwe, 2013).

Gender is a parallel and socially unequal division into masculinity and femininity. Gender bias remains the main focus of concern among science educators (Eze, 2010). In Nigeria, gender bias is still prevalent. It has persisted even within the science classroom. Some research studies have shown contradictory evidence in male and female students' achievement and retention in science.

Anaso (2008) observed that there are a number of conflicting conclusions about gender-related differences in achievement in basic science. Some view gender as a relevant factor in performance, while others feel that no difference exists between the sexes in terms of academic performance. Researchers such as Opeyene and Opolot (2005) posited that boys achieve better than girls in mathematics and science and that there is a comparable difference between achievement of boys and girls. Adegive (2005) attributes the difference to the learning processes that take place at home and reports that boys get better attention and results in mathematics and science than girls. Okeke (2002) observed that the consequences of gender stereotyping cut across social, economic, political, and educational strata, especially in the area of science and technology. However, Okebukula (2002), Longe and Aeledeji (2003), Yoloye (2004), Ezrim (2006), and a host of other researchers noted that gender has an impact on science education. Male supremacy and gender stereotyping are factors identified to influence occupational choice. Hence, Longe and Aeledeji (2003) opine that science and technology are male-dominated occupations and careers. Female shy away from scientific and technological fields. Boys, therefore, appear to have a natural positive attitude towards technical and science subjects while girls show a negative attitude. This negative attitude appears to be due to the acceptance of the myth that boys are better in science subjects than girls. Babjide (2010) further admitted that science subjects such as physics and chemistry are given a mescaline outlook by educational practitioners.

Simmons (2008) posited that learning takes place through the interaction students have with their peers, teachers, and the learning environment. In this approach, learning materials serve as a social environment, which will maximize the learner's ability to interact with others through discussion, collaboration, and feedback. The National Research Council (2011) stated that the key to success in basic science is not just providing students with a science immersion experience but also enabling them to conceptualize science as a creative process of thinking rather than a defined body of knowledge. The most natural learning is realized through personal experience (Kristina and Pavol, 2012).

Statement of the Problem

The declining rate of students' academic achievement in basic sciences, both in internal and external examinations, has caused serious concern to educators, researchers, and examination bodies (Dye, 2011) and Usman, (2002). Despite efforts to improve student's academic achievement in Basic Science, yet the subject remains a persistent failure. This could be as a result of non-availability and inadequate instructional materials. This could also be as a result of the consistent use of standard instructional materials by basic science teachers. The problem before these researchers is: will the use of students' constructed instructional materials enhance their achievement and retention of electrical energy content?

Purpose of the Study

The general purpose of the study is to investigate the Effect of Student Constructed Instructional Materials on their academic Achievement and retention in Basic Science in Oron Local Government Area. Specifically, the study intends to investigate the following:

i. Determine the mean achievement scores of students taught the concept of electrical energy using students' constructed instructional material and those taught using teachers' constructed materials?

ii. Determine the mean retention scores of basic science students taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials?

iii. Determine the mean achievement scores of students by ability level taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials?

iv. Determine the mean achievement scores of students by gender taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials?

v. Determine the mean retention score of students by gender taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials?

Research Hypotheses

i. There is no significant difference between the mean achievement scores of students taught the concept of electrical energy using students' constructed instructional material and those taught using teachers' constructed materials.

ii. There is no significance difference between the mean retention scores of basic science students taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials

iii. There is no significant difference between the mean achievement scores of students by ability level taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials.

iv. There is no significant difference between the mean achievement scores of students by gender taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials.

v. There is no significance difference between the mean retention score of students by gender taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials.

Research Method

Quasi-experimental design was adopted for the study. Specifically, the per-test post-test equivalent group design was employed in this study. A quasi-experimental design is a type of experimental design that does not provide full control over extraneous variables primarily because of the lack of random assignment of subjects to group (Udoh and Ndem, 2003). However, the decision possesses internal consistency control through pre-test post-test arrangement. This design is appropriate for the study because it involves intact class.

The design is presented symbolically as;

R O_1 x O_2

R O_3 O_4

Where R is randomization

O_1 is pre-test of experimental group

O_3 is pre-test of control group

O_2 is post-test of experimental group

O_4 is post-test of control group

X is experimental treatment

The study was conducted in Oron Local Government Area of Akwa Ibom State. Oron is one of the thirty-one (31) Local Government Areas of Akwa Ibom State. Oron is situated in latitude 5^o North and Longitude 9^o East at the right bank of the lower estuary of the Cross River. It situates between Mbo Local Government Area in the East and Okobo Local Government Area in the North. Oron town is the third largest city in Akwa Ibom State after Uyo and Eket. It has an area of 70km^2 and population of (250,000) people living within the city. Lying on the Cross River, Oron has a sea port and Maritime Academy of Nigeria. The predominant occupation is fishing and farming. The city is rich in oil and natural gas. The people have unique culture and tradition which is expressed in Ekpo, Abang, Edeme Awan Nkwuho. Three co-educational Secondary Schools and two single sex Secondary Schools are in Oron Local Government Area of Akwa Ibom State. The researchers chose the area for the study because they are quite familiar with educational problems in the study area.

The population size of this study comprises of all the Junior Secondary Three (JSS3) students in public co-educational secondary schools in Oron Local Government Area of Akwa Ibom State for 2019/2020 academic session estimated at 1250 JSS 3 students.

The sample size of 192 JSS 3 students were used for the study. Purposive sampling technique was used to select two co-educational secondary schools for the study. The two schools were later assigned into experimental and control groups by balloting.

The instrument for data collection in this study was Basic Science Achievement Test (BSAT) and Basic Science Retention Test (BSRT). The instrument consisted of 50 multiple-choice question lettered A-D. The instrument was developed by the researchers and the items were drawn from Basic Science and Technology curriculum for JSS3 (NERDC, 2012). Each correct answer carries two marks. The test instrument, Basic Science Achievement Test (BSAT) and BSRT) with the marking scheme were validated by two lecturers in Faculty of Education, University of Uyo to ensure face and content validity. The validators assessed the content for accuracy, clarity and level of phrasing of the test items. All corrections, comment and suggestions were incorporated into the final draft of the research instrument which was produce using the test-blue print.

To ensure reliability of the instrument, it was subjected to trial testing on thirty (30) JSS 3 students who did not take part in the main study. Pearson Product Moment Correlation (PPMC) was used to established the reliability coefficient that yielded coefficient index of 0.76. Hence the instrument was considered suitable and reliable for data collection. The control group was taught the concept of electrical energy using teacher constructed instructional materials while experimental group received experimental treatment (construction of electric circuits) and was taught using the materials constructed by them. In order to account for possible difference in the overall achievement, and retention. The ability level between the groups that took part in the construction of instructional material and those who took part in the construction. Pretest was administered to the groups and the results was used as covariates. Post-test was administered to the students after teaching them the concept of electrical energy by the research assistants for the period of two weeks. After two weeks, retention test was administered to the groups by the researchers and research assistants. This enables the researcher to determine the entry behavior of the students and to determine whether the two groups to be compared are equivalent. Experimental group received treatment and was taught using the materials constructed by them while the control group was taught using the teacher made instructional material constructed by the researchers. Posttest was administered to the two groups. After two weeks, retention test was administered to the two groups and results collected for analysis.

Analysis of covariance (ANCOVA) was used to test research hypotheses at 0.05 level of significant.

TABLE 1: Analysis of Covariance (ANCOVA) of the significant difference between the mean achievement scores of students in experimental and control groups.

Source	Type III sum of squares	df	Mean Square	F	P-value
Corrected model	1469.480[a]	2	734.740	102.275	.000
Intercept	2964.741	1	2964.741	412.690	.000
Pretest	22.975	1	22.975	3.198	.075
Methods	1454.879	1	1454.879	202.518	.000
Error	1357.765	189	7.184		
Total	33861.000	192			
Corrected total	2827.245	191			

a. R Squared = .520 (Adjusted R Squared = .515)

The result in Table 1 showed that an F-ratio of 202.518 with an associated probability value of 0.000 was obtained with regards to the difference between the mean achievement scores of students taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials. Since the association probability of 0.000 was less than 0.05, the null hypothesis one which states that there is no significant difference between the mean achievement scores of students taught the concept of electrical energy using students' constructional materials was rejected. This implies that there is a significant difference between the mean achievement scores of students taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials.

TABLE 2: Analysis of Covariance (ANCOVA) of the significant difference between the mean retention scores of students in experimental and control group.

Source	Type III sum of squares	df	Mean Square	F	p-value
Corrected model	1396.532[a]	2	698.266	77.572	.000
Intercept	3044.422	1	3044.422	338.213	.000
Pretest	31.199	1	31.199	3.466	.064
Methods	1374.995	1	1374.995	152.752	.000
Error	1701.280	189	9.000		
Total	35702.000	192			
Corrected total	3097.812	191			

a. R Squared = .451 (Adjusted R Squared = .445)

The result in Table 2 shows that an F-ratio of 152.752 with an associated probability value of 0.000 was obtained with regards to the difference between the mean retention scores of students taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials. Since the associated probability of 0.000 was less than 0.05, the null hypothesis two which states that there is no significant difference between the mean retention scores of students taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials was rejected. This implies that there is a significant difference between the mean retention scores of students taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials.

TABLE 3: Analysis of Covariance (ANCOVA) of the significant difference between the mean achievement scores of students by their ability level in experimental and control group.

Source	Type III sum of squares	df	Mean Square	F	P-value
Corrected model	1623.799[a]	6	270.633	41.603	.000
Intercept	2901.779	1	2901.779	446.077	.000
Pretest	21.419	1	21.419	3.293	.071
Methods	1368.824	1	1368.824	210.423	.000
Ability Level	129.689	2	64.845	9.968	.000
Methods*Ability Level	25.170	2	12.585	1.935	.147
Error	1203.446	185	6.505		
Total	33861.000	192			
Corrected total	2827.245	191			

a. R Squared = .574 (Adjusted R Squared = .561)

The result in Table 3 shows that an F-ratio of 9.968 with an associated probability value of 0.000 was obtained with regards to the difference between the mean achievement score of students by their ability level those taught the concept of electrical energy using students by their ability level those taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials. Since the associated probability of 0.000 was less than 0.05, the null hypothesis three which states that there is no significant difference between the mean achievement score of students by their ability level those taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials was rejected. This implies that there is a significant difference between the mean achievement score of students by their ability level those taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials.

TABLE 4: Analysis of Covariance (ANCOVA) of the significant difference between the mean achievement scores of students by gender in experimental and control group.

Source	Type III Sum of squares	df	Mean Square	F	p-value
Corrected model	1678.629[a]	4	419.657	68.322	.000
Intercept	2870.204	1	2870.204	467.283	.000
Pretest	28.601	1	28.601	4.656	.032
Methods	1434.021	1	1434.021	233.465	.000
Gender	171.596	1	171.596	27.937	.000
Methods* Gender	37.232	1	37.232	6.062	.015
Error	1148.615	187	6.142		
Total	33861.000	192			
Corrected total	2827.245	191			

a. R Squared = .594 (Adjusted R Squared = .585)

The result in Table 4 shows that an F-ratio of 27.937 with an associated probability value of 0.000 was obtained with regards to the difference between the mean achievement score of basic science students by gender taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials. Since the associated probability of 0.000 was less than 0.05, the null hypothesis four which states that there is no significant difference between the mean achievement score of basic science students by gender taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials was rejected. This implies that there is a significant difference between the mean achievement score of basic science students by gender taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials.

TABLE 5: Analysis of Covariance (ANCOVA) of the significant difference between the mean retention scores of basic science students by gender in experimental and control group.

Source	Type III Sum of Squares	df	Mean Square	F	P-value
Corrected model	1517.238[a]	4	379.309	44.877	.000
Intercept	3001.773	1	3001.773	355.144	.000
Pretest	32.578	1	32.578	3.854	.051
Methods	1347.024	1	1347.024	159.368	.000
Gender	50.366	1	50.366	5.959	.084
Methods* Gender	70.101	1	70.101	8.294	.073
Error	1580.575	187	8.452		
Total	35702.000	192			
Corrected total	3097.812	191			

a. R Squared = .490 (Adjusted R Squared = .479)

The result in Table 5 shows that an F-ratio of 5.959 with an associated probability value of 0.084 was obtained with regards to the difference between the mean retention score of basic science students by gender taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials. Since the associated probability of 0.084 was greater than 0.05, the null hypothesis five which states that there is no significant difference between the mean retention score of basic science students by gender taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials was accepted. This implies that there is no significant difference between the mean retention score of basic science students by gender taught the concept of electrical energy using students constructed instructional materials and those taught using teachers' constructed instructional materials.

Discussion of Findings

Findings of the study in hypothesis one shows that involving students in the construction of instructional material significantly improved their academic achievement. The students in the experimental group had mean scores higher than their counterpart in the control group. It can also be due to the fact that, involving students in instructional materials construction increased their active participation in classroom activities. This is in line with Ezirim (2016), Odo (2015) Onasanya and Omosewo (2010) who observed that physics students taught using students improvised instructional materials perform better than those taught using conventional materials. This may be due to the fact that teaching students with materials constructed by them makes the lesson simple and students were able to assimilate and internalized the concept effectively.

Findings in hypothesis two shows a significant difference between the mean retention scores of students taught using students' constructed instructional materials and those taught using teachers' constructed instructional materials. This improvement in the retention performance of students could be attributed to the fact that involving students in the construction of instructional materials captures the students' attention. This finding is in line with the study Sadi (2011) whose result revealed that students who were exposed to hand-on activity enriched instruction performed and retained concepts more significantly than their counterparts who were taught using traditional instructional strategy. This could be as a result of the fact that hands-on activity enriched instruction and therefore enhances students' retention in science.

Findings in hypothesis three reveal a significant difference in the mean achievement scores of students in their ability level. The findings of this study is in line with the findings of Dike (2011) that revealed a significant relationship between the overall students' academic achievement in Integrated Science at Junior Secondary School Certificate Examination (JSCE) and Biology at Senior Secondary Certificate Examination (SSCE). The finding also agrees with the work of Effiong and Onwioduokit (2019) who posit that, ability and interest play an important role in the knowledge of a particular concept in science. When a learning task is set before the students, the aptness in responding to the set learning task is centrally control by ability and interest. The extent of the students' ability and interest in a particular course of study is indicated by active participation in the study with resulted good performance. This is done through the application of the knowledge acquired and possibly transfers to the new learning concept and situation.

Findings in hypothesis four shows a significant difference in the mean achievement scores of students by gender who took part in the construction of instructional materials prior to the actual lessons. Result shows that both male and female students received the same treatment but male students had a significant higher score than their female counterpart. This higher result may be an outcome of the fact that, male students are interested in science than female students. The findings are in line with the findings of Mboto, Udo and Utibeabasi (2011) who observe a significant difference in the mean achievement scores of student in favour of the male students. This could be as a result of negative and stereotyped perceptions among female students that professions and subjects in science are male domain. The results of this study contrast with the findings of Mangut and Ofodeli (2015) whose results revealed that gender had no effect on students' achievement. It also contradicts the findings from Odo (2015) who posit that male and female students can perform equally when exposed to the same tools of instruction.

Findings in hypothesis five show a significant difference between the mean retention of male and female students taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials. The null hypothesis was therefore rejected. This implies that there is significant difference between the mean retention score of male and female students taught the concept of electrical energy using students' constructed instructional materials and those taught using teachers' constructed instructional materials. This agree with Ezirim (2006) and Odo (2015) whose finding shows that male students performed better than their female counterparts. This could be as a result of the fact that students build better understanding and retention of the concept more effectively when they are involve in material production.

Conclusions

Based on the results obtained in the study on the effect of students' constructed instructional materials on their academic achievement and retention in Basic Science in Oron Local Government Area. It was found out that students taught electrical energy using students' constructed instructional materials performed better than students taught using teacher's constructional instructional materials. Result of the study therefore show a significant difference in the mean achievement scores of the students by the ability level in favour of experimental group. The result also revealed that male students' performance better than their female counterparts.

Recommendations

In view of the findings of this study and it educational implications, the following recommendations are made:

1. Teachers of Basic Science should always involve the students in materials construction during teaching and learning process whenever there is lack or inadequately of such instructional materials.
2. The school authority in collaboration with the Government and Science Teachers' Association should organize science fair which includes activities section in schools.
3. The government should organize in-service training for Science Teachers in order to enable them learn how to produce and use some of the science resources.
4. Seminars, workshop and conferences should be organized more frequently for Basic Science Teachers to update their knowledge on activity-based learning.

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