EFFECTS OF LEARNING STYLES ON STUDENTS' ACADEMIC ACHIEVEMENT IN BASIC SCIENCE IN RIVERS STATE, NIGERIA

WAGBARA O. SAMUEL, PhD.
Department of Integrated Science
Faculty of Natural and Applied Sciences
Ignatius Ajuru University of Education
Port Harcourt, Nigeria

Abstract

Students' high academic achievement in Basic Science depends on good techniques and effective method of teaching the subject. As a science subject, good grasp of the content by the students becomes paramount. Hence, the main purpose of this study was to investigate the effect of learning styles on student's academic achievement in Basic Science. The study was carried out in Rivers State central educational zone, Nigeria. The zone is made up of 9 local Government Areas. The multi stage sampling techniques was carried out in three stages, namely; zonal level, local government level and school level. Simple random sampling by balloting was used to obtain a sample of 94 (JSS 2) students of two schools that participates in the study. The instruments used for data collection were Basic Learning Styles Inventory (BLSI) and Basic Science Achievement Test (BSAT). The data collected were analyzed by using mean and standard deviation to answer all the research questions while Analysis of Variance (ANOVA) was used to test all the hypothesis at .05 level of significance. The study found out that learning styles had no significant effect on students' mean achievement scores in Basic Science, P > .05. The study also found that Gender had no effect on academic achievement of students in Basic Science P > .05. Hence, adequate teaching aids suitable for the different learners should be properly used to enhance better achievement in Basic Science. Also, similar instructional instruments should be used for all the students despite the gender.

Introduction

Students' good understanding of Basic Science can enhance scientific literacy of citizens in a nation. The scientific knowledge acquired can inculcate into them right attitude and skills as well as high intellectual power of understanding their environment.

Good understanding of Basic Science could develop in students formidable knowledge, that can help them to build creative skills which can help a nation to achieve technological breakthrough. It is in the view of this, that Okebukola (1996) stated that, the 21st century is characterized by advancement in science and technology which makes it imperative for every nation to strive to achieve scientific and technological breakthrough with their environment. Hence, for technological development and scientific literacy to be achieved in 21st century, effective teaching of Basic Science in Nigerian schools must be promoted.

However, evidence from literature showed that the teaching methods applied by teachers in Nigeria are mostly lecture method that does not involve much of student -student or student-teacher interactions (Olarewa, 1994 Achimugu, 2005; Adejoh, 2011 and Okoye, 201cited in Achimugu, 2014). To improve achievement in science a new Basic Science curriculum which

is student centred and which lay emphasis on learning science as a process rather than a body of knowledge or as an examination centred subject was introduced in Junior Secondary Schools. Federal Ministry of Education (2007) states that, the overall objectives of the curriculum is to enable learners to; develop interest in science and technology, acquire basic knowledge and skills in science and technology, apply their science and technology knowledge and skills to meet societal needs, take advantage of the numerous career opportunities offered by science and technology and become prepared for further studies in science and technology.

To implement those good objectives, the teaching methods adopted are guided discovery, inquiry, demonstration, discussion, field trips/excursion, project, lecture, process based; concept mapping, scaffolding, team teaching, role play and cooperative learning (NIT, 2009). Retention of concepts and skill development that leads to creativity is fostered by those methods.

Despite, those efforts made to improve achievement of students in Basic Science, the major challenge in Basic science education in Nigeria is that achievement in Basic Science taught in schools still fall below expectation. It is imperative to note that, one way of bringing about change of emphasis in teaching, from teacher dependent approach to facilitated approach is by changes of medium of instruction (Kenesly, 2000).

Learning styles may offer a good alternative medium, if individual students' learning styles are taken into consideration during lesson delivery. A learning style refers to a person's preferred way of learning (Tooslowwarn, 2009). Delha-dora and Blanchard (1979) states that learning style personally preferred way of dealing with information and experiences for learning that crosses content areas thereby putting emphasis on information processing.

Furthermore, the idea that constant learning creates constant need for learning styles, makes it necessary for learning styles to be seen as methods we apply when there is need to concentrate on new and difficult information, absorb this information and transfer it to knowledge, process the information knowledge we have stored.

Hence, learning styles are the individual differences in idieational power and handling of processed information. In lesson delivery, the consideration of learning styles could improve students' achievement in Basic Science as it deals with good grasp of students' individual differences in process of knowing understanding and decoding of processed information. This study used the learning styles which has received a greater attention in research, they are; visual learners (v), Auditory learners (A) and kinesthetic or tactile learner's (K), (Fleming, 1995; Coffield, Mosikey, Hall and Ecclestone, 2004). Visual learners have preference for seeing in pictures. Visual ideas that represent ideas using models such as graph, charts, diagrams, symbols. Auditory learners best learn by listening to discussion, tape recorder and lectures. Tactile or kinesthetic learner, learn via experience by moving, touching and doing (active exploration).

Furthermore, due to the search for effective approach to the teaching of science, researchers have made so much efforts towards distinguishing techniques and methods for more effective teaching of science subjects as poor academic achievement and poor skill acquisition has persistently been reported especially at the Junior Secondary School level (Ibe, 2013; Monder, 2013). Hence the need to determine the influence of learning styles on students' academic achievement in Basic Science become necessary.

Purpose of the Study.

The main purpose of the study was to determine the efforts of learning styles on students' academic achievement in Basic Science. Specifically, the study determines;

1. Effect of learning styles on students' academic achievement in Basic Science.
2. Effect of gender on students academic achievement in Basic Science.

Research Questions

1. What are the achievement mean scores of students of different learning styles in Basic Science?
2. What are the achievement mean scores of male and female students in Basic Science?

Hypotheses

The following hypotheses which were tested at 0.05 level of significance further guided the study.

1. There is no significant difference in the achievement mean scores of the students of different learning styles in Basic Science.
2. There is no significance differences between the achievement mean scores of male and female students in Basic Science.

Methodology

This study adopted expost-facto research design. The study was carried out in Rivers State central educational zone, Nigeria. The zone is made up of 9 local Government Areas out of the twenty-three (23) Local Government Areas in Rivers State. The multi stage sampling technique was carried out in three stages namely; zone level, local Government Area, level and school level. Simple random sampling by balloting was used to select one zone out of the three educational zones in Rivers State. A second round of simple random sampling by balloting was used to select one Local Government Area (Obio/Akpor) out of the nine local government areas in the zone. Third round of simple random sampling by balloting was carried out to select two schools out of the 20 Public Junior Secondary Schools in the local government area in the zone. 94 (JSS 2) students of the two schools participated in the study. The instruments used for data collection were Barsh's Learning Styles Inventory (BLSI) and Basic Science Achievement Test (BSAT).

The data collected were analyzed by using mean and standard deviation to answer all the research questions while Analysis of Variance (ANOVA) was used to test the hypotheses at .05 level of significance.

Results

Research Question I

What are the achievement mean scores of students of different learning styles in Basic Science?

Table I: Achievement means scores and standard deviation scores of students of different learning styles in Basic Science.

Learning styles	N	Mean	SD
Visual (VS)	40	82.00	10.08
Auditory (Aud)	48	82.60	9.45
Kinesthetic (K)	6	77.50	23.32

Table I showed that achievement, means score of students with visual learning style was 82.00 with associated standard deviation of 10.08. Those students with Auditory Learning style had achievement mean score of 82.60 with associated standard deviation of 9.45, while the students with kinesthetic learning style had achievement mean score of 77.50 with associated standard deviation of 23.32.

Hypothesis I: There is no significant difference in the mean achievement scores of the students of different learning styles in Basic Science.

Table 2: Analysis of variance (ANOVA) of difference in achievement mean scores of students of various learning styles in Basic Science.

Source	Sum of squares	Df	Mean	F	Sig.
Between Groups	138.978	2	69.489	.546	.581
Within Groups	11596.978	91	127.220		
Total	11715.957	93			

The result in Table 2 shows that an F-ratio of .546 with associated probability value of .581 was obtained. The probability value was compared with 0.05 and it was found that learning style had no significant effect on students' mean achievement scores in Basic Science because .581 was greater than .05 (F2.91 = .546, P> .05). The null hypothesis one was accepted at .05 alpha level and inference drawn that there is no significant difference in the achievement mean scores of students of different learning styles in Basic Science.

Research Question 2

What are the achievement mean scores of male and female students in Basic Science?

Table 3: Achievement mean scores and standard deviation scores of male and female students in Basic Science.

Sex	N	Mean	SD
Male	53	81.79	10.61
Female	41	82.31	12.09

Table 3 shows that, the mean achievement score of the male students was 81.79 with associated standard deviation score of 10.61. While, the mean achievement score of the female students was 82.31 with associated standard deviation of 12.09. The means score of the females was higher than that of the males with the mean difference of 0.52. The higher standard deviation of the females indicates that their scores deviated more from the mean than that of the males. That indicates that the observed higher mean of the females may not be real as it appears.

Hypothesis 2: There is no significant difference between the mean achievement scores of male and female students in Basic Science.

Table 4: Analysis of Variance (ANOVA) of difference between the mean achievement scores of male and female students in Basic Science.

Source	Sum of squares	Df	Mean	F	Sig.
Between Groups	6.362	2	6.362	.050	.824
Within Groups	11709.595	92	127.78		
Total	11715.987	93			

The result in Table 4 shows that an F-ratio of .050 with associated probability value of .824. The probability value was compared with 0.05 and it was found out to be significant because .824 was greater than .05 (F1.92 = 050, P> .05). The null hypothesis two was accepted at .05 alpha level and inference drawn that there is no significant difference between the mean achievement scores of the male and female students in Basic Science.

Discussion

Table 2 showed an F-ratio of .546 with associated P > .05. The result of testing hypothesis one (Hoi), showed that there is no significant difference in academic achievement of students of different learning styles in Basic Science. Based on the result, hypothesis one which stated that there is no significant difference in the achievement mean scores of students of different learning styles in Basic Science was accepted. The result of this study agree with the finding of Ahuama (2018) which states that there is no significant difference in the mean achievement scores among students of various learning styles. The finding of Warn (2009) also agree with the finding of this study as it states that there is no significant association between the students learning style and academic performance with or without controlling for their previous academic achievement. The result of this study has confirmed that there is no significant difference in the achievement mean scores of students of different learning styles in Basic Science.

Table 4 showed an F-ratio of .050 with associated P > .05. The result of testing hypothesis two (Ho), showed that there is no significant difference between the means achievement scores of male and female students in Basic Science. Based on the result, hypothesis two which states that there is no significant difference between the achievement mean scores of male and female students in Basic Science was accepted. The result of this study agree with the finding of Ahuama (2018) which states that there is no significant difference in the mean achievement scores of male and female students in Basic Science. Above all, the result of this study have confirmed that there is no significant difference scores of male and female students in Basic Science.

Recommendation and Conclusion

Firstly, from the findings of this study; learning styles have no significant effect on student mean achievement scores in Basic Science. The result showed that visual learning style students had equal academic achievement with Auditory learning Style Students and Kinesthetic Learners in Basic Science. Hence, the various instructional methods and teaching aids that are suitable for the different learners to learn should be adequately used for the learners of different learning styles. That could enhance high academic achievement of the students in Basic Science.

Secondly, from the result of the findings gender does not have significant effect on academic achievement of students in Basic Science. The result indicates that, there is no significant difference between the mean achievement scores of male and female students in Basic Science. This was shown as P > .05. Hence, instructional treatment should be used for the students of all learning styles irrespective of the students' gender.

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