

EFFECTS OF ACTIVITY-BASED INSTRUCTIONAL FACILITIES UTILIZATION ON THE LEARNING EXPERIENCES OF SECONDARY SCHOOL BIOLOGY STUDENTS IN EDUCATION DISTRICT TWO OF LAGOS STATE

Dr. James Timothy
School of Education

National Open University of Nigeria, Ahmadu Bello Way, Lagos

Abstract

This study focused on finding out the effects of activity based instructional facilities utilization on learning experiences of senior secondary biology students in education district 2, Lagos State. Four research questions and two null hypotheses were formulated. Ten senior secondary II biology students were randomly selected from the twenty seven public secondary schools in the district together with their teachers. Again 30 students were randomly selected from each school through balloting giving a total of 300 students out of which 292 submitted their questionnaire. (n = 292 student and 10 teachers). The two major instruments used were both students' and teachers' questionnaires with oral interview for the biology teachers. The instruments were administered by the researcher. Tables, percentages and Bar graph was used in the analysis of the research questions while t-test was used to analyze the research hypotheses. At the end of the analysis, the first null hypothesis was significant and the hypothesis rejected while the second hypothesis was retained. The findings revealed that activity based instructional facilities enhanced the academic performance of biology students and that there was no significant difference in the attitudes of both male and female towards learning biology. It was recommended that biology teachers should endeavour to employ activity oriented instructional facilities when teaching.

Introduction

The study of science is very important in any educational system and in recent years, educationist have become very concern about the deteriorating standard of science education in our secondary schools and there is tremendous loss of enthusiasm for the study of science in Nigerian institution of learning. This was corroborated in the WAEC chief examiners report 2014, where the poor performance of students in senior secondary school certificate examination in the science was lamented. One way of solving this problem is to motivate the students through the utilization of activity-base instructional facilities.

Theories of occupational development have always recognized learning experience through the use of activity based facilities as fundamental to human resources

development. According to Owoh (2009), learning experience is the interaction between the learner and the external condition in the development to which he can interact.

The utilization of instructional facilities imports usable and demonstrable skills to the learner and for productive curriculum. (Wale, 2007) Eya (2006) asserts that techniques required for effective activity-base facilities are identification, experimentation, demonstration, task instruction and project methods. According to Dahar and Faize (2011) teaching generally should help the learner acquire a blend of theory and practical skills. Content alone is not sufficient for functional learning activity base instructional methods. According to Osinem (2009) Biology is a practical oriented subject and student get interested when they are involved in the learning process and when they are able to see relationship between what is taught in the school and its application in the contemporary life outside the school.

The modern approach to the learning of science generally has shifted from rote learning of the accumulated facts to laboratory investigation (James 2013). Yusuf (2005) has emphasized that the laboratory work is one of the most significant trends in science teaching. The learning through practical work is more firmly fixed in the memory than learning through other methods (Olagunju&Abiona, 2008).

Akubuilu (2007) revealed clearly the role of practicals in science teaching. He went further that practical activities is very necessary for effective teaching of biology. Okhinla (2007) contends that practical work should be a challenge to creative thought and not just a theoretical process. Asiyal (2012) found out the effectiveness of laboratory in developing skill through hands-on activity hence laboratory facilities must be adequate utilized in the teaching of biology. This study then attempted to investigate

Research Questions

- What are the effects of activity-based instructional facilities on the learning experience of students?
- What are the effects of activity-based instructional facilities across levels of senior secondary school students?
- What are the effects of activity-based instructional facilities on different age groups of senior secondary school students?
- To what extent are the activity-based instructional facilities used in senior secondary schools in Education district II of Lagos State
- How available are the activity-based instructional facilities in the selected senior secondary schools?

Research Hypothesis

1. There is no significant relationship between activity base instructional facilities and attitudes of students towards learning biology
2. There is no significance difference in the attitude of male and female students towards activity based instructional facilities

Methodology

This research adopted a survey design. The population consisted at all the public senior secondary schools in the education district two of Lagos state totaling twenty seven. Ten schools were then randomly selected from the 27 schools using balloting system. Again, 300 senior secondary two (SSII) students and ten biology teachers were randomly drawn from the 10 schools. However only 292 students submitted their questionnaire.

The major instruments use for this research was questionnaire for both students and the biology teachers. Oral interview was conducted for the biology teachers. The questionnaire for biology teachers was made up of 25 items which was patterned towards Likert scale of: strongly agree, agree undecided, disagree and strongly disagree.

Biology students questionnaire on activity base instructional facilitating utilization (OAIU) is made up of 14 items patterned towards Likert scale of Strongly Agree (SA) Agree (A) Undecided (U) Disagree (D) and Strongly Disagree (SD).

The oral interview was conducted only on the biology teachers and it is made up of 5 open ended question. The interview was aimed at getting information about availability of activity based facilities such as laboratories, scientific equipment, reagent, botanical garden and other teaching aids.

Both the questionnaires and the oral interview questions were validated by three experienced science educators from the science education unit, National Open University of Nigeria, Victoria Island, Lagos. The comments, corrections and suggestions of the panel of validators were used to produce the final copy of both the questionnaires and the oral interview.

The questionnaire and the interview questions were subjected to reliability test using appropriate tools. Teachers questionnaire yielded a reliability coefficient of 0.73, students questionnaire yielded a coefficient of 0.79 and the oral interview questions yielded a coefficient of 0.71.

The administration of the questionnaires to the students and biology teachers was carried out by the researcher himself. Thereafter, the oral interview was conducted to the biology teachers in the selected schools. The completed questionnaire were collected instantly from the students and the biology teachers.

ATA Analysis From Research Questions.

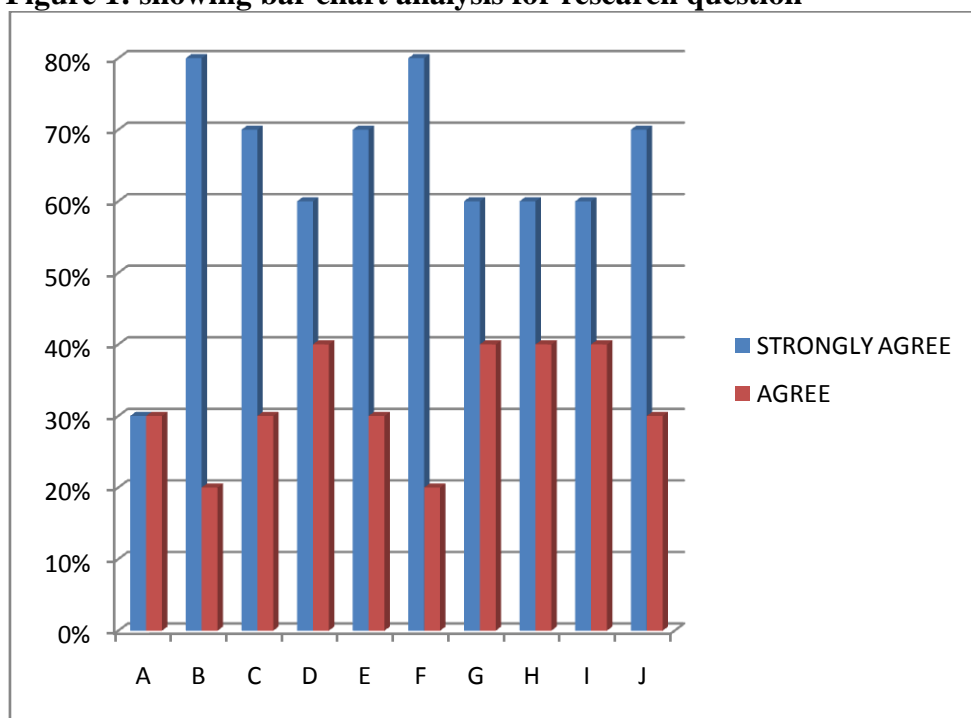
Table 1 showing analysis of question

Categories	Question	Strongly agree	Agree
A	My school have a well equipped biology laboratory	7 (70%)	3 (30%)
B	There are preserve specimen of various animals and plant in the laboratory	8 (80%)	2 (20%)
C	Food test reagent are available in my laboratory	7 (70%)	3 (30%)

D	There are several chats in my school	6 (60%)	4 (40%)
E	Different models of organs are available	7 (70%)	3 (30%)
F	There are many microscopes in my school	8 (80%)	2 (20%)
G	There is a aquarium in my school	6 (60%)	4 (40%)
H	There is biological garden in my school	6 (60%)	4 (40%)
I	There are quadrants in my school	6 (60%)	4 (40%)
J	There are hand lenses and magnifying grasses in my school	7 (70%)	3 (30%)

Table one above shows the responses on teachers perception of the activity base instructional facilities utilization in the teaching of biology. The responses were classified according to the Likert scale of strongly agree, agree, undecided, disagree and strongly disagree. Interestingly, all the teachers responded to either strongly agreed and agreed. None of the respondents responded to undecided, disagreed and strongly disagreed. From the look of the responses, the perceptions of biology teachers are more favourable in the context of the use of activity base instructional, techniques in their various schools.

Figure 1: showing bar chart analysis for research question



Hypotheses Testing

Hypothesis 1: There is no significant relationship between activity base instructional facilities and the attitudes of students towards learning biology

Table 2: t-test of attitudes of students perception towards activity base instructional facilities

Response	N	Mean	Mean diff	t	Df	Sig P	Critical t	Remark
Activity based instruction	292	17.73		22.83	291	0.00	2.093	Significant
Student attitude	292	10.80	6.92					

In order to test the first hypothesis, t-test analysis was used paired sample t-test was use to compare the means of two variables for a single group. It computes the differences between values of the two variables for each case and test whether the average differs from zero. For each pair of variables, correlation, average difference in means, t-test and confidence interval for means difference was calculated. The result as shown in the table shows that there is significant relationship between activity based instructional facilities and the attitude of students towards biology learning. $t_{cal} = 22.83 > t\text{-statistic } 2.093$ at 95 confidence interval ($t = 22.83 > 2.093$). Therefore hypothesis one is hereby rejected. This implies that activity based instructional facilities have improved the attitude of students towards learning biology.

Hypotheses two: There is no significant difference in the attitude of male and female Biology students towards activity-based instructional facilities.

Table 3: t-test of attitudes of male and female students towards activity base instructional facilities.

Sex	N	Mean	Mean diff	t	Df	Sig P	Critical t	Remark
Male	100	11.09		0.76	291	0.45	2.09	Not significant
Female	192	10.65	0.44					

Table 3 above shows that the calculated t of 0.76 is less than critical t of 2.09. This was not significant at 95 confidence level hence there is no significant difference in the attitude of male and female students towards activity base instructional facilities. Therefore the hypothesis is retained. ($t = 0.76 < 2.09$)

Analysis of the Oral Interview

There were 5 open ended questions for the oral interview meant for the biology teachers. The summary of their responses were summarized as follows:

1. There were enough instructional materials for teaching biology in the schools, some of these facilities include microscopes, charts and reagents etc
2. My school have a separate laboratory for the teaching of biology.
3. My schools have biology garden and aquarium for teaching ecological concepts.
4. I use enough activity based instructional facilities in teaching biology in my school.

Discussion

The results obtained in hypothesis one suggested that there was significant relationship between activity base instructional facilities and the attitudes of students towards learning biology. This led to the rejection of the hypothesis ($t = 22.83 > 2.093$). This implies that the use of activity based instructional facilities enable the student to understand the concepts in biology hence leading to improvement in performance. This result holds the same opinion with that of Eya (2006) Dahar and Faize (2011) and Yara&Otieno (2010) who discovered in their separate findings that utilization of instructional facilities enhance the academic performance of science student.

However, findings in this study contradict that of Asiyai (2012) who assessed school facilities in public secondary schools in Delta State, Nigeria. His findings revealed that availability and utilization of instructional facilities alone do not determine academic performance of students but the teachers methodology.

The result of the second hypothesis led to the retaining of the hypothesis that there was no significant difference in the attitudes of male and female students towards activity based instructional facilities. The findings from this hypothesis implies that both male and female biology students attitudes were statistically the same ($t = 0.76 < 2.09$). The findings was not significant at 95 confidence interval. One would not be surprise at this findings probably because Biology is being studied in open field, bush and other places where life exist (James 2010, Olaguju&Abiona 2008). Biology is a practical oriented subject and students both male and female get interested when they are involve and are able to see the relationship between what is taught in the classroom and its application in the contemporary life outside the school (Olitan, 2004). This finding is in support of Spinatin, Freudenthaler and Neubaver (2010), who found that both male and female learners are the same in terms of academic achievement and attitudes in the classroom. This assertion was supported by several others: Eisenberg &Spinrad (2004), and Eschenbeck, KohnmanLohaus (2007). However this findings contradicts that of Duckworm and Seligman (2006) who opine that self discipline gives girls the edge over boys in terms of academic performance and attitudinal change in science classrooms.

Recommendations

On the basis of the findings, the following recommendations are hereby made.

- Science teachers need to undergo further training to update their skills in lesson delivery and use modern effective teaching methods that will enable students to use hands on activity methods.
- School administrators should make relevant instructional facilities available for thorough teaching and learning of science concepts
- Laboratories should be well equipped with facilities and relevant reagents.
- Laboratory assistants and attendants should be provide for each laboratory
- Biological garden should contain an aquarium should be provide in each school.

Conclusion

This study has shown that the use of activity based instructional facilities enhance students understanding of Biology. This consequently enable them to develop positive attitudes towards biology.

Activity-base instructional facilities involves hands-on activity approaches to instruction as oppose rote learning.

References

- Akubulo, D. U. (2007). Effective utilization of ICT science instruction at the tertiary level: inhibiting factors in J. B. Babalola, G. O., Akpa, A. O. Ayeni, S. O. Adedeji Eds. *Access, equity and quality in higher education*, pp 513 – 521 Lagos NAEAP
- Asiyal, R. I. (2012). Assessing School Facilities In Public Secondary Schools In Delta State, Nigeria *African research review international multiphany journal* 6 (2) 192 – 205.
- Bulama, K. H. (2001). An evaluation of Educational facilities in technical colleges in north eastern Nigeria. An unpublished Ph.D thesis, dept. of Vocational teaching education, University of Nigeria, Nsuka.
- Dahar, M. A. Faise F. A. (2001). Effects of the availability and the use of instructional material on academic performance of students in Pujab Pakistan *middle eastern finance economic journal* issue 53, 110 – 120.
- Duckworth A., Seligman M. (2006). Self-Discipline Gives Girls TheEdge: Gender In Self-Discipline Grades And Achievement Test Scores. *Journal of Educational Psychology* 98 198 – 208.
- Eisenberg, N. Spinrad T. L. (2004). Emotion Related Regulation: Sharpening The Definition. *Child Development* 75, 334 – 339.
- Escenbeck, H. Kohlman C. Lohaus, A. (2007). Gender differences in coping Strategies children and

- adolescent. *Journal Of Individual Difference*. 28 18 – 26.
- Newhouse, C. O. (2002). The impact of ICT on learning and teaching pertin: special education service.
- Eya, P. (2006). Role of instructional materials in the improving qualitative education in Nigeria, Ebonyi State University. *Journal of education 4 (1)* 77-97.
- Federal Republic of Nigeria (2008) *National Policy on Education* (5th edition) Yaba, Lagos, NERC press.
- James T. & Pemida R. (2010). Ecological Education Through Biological Garden, 451 Annual Conference Proceedings Of STAN Pg. 157 – 161.
- Okhiria, P. (2007). ICT Tertiary Level Education: Universities and Colleges of Education Retrieve From File [HTTP://WWW.WIIEUCATOR.ORG/ict4AFRICA/COUNTRYREPORT_NIGERIA_ON18/5/2010](http://www.wiieucator.org/ict4AFRICA/COUNTRYREPORT_NIGERIA_ON18/5/2010).
- Olagunju A M & Abiona O F (2008) Production and utilization of resources in Biology Education. Acase study of south western Nigerian Secondary Schools. *International journal of African and International studies*. 7 (2) 65-73
- Osinem, E.C. (2006). Activity Base Instructional Facility Utilisation for Enhancing Learning Experience. *Nigerian Journal of Professional Teachers vol 4 (4)* 78 – 83.
- Owoh, T. M. (2009). Availability of instructional materials for teaching of applied electronics in secondary schools in Enugu. *Ebonyi Technology occasional education journal 3 (1)* 118 – 121
- Sewyerr, A. (2004). Challenges facing African universities selected issues. *African studies review*. 47 (1) 1 – 59
- Spinaton, B. Freudenthler H. H. ,Neubaver, A. C. (2010) Domain Specific School Achievement In Boys And Girls As Predicted By Intelligence, Personality And Motivation. *Personal Individual Differences*, 48 481 – 486.
- Wale T. O. (2007). Teaching aid and obstacles: *African Journal of education* 20 (1) 215 – 235.
- West African Examination Council (2014) Chief Examiners Report Sciences.
- Yara, P. O. Otieno, K. O. (2010). Teaching/learning resources and academic performance in mathematics in secondary schools in Bondo district of Kenya: *Asian Social Science (ASS)* 6 (12) 27 - 37.
- YUSUF, M. O. (2005). Integrating ICTS in Nigeria Tertiary, Education The African Symposium: An Online *Journal Of African Educational Research Network*. 5 (2) 43 – 50.