

Adequacy of Instructional Materials and Interest of Secondary School Students in the Study of Physics in Oredo Local Government Area of Edo State, Nigeria.

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Abstract: The study investigated the adequacy of instructional materials and interest of secondary school students in the study of physics in Oredo Local Government Area of Edo State. Specifically, the study investigated the adequacy of instructional materials that were available for teaching physics in secondary schools and the relationship between the level of adequacy of the instructional materials and students' interest in physics. The design of the study was a correlation research design and the population of the study comprised all SS II students offering physics in public senior secondary school students in Oredo Local Government Area of Edo state with a total number of 1,223. A total of 123 physics students were randomly selected, that is, 10% from the population and were used as the sample for the study. This was selected using a simple random sampling technique. The research instrument used for this study was a questionnaire containing the respondents' biodata, checklist of instructional materials for teaching of physics and items to measure students' interest. The data collected were analysed using the descriptive statistics of mean, standard deviation and the Pearson product Moment Correlation statistics. Findings revealed that most of the instructional materials for the teaching of physics were adequate while some few ones were not; the adequacy of instructional materials had 20% influence on the students' interest in studying physics and there was a significant relationship between the adequacy of instructional materials and students' interest in the study of physics in the public senior secondary school students in Oredo Local Government Area of Edo State. Based on the findings, it was recommended that the Ministry of Education and school administrators should provide adequate instructional materials for teaching physics in senior secondary schools in Edo State; teachers should make regular use of instructional materials when teaching physics in senior secondary schools in Edo State and teachers should improvise where instructional materials are not available to teach a particular topic in physics in senior secondary schools in Edo State.

Key words: Adequacy, instructional materials, interest.

1. BACKGROUND TO THE STUDY

Interest is one the core determinants of career choice among adolescents in Senior Secondary Schools the world over. Interest is defined as "likes and dislikes or aversions" (Denga, 1987:185). Aiken and Groth-Marnat (2006) define interest as "a feeling or preference concerning one's own activities" (P.303). On their part, Meir and Tziner (2001) define interest as the "extent of attraction to act in, to be engaged in or to receive training for any task, job or occupation" (P.136). It describes an individual's intensity of emotion or commitment to a subject or a course. Interest emphasises a person's preference to which he or she is attentive, concerned, involved, committed or occupied. Egbochuku (2008), on her part, extends the discourse by classifying interest as expressed; manifest; tested; and inventoried. It is believed that the stronger the interest expressed by an individual for a career the easier for the person to actualize his or her aspirations. Alutu (2017) argued that during formative years (childhood and adolescence) expressed interest could be unstable. Thus, as counsellors apply interest inventories, young people express their "likes and dislikes" (Harmon, 1992). Commenting on interest inventory, Thorndike and Hagen (1977) posit that items of an interest

inventory usually “take one of two contrasting forms- a categorical response of liking, indifference, or dislike, or a choice between alternative situations or activities” (P. 403).

Thus, considering the unstable nature of interest alluded to above by (Alutu, 2017) above during childhood and adolescence, it becomes imperative for the school to be a veritable avenue for guiding the youngsters to mustering their interest in order to enable them actualize their dreamed future. Since physics is an indispensable subject in the drive towards technological development, the school is expected to mobilise available human and material resources to help secondary school students to grow their interest in learning physics.

No doubt, Physics provides the basic knowledge that serves as the bedrock for vocational and technological efficiency and problem-solving in a nation. In order to transmit knowledge in physics from theory to practical experience, the teaching of the subject must be concretised. This goal of helping senior secondary school students to develop their interest in the subject compels the Physics teacher to be creative and innovative teaching the subject. Teaching principle allude to the fact that what the learner hears and sees promote easier recall on the part of the learner. This calls for the use of instructional materials by Physics teachers to stimulate the interest of the students as well as their academic performance, which has been observed to be poor over the years in the Ordinary Level Physics examinations (Owolabi, 2004). This could be due to the abstract nature of the subject as the focus is on natural objects and substances such as light, heat and measurement. This tide can only be reversed when physics teachers begin to consistently apply teaching aids, thereby getting the learners truly involved in the learning of the subject through demonstration method.

Arop, Umanah and Effiong (2015) define instructional materials as “materials which assist teachers to make their lessons explicit to learners” (P. 67). Similarly, Usman and Adewumi (2006) argue that teaching aids are a variety of equipment and materials applied in teaching and learning by teachers to stimulate self-activity on the part of the students. These materials are divided into visual and audio-visual. Visual materials include flashcards, posters, charts, textbooks, real objects, models and chalk/whiteboard. On the other hand, audio-visual materials are those we can see and as well produce sound. These include radio, television, tape recorders, videos, computers and projectors. These materials usually attract students’ to the teacher and the subject which, in turn, foster learning.

While it conceded that the crusade for the application of instructional materials has been on, and many teachers have begun to use them for teaching students in various subjects including physics, one begins to wonder how adequate these materials are in teaching physics. This is the concern of these researchers.

Some studies have been carried out in this regard. Ikioya (2008) examined the difference in the availability, adequacy, and functionality of Physical Education facilities in Edo state. The research design was a survey. The population of the study consisted of principals, teachers and members of the board of education including parents and community leaders. The sampling was done by randomly selecting a hundred and fifty (150) respondents from the above population. The instrument for data collection was a questionnaire. The data generated from the study were analyzed using mean and t-test. The findings of the study revealed that decentralization enhances the availability, adequacy, and functionality of school Physical Education facilities.

Ofojebe (2003) evaluated the availability, utilization, and maintenance of physical facilities in secondary schools in Anambra State. The research design adopted was the survey research design. The population of the study consisted of teachers and principals of secondary schools in Anambra State. The sample of the study consisted of ten percent (10%) of the secondary schools in Awka, Anambra State. The instruments for data collection were a questionnaire, interview, school records and observation schedules. The reliability of the instrument was established by using the test-retest method. Data collected were analysed by the use of cluster mean scores. The result revealed that there were no adequate physical facilities in secondary schools in Anambra State.

Agwubike&Ogbouma (2010) studied the adequacy and functionality of fitness equipment and facilities in selected fitness centres in Edo and Delta states of Nigeria. The research design utilized was the survey research design. The population included all the fitness centers in the two states –Edo and Delta states. Sampling was done by the use of 37 fitness centers, selected through the systematic

sampling technique. The research instrument used to elicit data was a structured questionnaire and a checklist. The result of the study was analyzed using frequency counts and percentage. Results obtained showed that facilities and equipment in the fitness centers studied were grossly inadequate. The result of the study also indicated that the majority of the available equipment were either non-functional or obsolete.

Ede & Olaitan (2010) conducted a study on the utilization of information and communication technology in the teaching of metal work for quality assurance of technical college graduates in the South-Western states of Nigeria. The survey research design was used in the study. The population of the study consisted of metal work teachers in South-Western states of Nigeria. A sample of one hundred and two (102) metalwork teachers was utilized in the study. The instrument for data collection was a closed-ended questionnaire. The analysis of the data gathered from the study was done using mean and standard deviations. The finding revealed that a large number of ICT tools (up to 27 ICT tools) were not utilized.

In this age of Information and Communication Technology [ICT] teachers must be able to use available local resources to produce instructional materials in senior secondary schools for teaching physics. Improvisation by teachers could boost the adequacy of instructional materials for the teaching of physics since both standard and improvised materials produce the same level of efficacy in teaching and learning (Onasanya&Omosewo).

2. STATEMENT OF THE PROBLEM

No doubt, Physics provides the basic knowledge that serves as the bedrock for vocational and technological development and problem-solving in a nation. Hence, its importance cannot be overemphasised. But it has been observed that as important as this subject, it is among the most difficult in the school curriculum and this has led to students' poor performance in the subject. Although many factors could be adduced for this poor achievement of secondary school students in physics. These may range from the way the subject is taught currently in schools making it impossible for an average student to understand its basic concepts, poor laboratory facilities, inability of the physics teacher to clearly disseminate ideas to the students and inadequate number of learning facilities in secondary schools against the rising number of students offering the subject. Just like any other science subject, most concepts in physics are abstract in nature and it is activity-oriented subject that is best taught with the students fully participating in the process. The teaching should be empirical and experiential hence the need for the utilisation of appropriate methods with relevant instructional materials that would stimulate the interests of learners in physics. It is one thing for physics instructional materials to be available and it is quite another thing for the available materials to be adequate for use especially in secondary schools. This is the drive for this study. Therefore, the statement of the problem is, could the adequate use of instructional materials stimulate the interest of senior secondary school students in learning physics?

2.1. Purpose of the Study

Generally, the purpose of this study was to examine the adequacy of instructional materials in teaching of physics in secondary schools.

Specifically, this study sought to examine the:

1. adequacy of instructional materials for teaching physics in secondary schools; and
2. Adequacy of instructional materials and interest of students in physics.

2.2. Research Questions

For the purpose of this study, the following questions were raised:

1. What is the level of adequacy of instructional materials for teaching different topics of physics?
2. What is the relationship between the level of adequacy of the instructional materials and students' interest in physics?

2.3. Hypothesis

The following null hypothesis was formulated and tested at 0.05 level of significance:

1. There is no significant relationship between adequacy of instructional materials and students' interest in the study of physics.

2.4. Significance of the Study

The findings of the study would be of benefit to students, teachers, government and researchers. The findings of the study would be of much significance to students in secondary schools, as it would bring out insights on the importance of using instructional materials for learning; instructional materials combined with the right teaching methods will have a huge impact on students and their understanding by improving students' knowledge, abilities and skills. Instructional materials make the topic relevant and easier for students to understand which will increase students' success.

This study would be of importance to teachers in secondary schools because it would help the teacher to overcome physical difficulties that could have hindered the effective presentation of a specific topic during teaching-learning process.

Again the study has much significance for both the Federal and State Government in Nigeria. This is so because it would serve as a source of information to the government on the need to provide instructional materials for teaching various subjects in order to stimulate the interest of students in learning. When instructional materials are adequately provided by school proprietors of secondary schools they would aid teachers to teach physics more effectively. This would, in turn, impact positively on the performance of secondary school students in physics. Finally, Researchers would find the report of the study important in that it will serve as a good reference document when conducting a research on the influence of instructional materials on teaching.

2.5. The Scope of the Study

This study focused on the adequacy of instructional materials in stimulating the interest of students in learning Physics in selected public secondary schools in Oredo Local Government Area of Edo state, Nigeria. Only SSII students participated in the study having been exposed to the subject for two academic sessions. Variables investigated were adequacy of available instructional materials and influence of instructional materials on the interest of learners.

3. METHODOLOGY

3.1. Research Design

The research design for this study is the correlational survey. This design studies the relationship between the independent and dependent variables. In this study, the independent variable is adequacy of instructional materials while the dependent variable is students' interest. The design was equally chosen because there was no need to manipulate any variable under study.

3.2. Population of the Study

The population for the study comprised all SS II students offering physics in public senior secondary schools in Oredo Local Government Area of Edo state. A total of 1,223 SSII students offering physics in public senior secondary schools in Oredo Local Government Area of Edo State constituted the population of the study.

3.3. Sample and Sampling Techniques

The sample used for the study was 123 senior secondary school II students who were offering physics in public schools. Therefore, the simple random sampling technique was adopted in composing the sample. The names of all recognized public senior secondary schools in the area of study were contained in pieces of papers with numbers on them and they were selected using randomization without replacement giving all the public senior secondary schools in the area of study an equal chance of been selected as a sample for this study. At the end of the exercise, the six schools selected constituted the sample out of which 123 respondents were randomly selected, that is 10% from the population of 1,223 physics students in senior secondary school II in Oredo Local Government Area of Edo State.

3.4. Instrument for Data Collection

To gather the data for this study, a carefully structured questionnaire was administered on the respondents. The instrument titled: “Adequacy of Instructional Materials and Learning Interest Questionnaire” (AIMLIQ), designed by the researchers, was used for data collection. The instrument had three sections, A, B and C. Section A elicited the biodata of the respondents. Section B contained a checklist of instructional materials for the teaching of physics while section C contained thirty-three (33) items developed to reflect the interest of the students in different topics in physics. The respondents were required to answer the items on a five- point Likert scale, ranging from 5 to 1 as follows: Very High Extent – 5; High Extent – 4; Undecided – 3; Low Extent – 2; Very Low Extent – 1. The respondents were required to tick against the rating that reflected their opinion about adequacy of instructional materials and secondary school students’ interest in the study of physics in Oredo Local Government Area of Edo State.

3.5. Validity of the Instrument

The questionnaire was developed by the researchers. This was presented to experts, one each in measurement and evaluation and educational psychology, all in the Department of Education, Benson Idahosa University, Benin City. The essence of this process was to ensure that the instrument satisfied the conditions of face and content validity. Their comments were collated and reflected in the final instrument that was used for data collection.

3.6. Reliability of the Instrument

In order to ascertain reliability of section C of the research instrument, thirty (30) copies of the research instrument were administered on 30 students who were not part of the study. Data collected were analysed using the Cronbach Alpha statistical method. The results of the analysis showed a correlation coefficient of 0.82. This implied that the instrument was good enough and could be used to elicit responses from the respondents.

4. METHOD OF DATA COLLECTION

The questionnaire was administered by the researchers on the respondents by hand with the instructions carefully read out and explained to the understanding of the students. They were given enough time to respond to the various items after which the copies of the questionnaire were retrieved on the spot for analysis to avoid misplacement or mutilation of the instrument.

4.1. Method of Data Analysis

The mean (\bar{x}), percentage (%), frequency count (F), Standard Deviation (SD) and Pearson Correlation (r) were used for the analysis of data. The mean and standard deviation were used to answer the research questions while the Pearson product Moment Correlation statistics was used to test the hypothesis at .05 alpha level of significance.

5. RESULTS

Research Question 1: What is the level of adequacy of instructional materials for teaching different topics of physics?

Table1. Mean and Standard Deviation of Level of Adequacy of Instructional Materials

S/N	Instructional Materials/Adequacy	N	Mean	SD	Remark
18	Triangular prism	123	2.64	1.553	Adequate
19	Rectangular prism	123	2.60	1.525	Adequate
20	Pendulum bob	123	2.59	1.428	Adequate
21	Hydraulics cluster	123	2.46	1.407	Inadequate
22	Pins	123	2.32	1.314	Inadequate
23	Magnets	123	2.52	1.381	Adequate
24	Resistors	123	2.50	1.396	Inadequate

From Table 1 above, it was shown that triangular prism, rectangular prism, pendulum bobs and magnets were very adequate instructional materials in teaching of physics in the schools understudied while hydraulics, pins, and resistor were inadequate in teaching physics in SSII in selected public

schools in Oredo Local Government Area in Edo State. It could be concluded that most of the instructional materials for teaching physics in the secondary schools were adequate.

Research Question 2: What is the relationship between the level of adequacy of the instructional materials and students interest in physics?

Table2. *Pearson Correlation Statistics Showing the Relationship between Level of Adequacy and Interest*

n=123

Variables	X	Std. Dev.	r	r ²	%
Adequacy	2.23	1.18			
			0.45	0.20	20%
Interest	2.88	1.26			

r² = coefficient of determination

It was observed from the data in Table 2 that the mean score of adequacy was 2.23 with a standard deviation of 1.18 while the students' interest was 2.88 with a standard deviation of 1.26. The table also showed that there was a moderate positive relationship (0.45) between adequacy and students' interest in physics. The coefficient of determination (r²) associated with the correlation coefficient of 0.45 was 0.20. The coefficient of determination (r²) indicated that, adequacy of instructional materials had 20% influence on the students' interest in studying physics. This was an indication that other factors that influenced students' interest in the study of physics not studied accounted for 80%.

Hypothesis 1: There is no significant relationship between adequacy of instructional materials and students interest in the study of physics

Table3. *Pearson Correlation on the Relationship Between Adequacy and Interest.*

Var.	Fx	SD	R	r ²	Sig.(2-tailed)	Decision
Adequacy	2.23	1.18	.45	0.20	0.04	Do not Accept Ho
Interest	2.88	1.26				

Table 3 showed that the mean score of adequacy of instructional materials was 2.23 with a standard deviation of 1.18 while the students' interest was 2.88 with a standard deviation of 1.26. The table also showed that there was a moderate positive relationship (0.45) between adequacy and students' interest in physics. The coefficient of determination (r²) associated with the correlation coefficient of 0.45 was 0.20 and this relationship was significant at 0.04. Since 0.04 is lesser than 0.05, the null hypothesis was rejected. Thus, there was a significant relationship between the adequacy of instructional materials and students' interest in the study of physics.

5.1. Summary of Findings

The purpose of this study was to investigate the relationship between adequacy of instructional materials and students' interest. The results of the study revealed the following.

Firstly, triangular prism, rectangular prism, pendulum bobs and magnets were very adequate for the teaching of physics in the schools understudied while hydraulics, pins, and resistor were inadequate in teaching physics in SSII in selected public schools in Oredo Local Government Area in Edo State. Secondly, the adequacy of instructional materials had 20% influence on the students' interest in studying physics. Thirdly, there was a significant relationship between the adequacy of instructional materials and students' interest in the study of physics.

5.2. Discussion of Findings

One of the findings of this study showed that triangular prism, rectangular prism, pendulum bobs and magnets were very adequate instructional materials for teaching physics in the schools understudied while hydraulics, pins, and resistor were inadequate in teaching physics in SSII in selected public schools in Oredo Local Government Area in Edo State. In other words, most of the instructional materials sampled were adequate. This finding is in contrast to Ofojebe (2003) who evaluated the availability, utilization, and maintenance of physical facilities in secondary schools in Anambra State and found that that there were no adequate physical facilities in secondary schools in Anambra State.

In the same vein, the finding disagreed with that of Agwubike&Ogbouma (2010) who studied the adequacy and functionality of fitness equipment and facilities in selected fitness centres in Edo and Delta states of Nigeria and found that majority of the equipment were non-functional or obsolete.

Similarly, another finding in this study showed that there was a significant relationship between the adequacy of instructional materials and students' interest in the study of physics. This finding agreed with the finding of Abdullahi (2004), who carried out a research titled "teaching facilities and students' performance in chemistry" and found that students in schools with adequate teaching facilities performed better than those in schools with less or without teaching/laboratory facilities.

5.3. Educational Implications

Findings from the present study had some implications for the educational policy makers. These include:

1. There is need for educational policy that will ensure the provision of adequate instructional materials for the teaching of physics in secondary schools.
2. The need to train physics teachers on improvisation of physics instructional materials has become an imperative. Deploying such aids for the teaching of physics will obviously stimulate the interest of students in physics which is a cardinal subject in the development of technology.

6. CONCLUSION

From the findings of the study, it was concluded that students' interest and their academic performance in physics would improve if instructional materials were available and adequate in senior secondary schools in Edo State. Therefore, from the findings, it was advised that teachers should use instructional materials in teaching physics for better understanding of the subject.

6.1. Recommendations

Based on the findings from the study, the researchers recommended the following;

1. The Ministry of Education and school administrators should provide adequate instructional materials for teaching physics in senior secondary schools in Edo State.
2. Teachers should make regular use of instructional materials when teaching physics in senior secondary schools in Edo State.
3. Teachers should improvise where instructional materials were not available to teach a particular topic in physics in senior secondary schools in Edo State.
4. School principals and school administrators should endeavour to create periods on the time table for physics practicals to enable the students utilize the instructional materials available in these schools to arouse their interest in physics.
5. Teacher education programme should integrate material development to enable teachers learn how to create and design various instructional materials and equipment to enhance the teaching-learning process.

6.2. Contribution to Knowledge

1. This research findings had shown that without mobilization and utilization of instructional materials, students and teachers may not be motivated enough for the teaching and learning of physics in particular and other science subjects, generally, in the secondary school level. Thus, this research had contributed to the knowledge by exposing to proprietors and stake holders to invest in instructional materials and facilities for academic success of their students.
2. The research findings could also be quoted as they were findings from the field work. In other words, reference could be made to the findings. The study had contributed to knowledge as it justified the authority of Abraham Maslow's hierarchy of needs as regards the motivation and its influence on students' academic performance.

REFERENCES

- [1] Abdullahi, T. (2004). Teaching facilities and students' performance in chemistry: A case study of secondary school students in Zaria. An Unpublished M.Ed. Thesis, Ahmadu Bello University, Zaria.

- [2] Agwubike, E.O. &Ogbouma, S., (2010). Adequacy and functionality of fitness equipment and facilities in selected fitness centres in Edo and Delta states of Nigeria. *Ozean Journal of Applied Science*, 3(3), 5-6.
- [3] Aiken, L. R. &Groth-Marnat, G. (2006). Psychological testing and assessment. New York. Pearson/Allyn and Bacon.
- [4] Alutu, A. N. G. (2017). Theory and practice of guidance and counselling. Benin City: Mindex Publishing Company Limited.
- [5] Arop, B. A., Umanah, F.E. &Effiong, O.E. (2015). Effect of instructional materials on the teaching and learning of basic science in junior secondary schools in Cross River State, Nigeria. *Global Journal of Educational Research*, 14, 67- 73.
- [6] Ede, E.O. &Olaitan, O.O. (2010). The utilization of information and communication technology (ICT) in quality assurance of technical college graduates in South-Western states of Nigeria. *Nigerian Vocational Journal*, 14, (2), 32-35.
- [7] Egbochuku, E. O. (2008). Guidance and counselling: A comprehensive text. Benin City: UNIBEN Press.
- [8] Harmon, L.W. (1992). Interest measurement. In M.C. Alkin, M. Linden, J. Noel & K. Ray (Eds.), *Encyclopaedia of educational research* (Vol. 2, PP. 638- 642). New York: Macmillan.
- [9] Ikioya, P.O. (2008). Centralization and decentralization of schools Physical facilities management in Nigeria. *Journal of Education Administration*, 46 (630- 649).
- [10] Meir, E.I. &Tziner, A. (2001). Cross-cultural assessment of interests. In F.T.L. Leong & A. Barak (Eds.), *Contemporary models in vocational psychology: A volume in honour of Samuel H. Osipow* (PP.133-166). Mahwah,NJ: Lawrence Erlbaum Associates.
- [11] Ofojebe, A.U. (2003). *An evaluation of the availability, utilization and maintenance of physical facilities in secondary schools in Anambra State*. Unpublished M.ED, Thesis Department of Educational Foundations, University of Nigeria, Nsukka.
- [12] Onasanya, S.A. &Omosewo, E.O. (2011). Effect of improvised and standard instructional materials on secondary school students' academic performance in physics in Ilorin, Nigeria. *Singapore Journal of Scientific Research*,1, 68-76.
- [13] Owolabi, T.(2004). A diagnosis of students' difficulties in physics. *Educational Perspectives*, 7, 15-20.
- [14] Thorndike, R. L. & Hagen, E.P. (1977). *Measurement and evaluation in psychology and education*. New York: John Wiley and Sons.
- [15] Usman, K.O. &Adewumi, A.O. (2006). Factors responsible for inability of teachers to improvise instructional materials for the teaching of mathematics. *JSTAN*, 41, 1&2, 51-56.

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