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The role of teaching aids in stimulating the interest of teaching and learning of basic science students in some selected secondary schools' in Rivers South Senatorial district, Rivers state

Nwala Longinus
Department of Science Education, Faculty of Education, Ignatius Ajuru University of Education, Port Harcourt, Nigeria

Abstract
The study examined the role of teaching aids in stimulating the interest of teaching and learning of basic science students in some selected secondary schools' in Rivers south senatorial district. The study used three objectives alongside with questions to guide the work. The study adopted dual-coding theory of pavio (1990) and Gagne, Wagner, Gola and Keller's instructional material theory (2005) to anchor the study. Questionnaire was the instrument used to collect data for the study dovetailed within survey research design. The study used multi-stage cluster and simple random sampling techniques to gain access to the size of 400 using Taro Yamane's formula as a guide. The research questions used standard deviation while the null hypotheses were tested at 0.05 level of significance. Using independent t-test and four-point likert scale computation of 2.5 acceptance bench mark. The findings revealed that, teaching aids influence the performance of students in the classroom in teaching and learning of basic science in secondary schools in Rivers south senatorial district. It also indicated that, various teaching aids can influence and be used to motivate interest in Basic science in secondary schools. The study however recommended that, principal and form teachers should give priority attention to more usage of teaching aids to help the development of students and put into productive use of their cognitive abilities in public secondary schools in the teaching and learning of Basic science in Rivers south senatorial district, Rivers State.

Keywords: Role of teaching aids, stimulating, interest, Rivers South Senatorial district

Introduction

The role of teaching aids in Basic Science be it theoretical or practical, in national development is a topical issue of our contemporary times. All developing nations must take it seriously and strategize towards its usage. Since it serves as a catalyst and propeller of enormous growth, stimulating the interest of the basic science students in schools. Nwala & Balafama (2024).

Teaching Aids have been observed as a powerful instrument to bring about effective teaching and learning. The importance of quality and adequate instructional materials in teaching and learning can occur through their effective utilization during classroom teaching. Instructional materials here include all the tools that the teachers can use to make the learning more interesting and memorable.

According to Farombi, (2021), Teaching Aids include books, audio-visual, software and hardware of educational technology. He further opines that the availability, adequacy and relevance of instructional materials in classrooms can influence quality teaching, which can have positive effect on students' learning and academic performance. With the proper use of these teaching aids, teaching can be made more effective and students learning more meaningfully.

However, mere use of these aids does not guarantee effective teaching. It is their careful selection and skillful handling by the teachers that makes them useful to speed up learning.

Writing on the role of instructional materials in teaching and learning, Balogun (2019) [5] commented that science education programmes cannot be taught effectively without the existence of equipment for teaching. This is because instructional materials help those who learn to develop problem-solving skills and scientific attitudes. Elaborating further on the same point, Ajayi and Ogunyemi (2021) emphasize that when instructional materials are provided to meet relative needs of teaching process, students will have access to the reference materials mentioned by the teacher, and also each student will be able to learn at his or her own pace. The overall result is that students will perform much better.

Teaching aids are considered important in teaching and learning in all levels of education because textbooks and other resource materials are basic tools. Absence or inadequacy makes teachers handle subjects in an abstract manner, portraying it as dry and non-exciting (Eshiwani, 2018). For example, textbooks, charts, maps, audio-visual and electronic instructional materials such as radio, tape recorder, television and video tape recorder contribute much in making learning more interesting (Atkinson, 2020). The importance of instructional materials is also evident in the performance of students.

According to Adeogun, schools, whose teachers use more teaching aids, perform better than schools, whose teachers do not use instructional materials. This corroborated the study by Babayomi (2022) that private schools performed better than public schools because students and teachers are provided with sufficient and quality teaching and learning resources. From this importance, schools at all levels of education have been advised to have quality and adequate instructional facilities and teaching aids to raise academic performance of their students.

This study is not meant to provide all the necessary ways in which teaching aids can be used to stimulate interest in teaching and learning of integrated science in schools. Hence, the role of teaching aids in arousing interest in teaching and learning of Basic science needs to be investigated, so as to enhance integrated science learning in schools and reduce students being scared away from Basic science and other core science subjects in the long run. In the course of this study, possible measures would be suggested to correct and improve on the use of teachings aids to stimulate interest.

Statement of the Problem

Most studies that look into the state of the use of teaching aids in schools, rarely do scholars attach poor performance with lack of, or inadequacy of these materials. As the studies above indicate teachings aids are important in teaching and learning and are inadequate in many schools (Kerr, 2016) [20].

Although studies in Nigeria have lamented on poor performance, they did not link this situation with inadequate quality instructional resources. These studies are clear that there is a strong link between adequate and quality instructional materials and quality teaching and learning process (Blair, 2020) [7] but have not specifically shown the link with the role, of teaching aids in stimulating interest in teaching and learning of Basic science in secondary schools in rivers south senatorial district, Rivers State. Hence, this study is set to fill the existing gap.

Objectives of the study

The main objective this study is to examine the extent to which teaching aids stimulate interest in teaching and learning of Basic science in some selected secondary schools in Rivers south senatorial district, Rivers state. Specifically, the study intends to;

1. Identify the importance of teaching aids in the classroom in teaching and learning of Basic science in secondary schools in Rivers south senatorial district.
2. Investigate the various teaching aids that can be used to motivate and facilitate interest in Basic science in teaching and learning of Basic science in secondary schools in Rivers south senatorial district.
3. To explore the views of teachers and students on the extent to which teaching aids influence students' performance in teaching and learning of Basic science in secondary schools in Rivers south senatorial district.

Significance of the study

This study intended to find the role of teaching aids stimulate interest in teaching and learning of Basic science in secondary schools in in rivers south senatorial district, Rivers State. The knowledge obtained would help the Government most especially local government and educators to reflect and make evaluation on the requirements of other instructional materials apart from class-rooms alone. Since the beginning of community secondary schools, the government and local communities have been putting more emphasis on the construction of new class-rooms, and recently, construction of laboratories. However, provision of quality secondary school education requires more than just class-rooms and laboratory buildings. The evaluation of instructional materials amid teaching aids, with other reform movements, allows educators and planners to plan for appropriate environment for teaching and learning so as to provide quality secondary school education.

The study would also influence education planners to consider appearances of physical structures such as classrooms and availability of other teaching and learning materials as some of the important factors that can influence parents to send their children to particular schools, which have attractive physical appearance and variety of other facilities. Attractive environment and the availability of other learning resources can influence students to stay in schools and stimulate learning. This study would be helpful for fulfillments of the requirement of Masters of Education degree in Administration, Planning and Policy studies.

Also the knowledge acquired from this study would be very important to other researchers who have interest in demographic dynamics of school age going children in relation to planning of school facilities. If the study concludes that students in community secondary schools perform poorly due to the lack of sufficient instructional materials, this knowledge will enable education planners to re-think the range of services the government and local communities can provide to school-aged children, and the wider community, and to find creative ways of improving school facilities that would otherwise be ineffectively utilized due to funding pressures.

Scope of the study

This study dealt with conditions of community secondary schools in relation to the use of teaching aids. The focus of the study was on stimulating interest in teaching and learning of Basic science via the use of teaching aids. The study focused on selected public secondary schools around Rivers south senatorial district.

Research questions

The study was guided by the following research questions:

1. What are the importance of teaching aids in the classroom in teaching and learning of Basic science in some selected secondary schools in in Rivers south senatorial district?
2. What are the various teaching aids that can be used to motivate and enhance interest of students in teaching and learning of Basic science in secondary schools in Rivers south senatorial district?
3. What are the views of teachers and students on the extent to which instructional materials influence students' performance in teaching and learning of Basic science in secondary schools in Rivers south senatorial district?

Research hypotheses

The research will be guided by the following hypotheses

$H0_1$: There is no significant relationship between the importance of teaching aids in the classroom teaching and learning of Basic science in secondary schools in Rivers south senatorial district.

$H0_2$: There is no significant relationship on the various teaching aids that can be used to motivate and enhance interest of students in teaching and learning of Basic science in secondary schools in Rivers south senatorial district.

$H0_3$: There is no significant relationship to the extent instructional materials influence students' academic performance in teaching and learning of Basic science in secondary schools in Rivers south senatorial district.

Research design

This study by its nature necessitated descriptive survey. Survey according to Bronia (2020) involves the collection of information from a sample of individuals through their responses to questions. Its justification lies on the fact that it is an efficient method of systematically collecting data from or broad spectrum of individuals in educational settings. While Nwosu (2016) sees it as a method that focuses in a representative sample drawn from the entire population.

Population of the study
Six thousand students (6,000) constituted the population of the nine junior secondary schools in Rivers south senatorial district, Rivers State. The statistics was obtained from Universal Basic Education Board (UBEB) 2024.

Sample and sampling techniques
The sample and sampling technique has a sample size of 400 was used for the study drawn from a population of six thousand (6,000) students of the nine schools using Taro Yamanes formula as a guide.

$$n = \frac{N}{1+n\,(e)2}$$

Where n = sample size
1 = constant
N= population
e- = degree of freedom $(0.05)^2$
The computation in the light of the above is shown below:

$$\frac{6000}{6001 \times 0.025}$$
$$= 399.8$$
$$= 400$$

The sample size for the study is 400.

Instrument for data collection
Questionnaire formed the instrument of the study. In other words, the questionnaire was used to elicit responses on the teaching materials and student's cognitive ability in secondary schools in rivers south senatorial district. A section was used predominantly to elicit responses from respondent personal background while section B was used to obtain responses to the questions. The instrument had eighteen items with both open ended and closed ended questions with the predominant design dovetailing within the framework of four point likert scale computation. It is entitled '' TEAMATSCASS QUESTIONNAIRE''.

Reliability of the instrument
The instrument was pretested using a pilot sample of 10 (Ten) respondents who are not part of the research sample. They were given the instrument to indicate their opinions. The same approach was repeated after one week and the two results were correlated. A coefficient of 0.83 was obtained and this indicates that it had a higher reliability and it could be used on the actual research sample. Reliability is the level of consistency of the test results that were obtained through the instrument.

Method of data collection
The data for this research will be collected via the administered questionnaires. This will be done by hand so as to avert questionnaire mortality. The respondents would be instructed, accordingly, on how to indicate their opinions on the questionnaire and they would be given the assurance that their personal information would give anonymity. The services of two research assistants would be sought in the distribution and collection of the questionnaires. The retrieved instrument will be counted and used for further statistics analysis.

Method of data analysis
The research questions were answered using the standard deviation while the null hypothesis was tested using independent t-test and the simple percentage at 0.05 level of significance and computed score of 2.5 was used as the acceptance benchmark for computation and analysis.

Data presentation and analysis
The data obtained from respondents are presented, analyzed and interpreted in this chapter. Specifically, the data collected were analyzed with the aid of multi-stage cluster and sample random sampling techniques while the independent t-test and four point likert scales was used to test the earlier stated hypotheses at the appropriate level of significance. The data analysis is facilitated by survey research design. Thus, this chapter is approached as follows:

Table 1: A Test Analysis of students

Boys 240 = 160 Girls = 400						
	N	**$\overline{X}$**	**Std**	**DF**	**T.cal**	**T.cri**
Student						
Boys	160	2.65	0.70	398	1.134	1.960
Girls	240	2.64	0.64			
Total	400					

Testing of Hypotheses
The study was guided by the following null hypotheses.
1. There is no significant influence in stimulating the interest of teaching aids in the classroom in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district, Rivers State.
2. There is no significant influence of the various teaching aids that can be used to motivate and enhance interest of students in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district, Rivers State.
3. There is no significant influence on the views of teachers and students on the extent to which instructional materials affect students' academic performance in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district, Rivers State.

Summary of findings
The following were the findings of the study;
1. The grand mean showed that they agree that importance of teaching aids in the classroom in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district.
2. It also showed that, the calculated E-value (7,457) is greater than the critical value (1.960) at 0.05 significance level and 398 degree of freedom. The null hypothesis is confirmed or rejected while the alternative hypothesis is retained, the result showed that their insignificant influence of importance of teaching aids in the classroom in teaching and learning of basic science in secondary schools in Rivers South Senatorial district.
3. Since the calculated t-value (1.167) is less than the critical t-value (1.960) at 0.05 level of significance at 398 degree of freedom, the null hypothesis is confirmed or retained while the alternative hypothesis is rejected. This means that there is no significant influence of importance of teaching aids in the classroom in teaching and learning of integrated science in secondary schools in Rivers South Senatorial district

4. The grand mean showed that the use of various teaching aids instructional materials have influence on the cognitive ability of students in Rivers South Senatorial district. But they also said that they are engage in hard work that will make them depressed and unable to participate actively in their classes. It also indicated that since the calculated t-value (1.134) is less than the critical t-value (1.960) at 0.05 level of significance and 398 degree of freedom. The null hypothesis is confirmed or retained while the alternative hypothesis is rejected. The result is that there is no significant influence on the views of teachers and students on the extent to which instructional materials affect students' academic performance in teaching and learning of Science subject in secondary schools in Rivers South Senatorial district.

Research question 1: Mean and standard deviation on the importance of teaching aids in the classroom in teaching and learning of Basic science students in rivers south senatorial district.

Boys=160 Girls=240 Criterion mean 2.50						
item	**X**	**SD**	**Remark**	$\overline{X}$	**SD**	**Remark**
1	2.06	0.74	D	1.75	0.81	D
2	2.56	1.00	A	2.81	0.90	A
3	2.75	0.96	A	2.74	1.09	A
4	2.75	1.07	A	2.87	1.02	A
G/m	2.52	0.94	A	2.54	0.95	

Result in Table 1 indicates the extent to which student response to each item. The grand mean shows that they agree that there is much importance of teaching aids in the classroom in teaching and learning of Science subject in secondary schools in Rivers South Senatorial district. But disagree with item (1) that all instructional materials are not at their disposal.

Table 2: Independence sample T-test analysis of the significant influence of the importance of teaching aids in the classroom in teaching and learning of Basic science students in rivers south senatorial district

Students	N	Mean	Std	DF	T.cal	T.cri
Boys	160	2.52	0.94	398	7.457	1.960
Girls	240	2.54	0.95			

Result in table 2: shows that the calculated t-value (7.457) is greater than the critical t-value (1.960) at 0.05 significant level and 398 degrees of freedom. Since the calculated t-value (1.960) at 0.05 level of significance and 398degrees of freedom. The null hypothesis is confirmed or rejected while the alternative hypothesis is retained. The result is that there is significant influence of the importance of teaching aids in the classroom in teaching and learning of science in secondary schools in Rivers South Senatorial district.

RQ2: Mean and standard deviation on the various teaching aids that can be used to motivate and enhance interest of students in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district?

Table 3: Indicates the extent to which male and female student response to each item. The grand mean of students shows that they agree that t various teaching aids that can be used to motivate and enhance interest of students in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district

Male=160 Female=240							
Item	$\overline{X}$	**SD**	**Remark**	$\overline{X}$	**SD**	**Remark**	**Criterion mean**
5	3.24	0.71	A	2.63	0.94		
6	3.47	0.50	A	2.82	1.01		
7	2.06	0.48	D	1.82	0.57		
8	320	0.67	A	2.77	0.97		
G/m	2.99	0.59	A	2.51	0.87		

Table 4: Independence sample T-test analysis of the significant influence of the various teaching aids that can be used to motivate and enhance interest of students in teaching and learning of basic science in secondary schools in Rivers South Senatorial district

Gender	N	Mean	Std	DF	T.cal	T.cri
Male	160	2.99	0.59	398	1.167	1.960
Female	240	2.51	0.87			
Total	400					

Result in Table 4 reveals that the calculated t-value (1.167) is less than the critical t-value (1960) at 0.05 significant level and 398 degrees of freedom.

Since the calculated t-value (1.167) is less than the critical t-value (1.960) at 0.05 level of significance and 398 degrees of the null hypothesis is confirmed or retained while the alternative hypothesis is rejected. The result is that is no significant influence of the various teaching aids that can be used to motivate and enhance interest of students in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district.

RQ3 Mean and standard deviation on the views of teachers and students on the extent to which instructional materials affect students' academic performance in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district.

Item	X	SD	Remark	X	SD	Remark	Criterion Mean
9	2.31	0.60	D	2.29	0.67	D	
10	2.52	0.67	A	2.61	0.72	A	
11	2.87	0.76	A	2.67	0.85	A	
12	2.91	0.79	A	2.94	0.74	A	
G/m	2.65	0.70	A	2.62	0.74	A	

Result in table 5 reveals the extent to which student's response to each item. The grand mean shows that they agree that the views of teachers and students on the extent to which instructional materials affect students' academic performance in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district. That they did not engage in any hard work that will make them depressed and unable to participate actively in their classes.

Table 6: Independence sample T-test analysis of the significant influence of views of teachers and students on the extent to which instructional materials affect students' academic performance in teaching and learning of Basic Science in secondary schools in Rivers South Senatorial district

Boys =160 Girls= 240						
Student	**N**	**X**	**Std**	**DF**	**T.cal**	**T.cri**
Boys	160	2.65	0.70	398	1.134	1.960
Girls	240	2.62	0.74			
Total	400					

Result in table 6 reveals that the calculated t-value (1.134) is less than the critical t-value (1.960) at 0.05 significant level

and 398 degrees of freedom. Since the calculated t-value (1.134) is less than the critical t-value (1.960) at 0.05 level of significance and 398 degrees of freedom. The null hypothesis is confirmed or retained while the alternative hypothesis is rejected. The result there is no significant influence of the views of teachers and students on the extent to which instructional materials affect students' academic performance in teaching and learning of science in secondary schools in Rivers South Senatorial district? This finding was in line with the view of Segatti, Nu-Paul and Keyes (2003) who asserts that students innovate with institutional materials and other innovations are signs that students are learning to use their thinking skills to solve problems which will enhance their cognitive ability. The finding also agrees with the views of instructional materials that will used to develop the cognitive skills of students.

The findings of the study show that there is no significant influence of instructional materials and students' academic performance in teaching and learning of Basic science in secondary schools in Rivers South Senatorial district. The finding supports the views of Chiaka (2018), who points out visual instructional material help the teacher to clarify establish, correlate and coordinate accurate concepts, interpretations appreciations, and enabling him to make learning more concrete, effective, interesting, inspirational, meaningful and vivid, which makes for better understanding and easy retention by the students. The finding was also in agreement with the view of Ramsey (2016) who asserts that clear pictures multiply the audience level of understanding of the material presented and they are used to reinforce the lesson, clarify points and create excitement.

Summary

The study examined teaching materials and students' ability in Secondary School in Rivers South Senatorial district, Rivers State. The study employed three research questions to guide the work. The study adopted dual-coding theory of Pavio (1990) and Gagne Wagner, Gola and Keller's instructional material theory (2005) to anchor the work. Questionnaire was the instrument used to gather relevant data from the nine selected Secondary Schools in Rivers South Senatorial district, Rivers State. Also, the multi-stage cluster sampling and simple random sampling techniques were deplored for the study. Furthermore, the study indicated that a total of 6,000 constituted the population while 400 was drawn from the population as the sample size using Taro Yamane's formula as a guide. The study answered the research question using standard deviation while the null hypotheses were tested using independent t-test and four point Likert scale computation of 2.5.

Conclusion

The study found out that, teaching aids in the classroom is very important in teaching and learning of science in secondary schools in Rivers South Senatorial district. It also indicated that, various teaching aids can be used to motivate, enhance and stimulate the interest of students in teaching and learning of science thus promoting their academic performance in teaching and learning of science subjects in secondary schools Rivers South Senatorial district.

Recommendations

The study however recommends the following:

1. Principals from time to time should evaluate the effectiveness of the instructional materials used by teachers in Secondary Schools in Rivers South Senatorial district to determine their strengths and weaknesses and recommend the most suitable one in the school.
2. State Government and Senior Secondary School board should motivate teachers always so as to bring out the best in them especially in the classroom settings.
3. State Government and Senior Secondary Schools board should provide enough teaching materials and equipment to facilitate teaching and learning in Secondary School in Rivers South Senatorial district.
4. Regular in house training, workshops and seminars should be organized by state ministry of education reacquaint teachers in its central e-learning technology.

Suggestions for further studies

There should be further studies on teaching aids in stimulating the interest in teaching and learning of Basic Science in Secondary School Students in Rivers South Senatorial district, Rivers State. This will help to boost learning in education and also provide valid and indebts information to ministry of education, policy workers and schools in the future.

Contribution to knowledge

1. School heads should engage and involve classroom teachers to plan and design appropriate teaching materials on specific subject and topic and apply the right teaching methods before presenting the lesson to the students. Teachers should be current with the e-learning technologies so as to deliver lessons at the comfort of their learners.

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