GASPRO INTERNATIONAL JOURNAL OF EMINENT SCHOLARS, VOL.13 NO 1
JANUARY 2026, GERMANY. ISSN: 2630-7200 (Hardcopy), 2659-1057 (Online)

EFFECT OF REALIA AND CHART ON STUDENTS' ACADEMIC PERFORMANCE IN BASIC SCIENCE AND TECHNOLOGY IN SECONDARY SCHOOLS IN AKWA IBOM STATE

By

ARCHIBONG, A. U., Ph.D
Department of Integrated Science,
College of Education, Afaha Nsit,
(Affiliated to the University of Uyo, Nigeria)
P.M.B. 1019 Etinan, Akwa Ibom State, Nigeria.

ABSTRACT

This paper examined the effect of realia and chart on students' academic performance in Basic Science and Technology in secondary schools in Akwa Ibom State. The study employed a quasi-experimental design. The population of the study consisted of all the students in Junior Secondary School Two (JSS2) in the public secondary schools in the area. A total of 100 students were randomly sampled from five out of eight public secondary schools in the study area. The instrument for data collection was Basic Science and Technology Performance Test (BSTPT). The two intact classes were randomly assigned to experimental and control groups using intact independent t-test statistical method. The results obtained revealed that Basic Science and Technology students taught using realia performed significantly better than those taught using charts. Recommendations were made that among others, teachers should be encouraged to use realia and chart. The Ministry of Education should intensify efforts to make facilities available for teachers. More conferences and seminars should be organized to widen the scope of utilization of realia in teaching Basic Science and Technology.

KEYWORDS: Realia, Chart, Students' Academic Performance, Basic Science and Technology and Secondary Schools in Akwa Ibom State.

INTRODUCTION

Realia is one of the visual authentic materials which can be touched and seen. Realia are real objects, which are among educational input that plays a vital role in teaching and learning processes. Abah (2016) viewed realia as tools used to supplement the written or spoken transmission of knowledge, to develop attitude and ideas and to emphasize or clarify the instruction. Okoye & Olay (2013) opined that realia are one of the tools that can be used by the teacher to provide help and encouragement to learners and learning activities. . Sambo & Sunday (2024) emphasized that the availability, relevance and adequacy of these facilities contribute to students' performance while unattractive school buildings, crowded classrooms, no availability of playground, flower beds and surroundings that have no aesthetic beauty can contribute to poor achievement. Such materials can bring students and materials in systematic cooperation to effectively solve educational problems.

Realia is a term for real things or concrete objects that are used in the classroom to build background knowledge. Researchers further explain that the selection of realia is related to the basic content of a course or lesson and greatly impacts the understanding of such a lesson by the student. It makes the lesson attractive to them, thereby arresting their attention and thus motivating them to learn (Ogbu, 2020).

Apart from realia, another important instructional resource is the chart. The main advantage of chart is that it provides the opportunity for the visualizing of concepts that would be difficult to understand if presented orally. Charts are useful in presenting information such as facts, principles, time and sequence, classification and organization (Bello, 2012). Chart is a form of graphical material made up of one or more types of graphics, pictures, drawings, diagrams and verbal materials prepared to give a clear summary of a vital process, concept or set of relationships. They are used for clarification and reinforcement of certain points in specific lessons. Charts are widely used in developing countries where electricity is low; unlike computer projection, charts do not require power supply. Doll (2015) observed that charts, when used in appropriate context, are highly effective in displaying information to a small group.

STATEMENT OF THE PROBLEM

The failure rate in the sciences including Basic Science and Technology as a whole in Junior Secondary Certificate Examination is worrisome. The act of teaching involves passing of knowledge, ideas, attitudes and skills from the teachers to the learners. Every year, the results of public examinations are released; it can be observed clearly that there are topics in science that pose serious problems of comprehension to students because they are not well-taught.

The problem is that the usage of appropriate and proper teaching strategies, instructional materials and lack of exposure to realia, chart, and personal preferences of the teachers would have eliminated the abstractness of science concepts (Adeyemi, 2010). Basic Science and Technology is one of the core subjects in the Junior Secondary School curriculum, and it is expected for students to pass this subject. In many cases, the performance of students in science generally are below expectation and this has called for serious concern among educational stakeholders.

The disadvantages of instructional materials and resources in our school for Basic Science and Technology is enormous. It is very difficult to find some of the original materials and equipment for the teaching of Basic Science and Technology in schools adequately. Instructional materials make learning meaningful and help to improve student academic performance. So the problem of this study is to answer the question: What are the effects of realia and charts on students' academic performance in Basic Science and Technology in Etinan Local Government Area?

LITERATURE REVIEW

Effect of Realia and Academic Performance of Students

Realia is one of the real objects that are among educational inputs that play a vital role in teaching and learning processes. Ricardo (2018) viewed realia as tools used to supplement written or spoken transmission of knowledge. Olay (2018) opined that realia are one of the tools that can be used by a teacher to provide help and encouragement to learners during learning activities. According to Nneji, Oshodi, Akomolede, Olayemi, Uwaila, Tochi, Iweuno, Stanley, Badmus, Samson & Adenuga (2024) Science educators and teachers agree that practical work is indispensable to understanding.

Suleiman (2016) determined after carrying out a research that the effect of instructional material using realia on students' academic performance in geography in selected secondary schools located in Hong Local Government Area of Adamawa State. Suleiman used quasi-

experimental design and had a sample size of 83 students. Furthermore, the instrument for data collection was geography achievement test (GAT) and after it was realized that students taught with realia performed significantly better than lecture group.

EFFECT OF CHARTS AND ACADEMIC PERFORMANCE OF STUDENTS

This is defined as the graphical materials made up of one or more graphics—pictures, drawings, diagrams and verbal materials—prepared to give a clear summary of a vital process, concept or set of relationships. The major advantage of chart is that they allow for visualization of some ideas or concepts that would be more difficult to understand if presented orally or written in words.

Owoeye (2015) conducted a study to determine the effect of learning materials using realia and charts on students' academic performance in biology in some local government areas of Kano State. The sample size for the study was 250 students. Data were collected using biology achievement test (BAT). After analysis, the results revealed that visual learning materials such as realia and charts played a significant role in enhancing better understanding and higher performance of students in Biology.

Mohammed (2017) conducted a study on the effect of chart on students' instructional material quality and students' performance in biology in selected secondary schools in Zaria. His sample size was 80 students from different schools. The instrument for data collection was biology achievement test (BAT). After statistical analysis at 0.05 level of significance, the findings indicated better achievement of the students taught using realia and visual instructional materials (experimental group) than those taught without visual instructional materials (control group).

Gender Issues in Science

The description of gender as a cultural construct and social position which members of the society attach to being male or female. Gender is also the dimension of social organization which shapes how a person relates to others and how people behave or act and think about themselves. Gender includes thinking, recognition of men and women distinctly in terms of roles assigned.

Researchers noted that gender is a form of cultural determinant that varies from one place or culture to another. Gender is universal unlike sex which is biologically determined and universal. Human feelings, thought and actions reflect the social definition that people attach to gender which affects the way the individual child behaves, acts and thinks.

Anonu (2015) carried out a research on the effect of realia in teaching on student achievement in biology. He used pre-test, post-test control group quasi-experimental design in a class of 120 students in SS3 class. One group of students was taught using realia while the control group of 60 students was taught using lecture method. The data collected using biology achievement test (BAT) were analyzed using ANOVA. It was realized that those students taught using realia performed equally better and were able to acquire deeper understanding of the topic taught. The researcher concluded that realia helps in acquiring more information.

RESEARCH METHODOLOGY

A quasi-experimental methodology was adopted for the study. The population of the study comprised of all the Basic Science and Technology students in Junior Secondary School two (JSS2) in the study area, which consisted of 2,442 students drawn from eleven (11) public secondary schools in the Local Government Area. A sample of 120 students was selected using a simple random sampling technique. The sample size was drawn from 4 randomly selected public secondary schools.

The instrument used for data collection was a Students' Performance Test (SPT). The researcher visited the selected schools and obtained permission from the respective principals of each of the schools. The researcher administered a pre-test. The scores of both the pre-test and post-test were used for analysis. The hypothesis was tested using an independent t-test statistical method. The researcher designed a lesson on the topic "Pollination" and then divided the students into two experimental groups: one group was taught with reality and another group was taught with a chart. The scores obtained were used for analyses. An independent t-test statistical method was used for data analysis.

PURPOSE OF THE STUDY

The purpose of this study was to determine the effect of reality and chart on students' academic performance in Basic Science and Technology in Ethiope Local Government Area. Specifically, the study sought to:

1. Determine the difference in academic performance of male and female students in Basic Science and Technology taught with the use of chart.
2. Determine the difference in the academic performance of Basic Science and Technology students taught using reality and those taught using chart.
3. Determine the difference in the academic performance of Basic Science and Technology students taught using reality and those taught using chart.
4. What is the mean difference in the academic performance of Basic Science and Technology students in population when taught using reality and those taught using chart?
5. What is the mean difference in the academic performance of male and female Basic Science and Technology students in population when taught using chart?

HYPOTHESIS

The following null hypotheses were formulated to guide the study and were to be tested at 0.05 level of significance:

1. There is no significant difference in the academic performance of Basic Science and Technology students taught using reality and those taught using chart.
2. There is no significant difference between the mean academic performance of male and female students in Basic Science and Technology taught using charts.

Analysis

Hypotheses. There is no significant difference in the academic performance of Basic Science and Technology students taught using value and those taught using a chart.

Table 1: Analysis of the difference between two known groups of Basic Science and Technology students taught using value versus using a chart.

Variables.	N	X	SD	DF	t-cal	t-crit	Decision
Experimental	60	57.3	14.4				
Control	60	54.3	13.4	118	5.28	2.50	Rejected

The findings in Table 1 show that the calculated t-value of 5.28 is greater than the critical t-value of 2.50 at 118 degrees of freedom at the 0.05 level of significance. Therefore, the hypothesis is rejected.

Hypothesis Two: There is no significant difference in the academic performance of male and female Basic Science and Technology students taught using value.

Table 2: Analysis of the difference between two main groups of male and female students taught using the data.

Variables.	N	X	SD	DF	t-cal	t-crit	Decision
Male	24	69.0	8.35				
Female	36	61.4	14.7	58	0.20	2.01	Accepted

The findings in Table 2 show that the calculated t-value of 0.20 is less than the critical t-value of 2.01 at 58 degrees of freedom at the 0.05 level of significance.Therefore, the hypothesis is accepted.

DISCUSSION OF FINDINGS

The findings of the study revealed that there is a significant influence of the used of radio in teaching Basic Science and Technology in students performance in Social Studies in Uruan Local Government Area. The findings of the study in item one revealed that students taught Basic Science and Technology with the used of radio compared those taught without the used of radio performed academally better.

Similarly Idiong (2020) asserted that its revealed that students performed best when taught by using radio in teaching Basic Science and Technology in learning and leads to better academic performance of students.

Similarly the finding of the study in Table II revealed there there is no significant difference in the academic performance of male and female Basic Science & Technology students taught using radio technology than those taught without technology in secondary

school in Uruan LGA.Akpa & John (2022) have also revealed that male and female students performed simentainiously (together) on Basic Science students taught with radio.

CONCLUSION

Based on the findings of the study the results established that the used of radio in teaching Basic Science & Technology using radio performed academally better than those not using radio, male and female students performed simentainiously (both) when taught with radio.

RECOMMENDATIONS

Based on the findings of the study the following recommendation were drawn;

- There is need for teachers to adopt the used of radio in teaching Basic Science and Technology in secondary school and reduce teaching challenges.
- There is need for the Federal & State Ministry of Education to provide radios to schools both in rural & urban areas, and they should also encourage the used of radio through organizing of seminars & workshops to teachers on effective utilization of radio in teaching.

REFERENCES

Abah, J. (2016). Use of realia as tools for supplementing instructional delivery. Journal of Educational Materials, 4(2), 55–63.

Adeyemi, T. O. (2010). Teachers' instructional strategies and students' academic performance in science subjects. International Journal of Educational Research, 2(1), 20–29.

Akpa, U., & John, M. (2022). Gender differences in students' performance in Basic Science taught with radio technology. Journal of Science Education Research, 10(1), 44–52.

Anonu, S. (2015). Effect of realia on students' achievement in biology in senior secondary schools (Unpublished master's thesis). University of Nigeria.

Bello, R. (2012). Instructional charts as effective tools in teaching. Nigerian Journal of Educational Technology, 6(1), 73–81.

Doll, P. (2015). The effectiveness of charts in small-group instructional settings. Journal of Instructional Media, 12(3), 110–118.

Idiong, E. (2020). Radio as an instructional material for Basic Science and Technology and students' performance in Akwa Ibom State. Journal of Educational Development, 8(2), 25–33.

Mohammed, A. (2017). Effect of charts on instructional material quality and students' academic performance in biology in Zaria. African Journal of Science Education, 5(1), 15–24.

Nneji, P. O. Oshodi, P. A. Akomolede, S. K. Olayemi, J. O. Oboite, D. U. Tochi, N. S. Iweuno, B. N. Stanley, N. E., Badmus, A. H., Samson, K. A., & Adenuga, A., (2024). The Impact of Practical Work Experience on Academic Achievement in Biology among Senior Secondary School Students in Yenagoa Metropolis. Journal of Education, Society and Behavioural Science. 37(5), 50-57.

Ogbu, K. (2020). Realia and learner motivation in science classrooms. International Journal of Science Education, 14(2), 90–99.

Okoye, F., & Olay, B. (2013). Realia as instructional supports for effective learning in Nigerian classrooms. West African Journal of Pedagogy, 3(1), 21–30.

Olay, B. (2018). Impact of real objects in facilitating learning among secondary school students. Journal of Innovative Teaching, 9(2), 58–66.

Owoeye, S. A. (2015). Effect of learning materials on students' academic performance in biology in Kano State. Journal of Biology Education, 7(1), 33–41.

Ricardo, M. (2018). Realia as tools for enhancing classroom instruction. Educational Research Review, 11(4), 210–218.

Sambo, D. D. & Sunday, B. E., (2024). Influence Of School Environmental Factors On Students Academic Achievement And Interest In Core Science Subjects In Uyo Senatorial Districts Of Akwa Ibom State, Nigeria. International journal of advancement in education, management, Science and technology, 7(1), 1-2.

Suleiman, A. (2016). Effect of instructional materials using realia on geography students' academic performance in Hong Local Government Area. Journal of Geography Education, 4(1), 12–22.