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Effect of Mini-Anchor-Chart on Interest of Basic VIII Students with Varied Learning Rapidity in Basic Science in Obudu, Cross River State

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Abstract
This study examined the effect of Mini-Anchor-Chart teaching strategy on interest of varied learning rapidity Basic VIII students in Basic Science in Obudu, Cross River State. Two research questions and two hypotheses guided the study. A pre-test post-test quasi-experimental control group research design was used. Out of the 3,048 Basic VIII students in the 32 government-owned upper basic schools in Obudu, 68 were drawn from two intact classes in two schools using a multistage sampling technique. Basic Science Interest Scale (BSIS) with reliability coefficient of 0.916, determined using Cronbach's Alpha was used for data collection. Mean and standard deviation were used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. The findings of the study showed that, there is a significant difference in the interest level between students taught Basic Science using Mini-Anchor-Chart Strategy and Expository Teaching in favour of MACS [F (1,65) = 229.273; ρ = 0.000 < 0.05]. However, there was no significant difference in the interest level of students taught Basic Science using MACS based on learning rapidity [F (2,30) = 1.639; ρ = 0. 211> 0.05]. Therefore, it was recommended among others that Mini-Anchor-Chart Strategy be used for Basic Science teaching at the upper basic education level.

Keywords: Mini-Anchor-Chart Strategy (MACS), Basic Science, Interest, Learning Rapidity, Students

Introduction

The development of any nation is connected to the educational system in operation, with specific reference to the basic education. It is the intermediary between primary and tertiary education which is responsible for the production of manpower for the overall development of a nation. Advances in Science and Technology are transforming the world in an incredible manner. Science generally is a body of knowledge which deals with nature. It is part of our daily lives ranging from cooking and gardening to recycling and comprehending the daily weather report to reading a map and using a computer (Odoh & Ajio, 2021). Basic Science is a concept in science teaching in Nigeria that came to replace integrated science (Ayua et al., 2023). Before 1999, Basic Science was taught as Integrated Science at the junior secondary school level. However, in 1999, the Universal Basic Education (UBE) programme was initiated. This changed Integrated Science to Basic Science in the 9-year basic education system.

Basic Science formerly known as Integrated Science and Primary Science is the first form of science a child comes across at the lower basic level. It a core subject in the national curriculum basic level. All students from basic 7-9 classes offer the core subject; and it is considered the bedrock for further and effective science studies at the senior secondary school level (Ayua, et al., 2021; Ayua, et al., 2023). The subject prepares students at the upper basic level for the study of core science subjects (Biology, Chemistry and Physics) at the senior secondary school level (Tofi et al., 2021). The authors further emphasized that for a student to be able to study single science subjects at the senior secondary level successfully; such a student has to be well grounded in Basic Science at the upper basic level. Based on this, it is generally taught as a science subject, until in the senior secondary school level, and then split into specialized science subjects (Biology, Chemistry and Physics). It is expected that those

students who perform well in Basic Science should be given the opportunity to study the various science subjects at the senior secondary school level.
Basic Science is a course of study which presents science discipline in all its ramifications or diversity, in a unit whole so as to appreciate the interdependence of all science disciplines (Agogo & Ode, 2017; Ayua & Jato, 2012). The authors maintained that; the knowledge gained is relevant for man's comfortable living in his environment. The subject encourages exploration of students' immediate environment, as a result, Basic Science teachers continue to learn along with their students. The teaching of Basic Science is therefore, based on the philosophy of active learner-participation in the process whereby students are encouraged to learn by constructing their own knowledge based on what they already understand as they make connections between new information and old information, guided or facilitated by the teacher (Piaget, 1956).

Mini-Anchor-Chart Strategy (MACS) is a learner-centred teaching strategy that uses compact or simplified anchor charts during classroom instruction to enhance learners' meaningful engagement and effective learning. To Adie and Ayua (2025), and Ashley (2021), MACS is seen as a miniature of the traditional anchor chart used to reinforce key concepts during teaching with visual representations which state the principle(s) of the lesson for the students as they apply the principle(s) in their own independent study. Thus, it is a targeted teaching approach using compact, collaborative visual tools to organize content, boost engagement, and enhance understanding of key concepts. By focusing on specific topics, it makes learning more manageable and accessible for students. Mini-Anchor-Charts can be created by the teacher or by the students and they can be displayed on a board or table in the classroom. This method is especially useful for visual learners and for students who need additional support to understand and retain information. Mini-Anchor-Chart Strategy can be used at all levels of instruction (Smith & Johnson, 2020). It promotes active learning and encourages students to construct their own understanding of the concepts being taught. It is believed that this method will help students to learn by enabling them ask questions and get answers which can enhance students' interest in science subjects as compared to other conventional teaching methods.

Interest means attention to something. Interest is a subjective feeling of concentration or curiosity of students in the study of Basic Science. Typhoon International Corporation (2014) defined interest as attention with a sense of concern; lively sympathy or curiosity; and the power to excite or hold such attention in something. Interest is an aspect of affective domain that has to do with one's readiness to like or dislike something. Interest could be aroused in an individual by an activity that tends to satisfy the individuals' need. Students interest in Basic Science refers to the feeling, curiosity, willingness, or persuasion of learners' wanting to know about science and their longing and readiness to be actively involved in its learning, principles and practice (Ammar et al., 2024; Ayua, et al., 2025). This implies that interest in learning Basic Science is not only a powerful psychological trait but also as a predictor variable which, symbolically, is a double-edged sword or bi-directional in effect. This is because the absence or lack of interest in Basic Science results to no or low active participation of learners in science, while its presence fosters active learner participation invariably increasing students' speed to learn (Adedeji, 2017).

Learning rapidity refers to the speed and efficiency with which a student is able to acquire new knowledge or skills. It is an important factor in education, as it determines how quickly and easily a student can learn new information and put into practice (Marks, 2016). There are a number of factors that can affect learning rapidity such as the learner's age, intelligence, and prior knowledge. It is also influenced by the learning environment, the teaching methods used, and the materials provided (Hostetler, 2023). When learners of the same academic capability are put together, teaching them depends on how fast they can grasp. Although each student has a different learning speed, they may typically be categorized into three groups depending on how quickly they pick things up: slow learners, passive or average learners, and quick learners (Dharani et al., 2022; Joseph & Abraham (2023).

Empirically, Gongden and Delmang (2016) in their study "Mini-Anchor-Chart use for the teaching of visually impaired students in Chemistry" found that the use of Mini-Anchor-Charts significantly stimulate students' interest especially the visually impaired students in Chemistry lessons compared to those taught with conventional lecture methods. Likewise, Ayua and Ode (2020) in their study "Science-Technology-Society strategy's effect on students' interest in Basic Science at upper-basic school level" found that there was a significant mean difference in the level of interest in Basic Science between students taught using Science-Technology-Society Strategy (STS) and those taught using Lecture Method (LM) in favour of those taught using STS. Also, Tafi et al. (2024), in their study "Effect of Peer Tutoring Strategy on students' interest in Basic Science and Technology in Abuja metropolis,

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Nigeria" found significant differences in the interest ratings of students taught using Peer Tutoring Strategy and their counterparts taught using conventional method of teaching in favour of those taught using Peer Tutoring Strategy. In the same vein, Ayua, et al. (2025) in their study "Science-Text-Cards' effect on interest in science among upper basic school students with varied conceptual abilities in Makurdi, Nigeria" found a significant difference in the interest level of students taught Basic Science using Science-Text-Cards (STC) and those taught using Recitation Teaching Method (RTM) in favour of STC, however, no significant difference was found in the interest level among students with varied conceptual ability levels taught Basic Science using STC; implying a homogeneous increase in students' interest level in Basic Science across varied conceptual abilities.

Statement of the Problem

Developing students' interest in Basic Science is one of the objectives of science education. The overall objectives of the Basic Science curriculum at the basic education level includes developing students' interest in science, enabling students to apply the scientific knowledge and skills to meet societal needs. This is expected to enable students take advantage of the numerous career opportunities offered and becoming prepared for further studies in science and technology (National Educational Research and Development Council [NERDC], 2012). But unfortunately, students are exhibiting lack of interest in the subject (Enemarie et al., 2019; Nwafor, 2024). The authors maintained that, traditional teaching methods may not enhance students' learning rate and reasoning abilities as students may find scientific concepts abstract and difficult to relate to their everyday experiences.

Aim and Objectives of the Study

The aim of the study was to examine the effect of Mini-Anchor-Chart on the interest of basic VIII students with varied learning rapidity in Basic Science in Obudu, Cross River State. The objectives were to:

1. Ascertain the effect of Mini-Anchor-Chart Strategy on students' interest in Basic Science.
2. Determine the effect of Mini-Anchor-Chart Strategy on students' interest in Basic Science based on learning rapidity.

Research Questions

1. What is the difference between the interest level of students taught Basic Science using Mini-Anchor-Chart Strategy and those taught using Expository Teaching?
2. What is the difference among the mean interest levels of students taught Basic Science using Mini-Anchor-Chart Strategy based on learning rapidity?

Hypotheses

1. There is no significant difference between the interest levels of students taught Basic Science using Mini-Anchor-Chart Strategy and those taught using Expository Teaching.
2. There is no significant mean difference among the interest levels of students taught Basic Science using Mini-Anchor-Chart Strategy based on learning rapidity.

Materials and Methods

The study was conducted using a pre-test post-test non-randomized quasi-experimental control group research design. This research design was used for two primary reasons. Firstly, this design allows researchers to assess the effectiveness of an intervention or treatment by comparing the outcomes between a treatment group and a control group, while accounting for potential pre-existing differences between the groups (Campbell & Stanley, 1963). Secondly, in situations where random assignment of participants to groups is not feasible or ethical, this design provides a viable alternative for evaluating the impact of an intervention, thereby increasing the generalization of findings to real-world settings (Shadish et al., 2002; Emaikwu, 2021). The population of the study consisted of 3,048 basic VIII students in the 32 government-owned upper basic schools in Obudu Local Government Area of Cross River State. A sample of 68 basic VIII students in two intact classes was used for the study; 34 students each for experimental and control groups respectively. The sampling was done using multi-stage sampling (including stratified, purposive and simple random sampling) technique. Based on learning rapidity, the experimental group had 12 fast, 12 moderate and 10 slow learners, while the control group had 11 fast, 14 moderate and 9 slow learners. The grouping of students based on learning rapidity was done using Students' Learning Rapidity Classification Quiz (SLRCQ). Basic Science Interest Scale (BSIS) adapted from Ayua et al. (2025) was used for data collection. BSIS is a 20-item Likert type scale instrument with four responses of High Interest Level (HIL = 3), Average Interest Level (AIL = 2), Low Interest Level (LIL = 1), and No Interest (NI = 0). Basic Science Interest Scale (BSIS) was validated by two experts in Science Education and one expert

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in Mathematics Education at Rev. Fr Moses Orshio Adasu University, Makurdi. The BSIS was trial tested on 27 students from one of the upper basic schools in the study area who were not part of the actual sample for the study and it yielded a reliability coefficient of 0.916 which was determined using Cronbach's Alpha. Mean and standard deviation were used to answer the research questions whereas, Analysis of Covariance (ANCOVA) was used to test the null hypothesis at $P \leq 0.05$ level of significance.

Results

The results of the study were presented in order of the research questions and hypotheses as follows:
Research Question One: What is the difference between the interest level of students taught Basic Science using Mini-Anchor-Chart Strategy and those taught using Expository Teaching?

Table 1: Mean and Standard Deviation of Students' Interest Level based on Teaching Methods.

Method	Sample (n)	Pre- Interest		Post-Interest		Mean Gain	Mean Gain Difference
		Mean	St. D	Mean	SD		
MACS	34	25.12	6.37	42.65	3.69	17.53	**17.41**
Expository Teaching	34	25.18	6.31	25.06	6.18	0.12	

The results in Table 1 revealed that students taught Basic Science using Mini-Anchor-Chart Strategy (MACS) had interest level mean scores of 25.12 with a standard deviation of 6.37 in the pre-interest and 42.65 with a standard deviation of 3.69 in the post-interest. Students taught Basic Science using Expository Teaching (ET) had interest level mean scores of 25.18 with a standard deviation of 6.31 in the Pre-interest and 25.06 with standard deviation of 6.18 in the post-interest correspondingly. Table 1 further showed that students taught using MACS had mean gain interest score of 17.53 while those taught using ET had a mean gain interest score of 0.12. Thus, there was a mean gain difference of 17.41in favour of students taught Basic Science using Mini-Anchor-Chart Strategy (MACS). This showed that students taught using MACS increased interest level more as compared to those taught using ET.

Research Question Two: What is the difference among the mean interest levels of students taught Basic Science using Mini-Anchor-Chart Strategy based on learning rapidity?

Table 2: Mean and Standard Deviation of Interest level of Students with Different Learning Rapidity Taught Basic Science using Mini-Anchor-Chart Strategy.

Learning Rapidity	Sample (n)	Pre-Interest		Post- Interest		Mean Gain	Mean Gain Difference
		Mean	St. D	Mean	St. D		
Slow	10	25.70	5.98	41.40	3.13	15.70	
Moderate	12	22.58	7.27	42.00	1.81	19.42	$1.46 \leq 3.72$
Fast	12	27.17	5.27	44.33	4.96	17.16	

The result in Table 2 revealed that slow learners taught Basic Science using Mini-Anchor-Chart Strategy (MACS) had interest level mean scores of 25.70 with a standard deviation of 5.98 in the pre-interest and 41.40 with a standard deviation of 3.13 in the post-interest. Also, students with moderate learning rapidity taught Basic Science using Mini-Anchor-Chart Strategy (MACS) had interest level mean scores of 22.58 with a standard deviation of 7.27 in the Pre-interest and 42.00 with a standard deviation of 1.81 in the post-interest. Fast learners taught Basic Science using Mini-Anchor-Chart Strategy (MACS) had interest level mean scores of 27.17 with a standard deviation of 5.27 in the Pre-interest and 44.33 with a standard deviation of 4.96 in the post-interest. Furthermore, Table 2 showed that low, average and high learning rapidity students taught using MACS had mean gain scores of 15.70, 19.42 and 17.16 respectively. Table 2 showed a mean gain difference of the learning rapidity students which falls within the range of $1.46 \leq 3.72$.

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1 There is no significant difference between the interest levels of students taught Basic Science using Mini-Anchor-Chart Strategy and those taught using Expository Teaching.

Table 3: ANCOVA Summary of Students' Interest Level Based on Teaching Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5474.797[a]	2	2737.398	119.118	.000	.786
Intercept	2814.444	1	2814.444	122.471	.000	.653
Pre-interest	215.914	1	215.914	9.396	.003	.126
Teaching Method	**5268.803**	**1**	**5268.803**	**229.273**	**.000**	**.779**
Error	1493.733	65	22.981			
Total	84898.000	68				
Corrected Total	6968.529	67				

a. R Squared = .786 (Adjusted R Squared = .779)
b. Computed using alpha = .05

The ANCOVA statistic summary in Table 3 shows that, F (1,65) = 229.273; ρ = 0.000 < 0.05. This suggests that the probability level is less than the specified alpha of 0.05. Therefore, the null hypothesis was rejected. This means that, there was a significant difference in the interest level of students taught Basic Science using MACS and those taught using the ET in favour of those taught using MACS. This implies that MACS significantly increases students' interest level in Basic Science more than ET. The partial eta squared value of 0.779 was considered as a large effect size, indicating that MACS has a substantial impact on students' interest level. This means that approximately 77.9% of variance in students' interest levels can be attributed to the difference between the two teaching methods.

2 There is no significant mean difference among the interest levels of students taught Basic Science using Mini-Anchor-Chart Strategy based on learning rapidity.

Table 4: ANCOVA Summary of Students' Interest Level Based on Learning Rapidity.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	92.422[a]	3	30.807	2.586	.072	.205
Intercept	2630.008	1	2630.008	220.797	.000	.880
Pre-interest	37.724	1	37.724	3.167	.085	.095
Learning Rapidity	**39.038**	**2**	**19.519**	**1.639**	**.211**	**.098**
Error	357.343	30	11.911			
Total	62288.000	34				
Corrected Total	449.765	33				

a. R Squared = .205 (Adjusted R Squared = .126)
b. Computed using alpha = .05

The ANCOVA statistic summary in Table 4 indicates that, F (2,30) = 1.639; ρ = 0. 211> 0.05. This shows that the probability level is greater than the stated alpha of 0.05. Thus, the null hypothesis was not rejected. This agrees that there was no significant difference in the interest level among students with different learning rapidity taught Basic Science using MACS. This explicates that MACS is effective for teaching varied learning rapidity Basic Science students and has no bias in enhancing students' interest in Basic Science irrespective of their learning rapidity differences. The partial eta squared value of 0.098 was considered as a small effect size, indicating essentially equivalent increase of interest level mean scores of students with different learning rapidity taught using MACS. This means that approximately 9.8% variance of students' interest can be attributed to no statistically significant difference among students with different learning rapidity.

Discussion

Regarding students' interest level in Basic Science based on their exposure to teaching methods, findings of this study revealed that the interest level of students taught Basic Science using Mini-Anchor-Chart Strategy (MACS) significantly increased compared to those taught using Expository Teaching (ET). The significant increase in

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students' interest level recorded in the MACS group over ET is not strange, this is because Mini-Anchor-Chart Strategy offer opportunities for all students to collaborate, engage in independent reading, actively participate, interact with charts and with one another during the lesson delivery, thus, increasing interest to learn meaningfully for lasting functional education. This finding agrees with that of Gongden and Delmang (2016) who found that the use of Mini-Anchor-Charts significantly stimulate students' interest in science lessons in comparison to conventional teaching methods. Likewise, the finding of this study is similar to those of Ayua and Ode (2020), and Ayua et al. (2025), and Tafi et al. (2024) who found a significant increase in students' interest level in Basic Science when exposed to constructivist teaching strategies, as compared to non-constructivist teaching methods.

Concerning students' interest level based on their learning rapidity, findings revealed that there was no significant difference in the interest level among students with different learning rapidity taught Basic Science using Mini-Anchor-Chart Strategy (MACS). This finding implies that the interest level of Basic Science students can be homogenously enhanced irrespective of the differences in their learning rapidity when they are taught using Mini-Anchor-Chart Strategy. This is because MACS is learner-centred and as such enabled students to generate ideas, organize information, express and question ideas during learning which enhanced interest in the subject that made it possible for learners to better understand concepts learnt. All students irrespective of their learning rapidity level showed more confidence in answering questions and with time participated more in the discussion and engaged actively in meaningful communication with anchor charts. This finding of no significance difference in interest level among varied learning rapidity students taught Basic Science using MACS is similar to that of Ayua et al. (2025), and Adie and Ayua (2025) who also found no significant difference among different conceptual and reasoning ability students taught Basic Science using Science-Text-Cards and MACS.

Conclusion

Based on the findings of the study, it was concluded that: Mini-Anchor-Chart Strategy (MACS) homogenously enhances students' interest in Basic Science irrespective of their differences in learning rapidity.

Recommendations

To this end, the following recommendations were made:

1. Teachers should use Mini-Anchor-Chart Strategy to ensure meaningful and functional teaching and learning of Basic Science at the basic education level in Nigeria.
2. Ministry of Education at both the federal and state levels should encourage the use of Mini-Anchor-Chart Strategy among Basic Science teachers in the classroom by funding workshops, conferences and refresher courses for teachers to ensure meaningful teaching and learning.
3. Principals and supervisors of Basic Science teaching and learning should note that Mini-Anchor-Chart Strategy enhances students' interest irrespective of their differences in learning rapidity, and as such should encourage the use of Mini-Anchor-Chart Strategy in teaching to improve students' interest level in Basic Science.

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