EFFECT OF INTEGRATED INQUIRY-BASED SCIENCE TEACHER PRACTICES ON BASIC EDUCATION STUDENTS' INTEREST IN TARABA STATE, NIGERIA

BY

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ABSTRACT

The purpose of this study was to examine the effect of Integrated Inquiry-Based Science Teachers Practice on Basic Education Students' Interest in Basic Science in Jalingo Education Zone, Taraba State Nigeria. Three specific objectives with corresponding research questions and two hypotheses guided the study. The study adopted a quasi-experimental research design of non-equivalent research design of non-equivalent group. Intact classes were assigned to both the experimental group (Integrated Inquiry-Based Teachers Practice Instructional Strategy) and control group(guided Inquiry Instructional Strategy) using multi stage sampling technique. The sample for this study is 292 Basic Education students comprising of 139 boys and 153 girls from six public secondary schools. Data for this study was generated using Basic science students Interest scale (BSSIS). Cronbach's Alfa Coefficient was used to reliability coefficient of BSSIS and reliability index of 0.87 was obtained. Mean and standard deviation were used to answer all research questions. While analysis of covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance. Based on the data collected and analyzed the following findings were recovered: there was significant different in the mean interest rating of students taught Basic Science using integrated-inquiry-based science teacher practice and those taught using guided inquiry instructional strategy, The study therefore, recommended that; i. Basic Science Teachers should be encouraged to use integrated inquiry-based science teacher practice. Instructional strategy and Basic science teacher's trainees should be trained on the use of this instructional strategy which could improve academic performance of Basic Education student. ii. Curriculum planners and science teachers should be incorporate innovative, problem solving and activity based pedagogical strategies like inquiry based instructional strategy in all teacher education instructions. iii. Professional bodies like Science Teachers Association of Nigeria (STAN) in collaboration with the Nigeria Education Research and Development center (NERDC) and Federal Ministry of Education should organize seminars, workshops and symposia on the use of inquiry based instructional strategy for science teachers at the federal, State and Local Government levels.

Keywords: Integrated Inquiry-Based Science, Teacher Practices, Basic Education and Students' Interest

Introduction

Science is the pursuit and application of knowledge and understanding of the natural and social world following a systematic methodology based on evidence; it is the observation, identification, description, experimental investigation and theoretical explanation of natural phenomenon. Science is a systematic investigation of nature with a view to understanding and harnessing them to serve human needs (Okoro, 2013). The importance of science has led scientist to strategizing on how to develop science and technology to earn national and international recognition. The world is becoming a global market with every nation struggling to control it through scientific investigation with capacity to attract global acceptances. The scientific development of a nation is dependent on the level of scientific knowledge of her citizenry (Abungwa, Okene & Wachanga, 2014). Therefore, science being the foundation for sustainable development is undeniably and unquestionably a key to national economic growth and prosperity. In the current information and technology age, when scientific information increases day by day, technological innovations advance rapidly, it is clearly seen that education in science plays a key role for the future of the society because the effects of science are seen overtly in every aspect of our lives. This could be one of the reasons science concepts is taught at the Primary School in the form of Basic Science.

Basic science is the science subject designed to expose learners to scientific and technological knowledge and skills that will assist them to make informed decisions, develop strategies and learn to contribute meaningfully in the contemporary society (Ellah & Achor, 2017). This implies that acquisition of adequate knowledge in the subject could equip the learner with what it takes to become useful to the society and also to be prepared for further studies in science thus fulfilling, the National goals of Education in Nigeria (NPN, 2014). On the same note, Ayodele (2016) submitted that Basic Science is the bedrock of future understanding of advanced studies in Science, Technology and Engineering. This shows that the concept if well-captured could prepare the learner for further studies in science at the secondary school level of Education as insinuated by Oludipe (2012). This submission implies that the subject is the foundation of science education in Nigeria

The subject introduces learners to the basic rudiments of science at primary Education level. The National Policy on Education defines Basic Science as the aspect of education which leads to acquisition of practical and applied basic scientific knowledge. The main reason for teaching Basic Science is to widen the knowledge of students in science which enables them to appreciate the unity among science subjects and apply what they have learnt to real life situation (Nwafor, 2016). This submission by Nwafor indicates the need for learners to excel in basic science.

Despite this importance of basic science to life, students perform poorly in Basic Science as documented in the Education Resource centre of Taraba State Ministry of Basic and Secondary Education report of BECE results for Basic Science and Technology (BST) from 2013-2022. Statistics of results revealed poor performance by students in Basic Science (see Details of students' results in Appendix E Page 139). From the analysis, it is clear that there is a trend of poor performance as performance was inconsistent and score per year range. There is no appreciable improvement in academic performance of students in Basic Science in BECE between the years 2013 – 2022.

Feedback is defined as a process by which teachers and students provide response during instruction to organize the learning and teaching process in order to increase students' performance. Feedback could be viewed as a valid and vital part of blending teaching and assessment. There are four main components of feedback as a process of formative assessment. These are explaining learning objectives and success criteria, increasing the quality of marking/feedback/record keeping, using self and peer assessment and increasing the quality of inquiry/dialogue (William, 2011). For the components of teacher feedback stated above to be realized, Effective inquiry is needed.

Inquiry as submitted by Danjuma (2015) is an approach to learning that involves a process of exploring the natural or material world, and that leads to asking questions, making discoveries, and testing those discoveries in the search for new understanding. The term inquiry is used to invoke the idea of teaching science in the way it is actually practiced by scientists, that is, problem-solving through formulating and testing hypothesis Teachers use varieties of assessment activities and strategies in problem-solving to gain comprehensive insight into how much students learn via feedback integrated-inquiry-based as an instructional strategy in science practice.

The learners' interest is a fundamental factor in the learning process. Ajayi (2017) maintained that the elements of interest are cognitive, affective and behavioural. Affective is the feeling aspect of interest. This is seen when a person attaches his emotions to the perception he has about somebody or something. For instance, when a student that likes basic science is connecting his emotion through likeness to the perception he has towards science subject. The behavioural element of interest refers to the physical show. It is the outward behaviour of interest. Kinds of interest include cognitive interest which refers to interest that comes as a result of certain action and affective interest which refers to interest that may be developed following the way a teacher presents a learning material in a particular subject. According to Ardodo and Gbore, (2012) students' interest in science is a strong predictor of their achievement; hence, science teachers should endeavour to use good innovative strategies that can stimulate students' interest in their attempt to make the learning of science more effective and meaningful to learners. Researchers have reported positive relationships between students' interests and academic performance (Adekunle & Femi-Adeoye, 2016).

The constructivist beliefs would be applied in the current study using feedback integrated-inquiry-based to determine its effect on students' beliefs, interest and academic performance in Basic Science in Taraba State, Nigeria. There is persistent low academic performance of students in Basic Science over the years under review (BECE results 2013 – 2022). This poor performance of students in Basic Science is taken as a wake-up call to re-examine the methodologies in use, to prevent it from constituting a clog on the wheel of educational progress of Nigerian learners at the primary school level offering Basic Science. This is because a credit pass in Basic Science is required for admission into secondary school to learn science subjects that may enable them study Medicine, Pharmacy, Nursing and other Science related disciplines at the university level. It therefore follows that there is the need for science educator to check students' poor performance in basic science during basic education level, program at the primary education to avoid low enrolment into sciences at the secondary school education level. Therefore, there is an urgent need for an innovative teaching strategy such as

feedback integrated-inquiry-based that could improve students' beliefs, interest and academic performance in Basic Science.

Purpose of the Study

The purpose of this study was to investigate the effect of integrated inquiry-based science teacher's practice on students' interest in Basic Science in Taraba State, Nigeria.

Specific objectives of the study were to:

1. Determine the effect of integrated-inquiry-based science teacher practice instructional strategy and guided inquiry instructional strategy on students' interest towards Basic Science.
2. Ascertain the effect of using integrated-inquiry-based science teacher practice and guided inquiry instructional strategy on male and female students' interest towards Basic Science.
3. Determine the interaction effect of gender and instructional strategy on students' interest towards Basic Science.

Research Questions

The study was guided by the following research questions:

1. What is the mean rating of the effect of integrated-inquiry-based science teacher practice instructional strategy and guided inquiry instructional strategy on students' interest towards Basic Science?
2. What is the mean rating of the effect of using integrated-inquiry-based science teacher practice and guided inquiry instructional strategy on male and female students' interest towards Basic Science?
3. What is the interaction effect of gender and instructional strategy on students' interest towards Basic Science?

Hypotheses

The following hypotheses were formulated to be tested at 0.05 level of significance

1. There is no significant difference in the mean interest ratings of students taught Basic Science using integrated-inquiry-based science teacher practice and guided inquiry instructional strategy.
2. There is no significant difference in the mean interest ratings of male and female students taught Basic Science using integrated-inquiry-based science teacher practice and those taught using guided inquiry instructional strategy.

Materials and Methods

Research Design

The research design that was adopted for the study was quasi-experimental design.

Area of Study

The study was conducted in Jalingo Education Zone of Taraba State, Nigeria. Jalingo education zone is made up of three local governments namely; Ardo-kola local Government, Jalingo Local Government and Lau local Government.

Population of the Study

The population of the study consisted of all the 4,141 upper basic II Students from the 50 Public Secondary Schools in Jalingo education zone of Taraba State 2023/2024 academic session, Taraba State Ministry of Education, Post Primary School Management Board. The population of Upper Basic II Students which will consist of 2,338 males and 1,803 females' students

Sample and Sampling Technique

The sample of the study comprised of 292 Upper Basic Education Two students from Jalingo Education Zone. Which was made up of 139 male students and 153 female students randomly drawn from 6 intact classes which constituted the sample for the study? The multi-stage random sampling techniques were used in constituting the sample for the study.

Instruments for Data Collection

The instrument that was used for the study was adapted and organized by the researcher named Basic Science students interest Scale (BSSIS).

Reliability of Instruments

In order to determine the internal reliability of the instruments, 40 copies of the instruments were pilot test at Bali Education Zone of Taraba state which will not be part of the schools for the main study. the instrument was administered at GDSS Bali, the data obtained was analyzed to establish the reliability index of BSSIS. The reliability index obtained was 0.87 for BSSIS. Cronbach alpha was used to establish the reliability index of BSSIS. The index above reveals that the instrument was highly reliable for the study

Method of Data Analysis

Means and Standard Deviation was employed to answer the research questions 1-3 while Analysis of Covariance (ANCOVA) was used to test the null hypotheses 1-2 at 0.05 level of significance.

Results

Research Question One

What is the mean interest rating of students taught basic science using integrated inquiry-based science practice and those taught using guided inquiry instructional strategies? Data answering this question are contained in Table 1.

Table 1: Mean Interest Rating of Students taught Basic Science using Integrated-Inquiry-Based Science Practice Instructional and Guided Inquiry Instructional Strategies

Strategies		PreBSSIS	PostBSSIS	Mean Gain
Integrated Inquiry-Based Science Practice	Mean	1.50	3.38	1.88
	N	138	138	
	Std. Deviation	0.90	0.63	
Guided inquiry instructional strategy	Mean	1.77	2.00	0.23
	N	154	154	
	Std. Deviation	0.92	1.07	
Mean difference				1.65

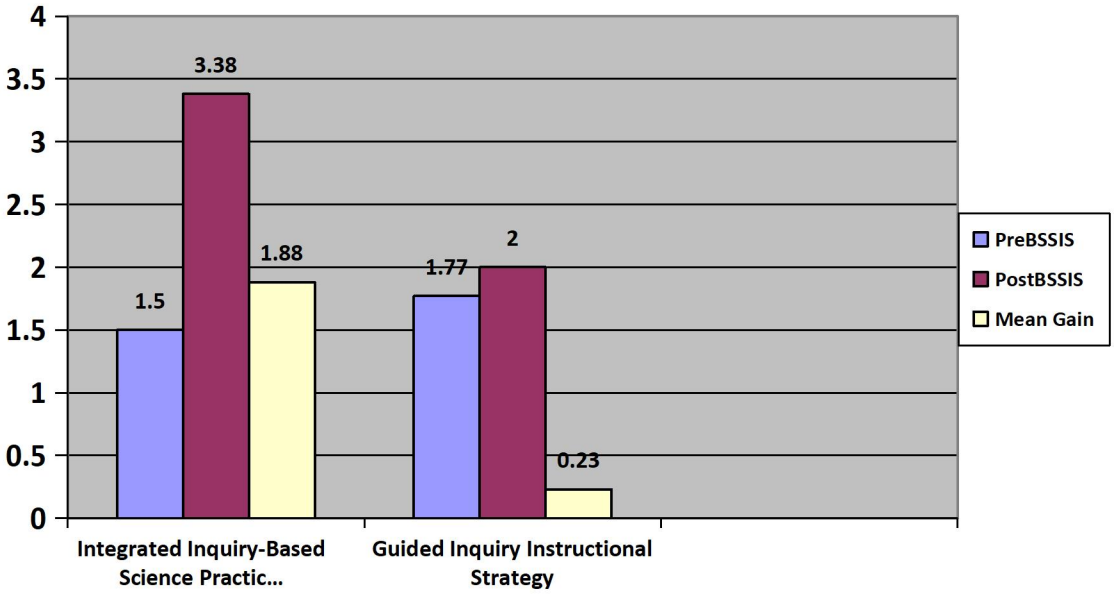


Figure 1: Pretest, Posttest Mean Gain in Interest Rating of Students taught Basic Science using Integrated-Inquiry-Based Science Practice and Guided Inquiry Instructional Strategies.

Table 1 shows the mean interest rating of students taught basic science using integrated inquiry-based science practice and guided inquiry instructional strategies. The table shows that 138 students were taught basic science using integrated inquiry-based science practice instructional strategy and 154 students were taught basic science using guided inquiry instructional strategy. The table reveals that the mean interest rating of students taught basic science using integrated inquiry-based science practice instructional strategy is 1.50 with a standard deviation of 0.90 during pre-test and 3.38 with a standard deviation of 0.63 in post test while the mean interest rating of students taught basic science using guided inquiry instructional strategy is 1.77 with a standard deviation of 0.92 during pre-test and 2.00 with a standard deviation of 1.07 in post test. The table further shows that the mean gain for integrated inquiry-based science practice instructional strategy is 1.88 and guided inquiry instructional strategyis 0.23. The difference in

the mean interest rating of students taught basic science using integrated inquiry-based science practice instructional strategy 1.65 in favour of students in integrated inquiry-based science practice class. The summary of the pretest, posttest mean interest rating as well as the mean gain in the interest rating of students in the strategies is as shown in Figure 1.

Research Question Two

What is the mean interest rating of male and female students taught basic science using integrated inquiry-based science practice? Data answering this question are contained in Table 2.

Table 2: Mean Interest Rating of Male and Female Students taught Basic Science using Integrated Inquiry-Based Science Practice

Gender		PreBSSIS	PostBSSIS	Mean Gain
	Mean	1.53	3.40	1.87
Male	N	65	65	
	Std. Deviation	0.94	0.55	
	Mean	1.50	3.43	1.93
Female	N	73	73	
	Std. Deviation	0.59	0.63	
Mean difference				0.06

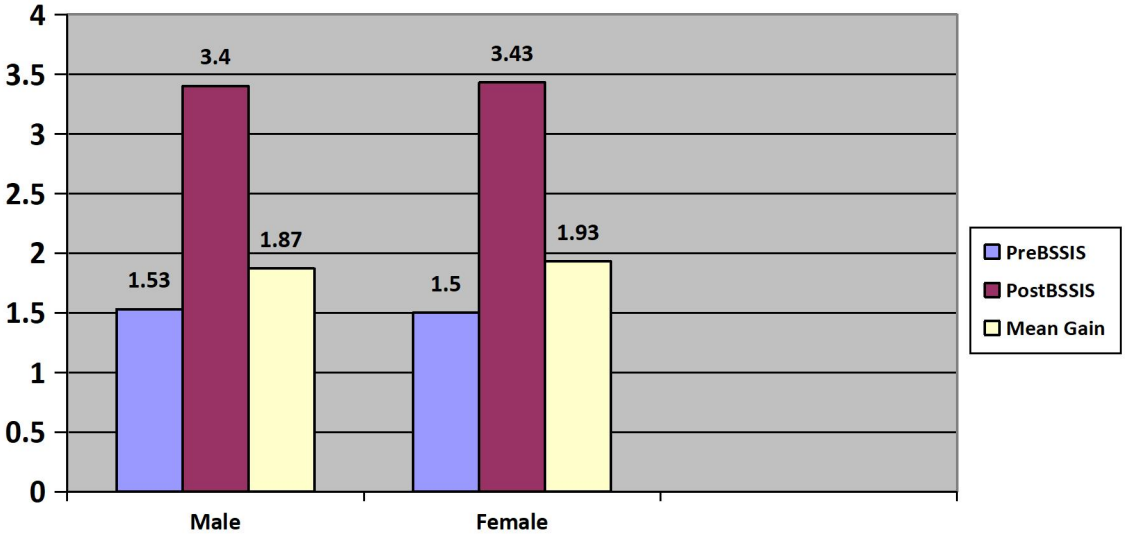


Figure 2: Pretest, Posttest Mean gain in Interest Rating of Male and Female Students taught Basic Science using Integrated Inquiry-Based Science Practice.

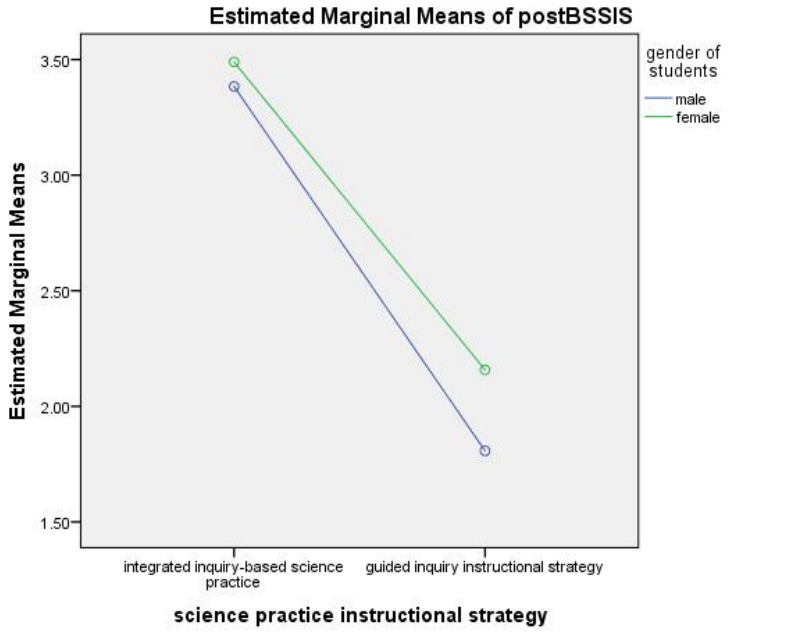
Table 5 shows the mean interest rating of male and female students taught basic science using integrated inquiry-based science practice. The table shows that 65 male students and 73 female students were taught basic science using integrated inquiry-based science practice instructional

strategy. The table reveals that the mean interest rating of male student taught basic science using integrated inquiry-based science practice is 1.53 with a standard deviation of 0.94 during pre-test and 3.40 with a standard deviation of 0.55 in post test while the mean interest rating of female students taught basic science using integrated inquiry-based science practice is 1.50 with a standard deviation of 0.59 during pre-test and 3.43 with a standard deviation of 0.63 in post test. The table further shows that the mean gain for male students is 1.87 and female students are 1.93. The difference in the mean interest of male and female students taught basic science using integrated inquiry-based science practice 0.06 in favour of female students in integrated inquiry-based science practice class. The summary of the pretest, posttest mean interest rating as well as the mean gain in the interest rating of male and female students is as shown in Figure 2.

Research Question Three

What is the interaction effect of gender and instructional strategies on students' interest towards Basic Science? Data answering this question are contained in figure 3.

Figure 3: Interaction Effect of Gender and Instructional Strategies on Students' Interest in Basic Science



Covariates appearing in the model are evaluated at the following values: preBSSIS = 1.6462

In Figure 3, the profile plot shows the interaction effect of gender and instructional strategies on students' interest in Basic Science. The interaction pattern shows that the plots for male and female do not intersect at the integrated inquiry-based science practice. The interaction pattern further shows that the plot for male and female do not intersect at guided inquiry instructional strategy although not parallel lines. This indicates that there is likelihood of an interaction effect of gender and instructional strategies on students' interest in Basic Science when the plot is extrapolated at the integrated inquiry-based science practice, which means that the interaction effect of strategies and gender may be tenable in this case.

Hypothesis One

There is no significant difference in the mean interest ratings of students taught Basic Science using integrated-inquiry-based science teacher practice and guided inquiry instructional strategy. Data testing this hypothesis are contained in Table 4.

Table 4: ANCOVA of Interest Ratings of Students taught Basic Science using Integrated-Inquiry-Based Science Teacher Practice and Guided Inquiry Instructional Strategy

Dependent Variable: postBSSIS

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	173.561[a]	2	86.780	127.375	.000	.469
Intercept	298.657	1	298.657	438.366	.000	.603
Interest	34.652	1	34.652	50.862	.000	.150
Strategies	156.474	1	156.474	229.670	.000	.443
Error	196.895	289	.681			
Total	2434.191	292				
Corrected Total	370.456	291				

a. R Squared = .469 (Adjusted R Squared = .465)

Table 4 reveals that $F(1,289) = 229.670$; $p = 0.000 < 0.05$. Thus, the null hypothesis is rejected. This implies that there is significant difference in the mean interest ratings of students taught Basic Science using integrated-inquiry-based science teacher practice and those taught using guided inquiry instructional strategy. Thus, there is significant difference in the effect of integrated-inquiry-based science teacher practice and guided inquiry instructional strategy on mean interest ratings of students in Basic Science. The partial Eta square of 0.443 obtain for strategies means that 44.3 percent of students' mean interest in Basic Science can be accounted for by the strategies employed.

Hypothesis Two

There is no significant difference in the mean interest ratings of male and female students taught Basic Science using integrated-inquiry-based science teacher practice and those taught using guided inquiry instructional strategy. Data testing this hypothesis are contained in Table 5.

Table 5: ACOVA of Interest Ratings of Male and Female Students taught Basic Science using Integrated-Inquiry-Based Science Teacher Practice

Dependent Variable: postBSSIS

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1.666[a]	2	.833	2.406	.094	.036
Intercept	455.189	1	455.189	1314.681	.000	.911
preBSSIS	1.632	1	1.632	4.714	.032	.035
Gender	.025	1	.025	.073	.787	.001
Error	44.664	135	.346			
Total	1590.119	138				
Corrected Total	46.331	137				

a. R Squared = .036 (Adjusted R Squared = .021)

Table 5 reveals that $F(1,135) = 0.073$; $p = 0.787 > 0.05$. Thus, the null hypothesis is not rejected. This implies that there is no significant difference in the mean interest ratings of male and female students taught Basic Science using integrated-inquiry-based science teachers practice. Therefore, there is no significant difference in the effect of integrated-inquiry-based science teacher practice on mean interest ratings of male and female students in Basic Science. The partial Eta square of 0.001 obtain for gender means that only 0.1 percent of students' mean interest in Basic Science can be attributed to gender.

Discussion

The study investigated the effect of integrated inquiry-based science teacher's practice on students' interest in Basic Science in Taraba State, Nigeria.

Finding revealed that the mean interest rating of students taught basic science using integrated inquiry-based science practice instructional strategy was higher than those taught using guided inquiry instructional strategy. There was significant difference in the mean interest ratings of students taught Basic Science using integrated-inquiry-based science teacher practice and those taught using guided inquiry instructional strategy. This implies that significant difference exists in the effect of integrated-inquiry-based science teacher practice and guided inquiry instructional strategy on the mean interest ratings of students in Basic Science. The finding agrees with Okechukwu and Opara (2021) that there was a significant difference in interest scores of students exposed to Basic Science and Technology using team teaching strategy and their counterparts exposed to Basic Science and Technology using conventional teaching strategy. The finding also agrees with Tekin and Mustu (2021) that the use of research-inquiry based strategies in science courses in research was thus found to have a positive impact on students' academic interests and scientific process skills. The finding agrees with Fatokon (2020) that students taught using mole concept using PBL strategy expressed better interest than those taught using lecture method. The finding agrees with Ojekwu and Oguleye (2020) that there was significant difference in science students' interest scores across the experimental and guided inquiry groups ($P<0.05$) in both cases, students taught with the Jigsaw strategy achieved greater improvement in their mean scores than those taught with the conventional lecture method.

The finding agrees with Ozan and Kincal (2018) that the experimental group in which the formative assessment practices were performed had a significantly better interest toward the class than the students did in the guided inquiry group. The finding agrees with Blazar and Kraft (2017) that students' interests and behaviors are predicted by teaching practices most proximal to these measures, including teachers' emotional support and classroom organization. However, teachers who are effective at improving test scores often are not equally effective at improving students' interests and behaviors. The finding agrees with Yakubu (2016) that there was a significant difference in interest between students taught climate change using Field-based Teaching Strategy and those taught using lecture method in favour of those taught using Field-based Teaching Strategy. The finding agrees with Amir, Mohamed and Mnjokava (2016) that interest, age and gender had significant relationship with students' performance in science subjects. The finding agrees with Ogbonne (2012) that the interest of students taught statistics using the Kumon strategy improved significantly than those taught using the conventional mastery teaching-learning strategy. However, the finding disagrees with Arhin and Yanney (2020) that most students do not have interest in mathematics; the students believe that mathematics has relevance in one's life and one's academics; and also, high or strong relationship exists between students' interest in studying mathematics and academic performance and it is in a positive direction.

The use of integrated-inquiry-based science teacher practice enables the teacher to lead students to inquire into a problem with view to finding some answers or reason why problems exist. The students in integrated-inquiry-based science teacher practice class find answers to question, problems or riddles raised during the learning processes. The present experimental strategy involves the probing; find out, investigating, analyzing and synthesizing, discovery, evaluating, questioning and thinking. These are necessary ingredients for developing positive interest and may be responsible for the significant difference in the mean interest ratings of students taught Basic Science using integrated-inquiry-based science teacher practice and those taught using guided inquiry instructional strategy.

Finding revealed that the mean interest rating of female students taught basic science using integrated inquiry-based science practice was higher than that of male students taught basic science using integrated inquiry-based science practice. There was no significant difference in the mean interest ratings of male and female students taught Basic Science using integrated-inquiry-based science teachers practice. This implies that the use of integrated-inquiry-based science teacher practice is gender friendly with reference to the mean interest ratings of male and female students in Basic Science. The finding agrees with Yakubu (2016) that there was no significant difference in interest between male and female students in the experimental group which implies the teaching strategy is gender-friendly. The finding also agrees with Ogbonne (2012) that there was no significant difference in the level of interest and retention of male and female students in statistics due to the use of the Kumon teaching strategy. However, the finding disagrees with Okechukwu and Opara (2021) that gender has significant difference in interest of students exposed to Basic Science and Technology using team teaching strategy in favour of boys. The finding disagrees with Fatokon (2020) that PBL fostered more interest in male students.

Gender stereotyping permeates basic science class when integrated inquiry-based science practice was used. The present study found no significant difference in the mean interest ratings of male and female students taught Basic Science using integrated-inquiry-based science teachers practice. This implies that the use of integrated-inquiry-based science teacher practice is not gender sensitive with respect to the mean interest ratings of male and female students in Basic Science. The teacher in integrated-inquiry-based science teachers practice class sends male and female students out of the classroom to collect information on a specific topic from either adult in the community or from textbooks, magazines or newspapers. As the male and female students encounter problems, they do not understand, they formulate question, explore problems, observe and applying new information in seeking the better understanding of the world. This may be responsible for the no significant difference found in the mean interest ratings of male and female students taught Basic Science using integrated-inquiry-based science teachers practice.

Finding revealed that the profile plot of the interaction effect of gender and instructional strategies on students' interest in Basic Science shows that the plots for male and female do not intersect although not parallel. There was no significant interaction effect of gender and instructional strategies on students' interest in basic science. This implies that the use male and female students' interest in basic science annulled the interaction effect of integrated-inquiry-based science teacher practice and guided inquiry instructional strategy. However, the finding disagrees with Okechukwu and Opara (2021) that combined effect of exposing students to team teaching strategy and their gender significantly affected their interest in Basic Science and technology. The finding disagrees with Danjuma and Nwagba (2018) that learning strategy and gender significantly interact to increase students' interest in basic science.

Summary

This study examined the effect of integrated inquiry-based science teachers practice on Basic Education student's interest in Taraba state.

1. The mean interest rating of students taught basic science using integrated inquiry-based science practice instructional strategy was higher than those taught using guided inquiry instructional strategy. There was significant difference in the mean interest ratings of students taught Basic Science using integrated-inquiry-based science teacher practice and those taught using guided inquiry instructional strategy.
2. The mean interest rating of female students taught basic science using integrated inquiry-based science practice and male student taught basic science using integrated inquiry-based science practice. There was no significant difference in the mean interest ratings of male and female students taught Basic Science using integrated-inquiry-based science teachers practice.
3. The profile plot of the interaction effect of gender and instructional strategies on students' interest in Basic Science shows that the plots for male and female do not intersect although not parallel. There was no significant interaction effect of gender and instructional strategies on students' interest in basic science.

Conclusion

It is evident from the finding of this study that the use of integrated inquiry-based science teachers practice could provide a good way for Basic Education students to learn Basic Science. The strategy enhanced students' interest in Basic science.

Recommendations

The implication of this study and the associated recommendations as it borders on Basic Education are as follows: -

1. Basic Science Teachers should be encouraged to use integrated inquiry-based science teacher practice.
2. Instructional strategy and Basic science teacher's trainees should be trained on the use of this instructional strategy which could improve academic performance of Basic Education student.
3. Curriculum planners and science teachers should be incorporate innovative, problem solving and activity based pedagogical strategies like inquiry based instructional strategy in all teacher education instructions.
4. Professional bodies like Science Teachers Association of Nigeria (STAN) in collaboration with the Nigeria Education Research and Development center (NERDC) and Federal Ministry of Education should organize seminars, workshops and symposia on the use of inquiry based instructional strategy for science teachers at the federal, State and Local Government levels. If this training is done on regular basis, the science teachers will be proficient in use of innovative instructional strategy like integrated inquiry instructional strategy.
5. Efficacy of the use of integrated inquiry-based science teachers practice in teaching of Basic science and other science subjects needs to be explored. There is need for the Federal Government, Professional associations and corporate bodies to sponsor further research in other areas

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