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Impact of ethnobiology-based instruction and peer tutoring on the achievement of senior secondary school biology students in Ogun State southwest Nigeria

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Abstract

This study investigated the impact of Ethnobiology-Based instruction Peer Tutoring on Achievement of Senior Secondary School Biology Students in Ogun State. The study employed Explanatory sequential mixed-methods approach. The quantitative approach was quasi experimental pretest-posttest non-equivalent group design. Three research questions and one hypothesis was formulated to guide the study. The population of the study comprised of all Biology students in public Senior Secondary Schools in Abeokuta zone. Purposive sampling technique was used to select six Public Schools from two zones (Abeokuta South and Abeokuta North). Biology students in six intact classes of SSS III took part in the study. The sample size of 313 biology students with 101 students in the experimental group 1 (48 male and 53 female), 117 students in the experimental group 2 (57 male and 60 female) and 95 students in control group (38 male and 57 female) which were taught the same biology content for a period of four weeks. The experimental groups received instructions through the use of Ethnobiology-Based Instruction and Peer Tutoring while the control group was taught using lecture method. The data gathering instruments were Biology Achievement Test (BAT) and Students Semi-structured Interview Guide (SSIG). The reliability coefficient of the BAT was established using test- retest and yielded 0.87. Descriptive statistics in form of mean, standard deviation and histogram plot were used to answer the research question while the hypothesis was tested using ANCOVA at 0.05 level of significance. The inferential analysis of hypothesis one has a significant difference on Students' academic achievement in Biology ($F(2,309) = 386.85; p < 0.05$), this indicated that the hypothesis is hereby rejected since a significant difference is obtained. The results from the study revealed that the treatments positively improved the academic achievements of students and the students taught using ethnobiology-based instruction had higher test result and outperformed those in Peer Tutoring and lecture method group, but the students in Peer tutoring group also performed better than those in lecture method group. This implies that Ethnobiology-Based instruction is more effective in enhancing Students' performance in biology and it helps to break barriers to meaningful learning of biology. Based on the findings of this study, it was recommended that Biology teachers should relate learning to students' cultural views and encourage peer tutoring.

Keywords: Biology; Ethnobiology-Based Instruction; Peer tutoring; Gender; Students' Achievement

1. Introduction

The role of science and technology in the development of a nation is glaringly clear to everyone. In most countries of the world including Nigeria, admission quota for science students is often higher than that of those for other disciplines (Chikendu, 2018). However, Akintoye (2016) observed that nations of the world all over, including Nigeria are striving hard to develop scientifically and technologically, since the world is turning scientific and all proper functioning of lives depends greatly on science (Onasanya & Omesewo, 2011. Biology as a subject helps the students to understand more about the structure and functioning of the body. It also gives the understanding of our environment and how living organisms interacts or relates with their environment. The role of Biology in national development is to influence the future of the world.

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Okebukola (2020) echoed that lack of understanding of concepts in biology results in poor performance of students at Senior School Certificate Examination (SSCE) and also causes backwardness in scientific advancement of our nation (Okafor and Okeke, 2006). Several authors echoed that the major factors contributing to poor performance of students in biology is teaching method (Ahmed; Abimbola, 2011, Umar, 2011). Furthermore, what matters to most teachers is to complete the biology curriculum (Umar, 2011); but the reports of failure over the years was that students find some concept difficult probably because they do not understand the concepts and it many likely be due to the medium of instruction by the teacher or the method adopted in teaching the topic. Science education studies argued that we can know nature only through culturally constituted conceptual or epistemological frameworks, enabled by local cultural features such as discursive practices, institutional structures, interests, values and cultural norms (Turnbull, 2000). Few studies have echoed ethnoscience as the knowledge that is indigenous to a particular language and culture or native way of thinking about the physical (Aboniya, 1999; Sanga, 2004; Casagrande, 2004).

Ugwu and Diovu, (2016) opined that teaching and learning science must be grounded and rooted within the culture of an environment, while (Jegede & Aikenhead, 2000) also opined that all learning is mediated by culture and should take place in a social context. Culture is an addition made by humans in the world he did not create and it encompasses the indigenous knowledge, beliefs, art, moral, laws, customs, habits and language acquired by the people of the society. Culture can affect the thoughts, feelings and behavior of individual members within the society (Njok & Edinyan, 2014). Cultural values and peer influence can affect the teaching and learning in biology positively, it can have impact on how students' understand the concept and their way of thinking. Ethnobiology is a branch of ethnoscience and how people categorize things in their environment, it provides important insights into the interest, concerns, and values of their culture. Ethnobiology-Based Instruction is one of the approaches of teaching and learning biology that relates to the cultural values and heritage, the environment and the way of life of students.

However, Ivowi (2014) echoed that it is not what the teacher does in class that matters but what the learner acquired after the lesson though, the teaching methods adopted by biology teacher aimed at bringing about meaningful learning, moreover, teaching methods such as demonstration, discovery, lecture and so on are employed by most science teachers, but the common one mostly used by many biology teachers in Nigeria is lecture method. This could be so due to some advantages of the method in helping to cover a large content area and highly populated class which is a prominent feature in most Nigeria Secondary Schools. In essence, combining lecture method with other unique and effective teaching strategies can enhance positive performance in biology; however employing only lecture method in the teaching of biology might be one of the causes of negative or poor performance in biology and other sciences. Peer tutoring involves the linking of intelligent students with less-intelligent ones. Peer tutoring helps to develop the skills of students to manage and plan learning experiences, work in association, give and receive responses about their activities and finally evaluate their own learning. Peer tutoring helps the tutor in understanding the mental level of the tutees and concept about the topic. The academic achievement of students involved in peer tutoring or collaborative learning is huge (Comfort, McMahon, 2014; Mustafa, 2017; Miao, Henderson, Supple, 2017) and peer tutoring has many features such as students involvements in their own learning, interaction among peers and so on for improving the teaching and learning process. However, variation and evolution was considered as a difficult concept for the students in West African Senior School Certificate Examination according to the chief examiners report (WAEC Report, 2016) and found to be the most difficult concept in biology among Senior Secondary School students (Cimer, 2012; Okebukola, 2020).

The presentation of instructions in biology classrooms to students has been in a way that is not only different from their culture, but may be strange to them which is likely to limit their academic performance in the classroom. The importance of using indigenous (traditional) knowledge in the contextualizing of school science instruction was echoed by Erinsho (2013). As educators, it's our job to stimulate the intellectual development of children and in this era, it's simply not enough to operate on the axis of stereotype teaching method (lecture method), hence, we must take cognizance of the different culture, values, and peer influence affecting the students.

The purpose of this study is to examine the impact of Ethnobiology-Based Instruction and Peer Tutoring of Senior Secondary School Biology Students Academic Achievement and specifically to:

- Examine the impact of Ethnobiology-based instruction and peer tutoring on academic achievement of students
- Examine the relevance of cultural/indigenous knowledge to science and encourage biology teachers to integrate/link life experiences and local knowledge/experiences with biology concepts in the course of teaching.
- Examine the views of students about the impact of Ethnobiology-based instruction and peer tutoring in the teaching and learning of biology.

The following research questions guided the researcher in the conduct of the study:

- Is there statistically significant difference in achievement of students taught using Ethnobiology-based instruction, peer tutoring and lecture method?
- What are the views of students about the impact of Ethnobiology-based instruction in the teaching of biology
- What are the views of students about the impact of peer tutoring in the teaching of biology

In this study the following research hypotheses were generated from the research questions which guided the researcher in the conduct of the study.

HO₁:- There is no statistically significant difference in achievement of students taught Biology with Ethnobiology-based instruction, peer tutoring and lecture method.

2. Material and methods

This study was carried out in six public senior secondary schools located in both the rural and urban areas in two zones (Abeokuta South and North) in Ogun State Southwest of Nigeria where they operate the same academic calendar and scheme of work were purposively selected. Two Schools from Abeokuta South and two from Abeokuta North in Urban and Rural areas formed the experimental group and one School each from Abeokuta South and North in both urban and rural area formed the control group. Biology Students in six non-equivalent intact classes in the selected Schools formed the samples for the study.

This study focus on senior secondary school year three students and the concept of variation and evolution were used because it is a concept in biology that students found to be difficult according to (WAEC Chief Examiner's Report, 2016; Cimer, 2012; Okebukola, 2020). The choice of SS3 students was because the students had gotten enough knowledge in biological concepts and the topic chosen was part of the topic in their scheme of work for SS3, but they have not been taught the topics variation and evolution, that were selected for the study since the topic is 2nd term scheme in the curriculum.

The study involved three levels of treatment Ethnobiology-based instruction, peer tutoring and lecture method as the control. The study employed mixed methods where both qualitative and quantitative methods were involved. The qualitative method employed the use of triangulation design involving semi-structured interview (reporting the interviewers' responses verbatim). Quasi experimental design (pretest-posttest non-equivalent group design) was employed for the quantitative method.

The six classes comprised of male and female Students with (101 for experimental group one, 117 for experimental group two and 95 for the control group. The sample also includes 143 male and 170 female Students. Biology Achievement Test (BAT) and semi-structured interview guide were the instruments that were used to collect the data for study. The students for the semi-structured interview involved eight students that were purposively selected by the research assistants. Their selection was based on their performance in the post test of the achievement tests (Four high and four low achievers) from the experimental group consisting of four male and four female students respectively. The BAT and the semi-structured interview guide was subjected to face content and construct validity. The reliability of BAT instrument was subjected to test-retest and the reliability index was 0.87. Students semi-structured interview guide was used to collect qualitative data on Biology Students views about the impact of the two treatments (Ethnobiology-based instruction and peer tutoring) employed in the study. The six Biology teachers in the six Senior Secondary Schools formed the research team and the four Biology teachers in the experimental Schools were effectively trained on the implementation of Ethnobiology-Based Instruction and Peer Tutoring strategies which are the interventions adopted for the study.

The researcher developed an instructional manual in form of a lesson plan to guide the research assistants to teach the Students using Ethnobiology-Based Instruction. The instruction guides are: Teachers' Instructional Guide on Ethnobiology-Based Instruction, Teachers' Instructional Guide on Peer Tutoring, and Teacher' Instructional Guide on Lecture Method

The teachers inquired about the cultural views of the students on the contents and later added theirs to explain the contents for better understanding. This instructional manual (Lesson plans) consists of the performance objectives, instructional materials, content, procedure of the lesson, activities of both the students and teachers based on the selected concepts. The lesson plan was prepared for four weeks, the lesson duration was double periods, which was 80 minutes, the first week was based on the concept of variation (Morphological and Physiological variation), second week

was application of variation, third week was the concept of evolution (Theory and evidence of evolution), and the fourth week was on fossils records and mutation involving detailed teacher and students activities during the lesson

2.1. For Peer Tutoring

The students were grouped and the intelligent students that assume the position of the tutor teach the tutees for double periods per lesson for four weeks which was 80 minutes.

2.2. For Lecture Group

The research assistant takes the lesson using the prepared lesson plan and lecture method was employed.

2.3. Phase One: Pretest

To determine the achievement of Students in Biology before the treatment; the researcher administered the instrument BAT for one week to all the students in the both the experimental groups and the control groups in the six schools selected for the research. After conducting the pretest, the achievement test questions were collected, marked and the marks over 50 was recorded by the researcher. The researcher did not involve the research assistants in marking of the scripts neither were they informed of their Students performance.

2.4. Phase Two: Treatment

2.4.1. Experimental Group One: Ethnobiology – Based Instruction

The concepts of variation and evolution were taught by the Research Assistants under the supervision of the researcher using the instructional manual prepared by the researcher. The researcher supervises the Biology teachers' thoroughly to ensure they do not deviate from the procedure in the lesson plan. The treatment procedure was schedule for four weeks (two weeks for concept of variation and two weeks for evolution). Following the procedure below:

2.4.2. Steps Involved in the Implementation of Ethnobiology – Based Instruction

- Step 1: At the start of the lesson the teacher introduces the topic /concept to the students
- Step 2: The students were asked to reflect on and narrate their cultural views or cultural practices and beliefs associated with the topic or concept.
- Step 3: The students share the cultural knowledge with their classmate.
- Step 4: The teacher identifies the differences between their culture views and the topic/concept.
- Step 5: The teacher links cultural views to the concept/topic and the interaction between humans and their environment.
- Step 6: The teacher share his/her cultural views that are related to the concept and finally wrap-up the topic.

The teacher taught the students the concept on variation such as the definition of variation, types of variation; morphological variation: color of eye, hair, finger prints and physiological variation(ability to roll tongue ability to taste phenylthiocarbamide (PTC) ability to move the ear without turning the head, ability to close and open one eye for the first week and application of variation in crime detection for example finger print on dangerous weapon, determination of paternity and blood transfusion, for the second week. These concepts in evolution: theory of evolution according to Charles' Darwin, Jean Baptist De Lamarck- Law of use and disuse, Law of inheritance of acquired characteristics/traits , evidence of evolution, fossil records, forces responsible for evolution(mutation, gene flow, gene drift were also taught for the remaining two weeks marking four weeks.

2.4.3. Experimental Group Two: Peer Tutoring

The Students in the second experimental group (peer tutoring) were grouped into ten with one intelligent Student identified by the research assistant act as the tutor after been taught by the research assistant and others in the group were tutees. These groups consisted of both male and female Students and they were taught the same content in variation and evolution as other groups.

2.5. Control Group

The research assistants used the manual prepared by the researcher to teach the concepts in variation and evolution by using lecture method, where the teacher do the talking, while the students listen.

2.6. Phase Three: Post test

The BAT was administered under the supervision of the researcher by the research Assistants to the students in experimental groups after they have been taught the concepts of variation and evolution to determine the impact of ethno biology based instruction and peer tutoring on achievement of the students. The BAT was administered

2.7. Phase Four: Semi Structured Interview

The semi-structured interview involved eight students from the experimental groups selected based on their performance in the achievement test, four high achiever and four low achiever students were selected. The semi-structured interviews were conducted at the end of the treatment, to find out the views of the students about the implementation of impact of the strategies (Ethnobiology-based and peer tutoring) used in teaching the concepts of variation and evolution. The audio recording of the students involved in semi-structured interview were taken by the researcher.

2.8. Data Analysis

The procedures for data analysis in this study are in two ways, since the study employed mixed method where both qualitative and quantitative methods were involved. The data gathered from the achievement tests were analyzed using descriptive and inferential statistics. Percentages were employed to analyze the demographic data, means, standard deviation and Histogram were employed to analyze the research questions, while the research hypothesis were analyzed using Analysis of Covariance (ANCOVA) at 0.05 level of significance by using (SPSS23.0 version) which is statistical package for social science.

The responses of the audio recordings of the semi-structured interview from the students were reported in transcript and the identified themes of relevance were reported thematically.

3. Results

Table 1 Sample size of the study showing Gender

	Gender		Total
	Male	Female	
Method	Peer tutoring48	53	101
	Ethnobiology57	60	117
	Lecture38	57	95
Total143		170	313

3.1. Analysis of Research Questions and Testing of Hypotheses

Research Question 1: Is there statistically significant difference in achievement of students taught using Ethnobiology-based instruction, peer tutoring and lecture method?

Figure 1 showed that the mean score of the pretest for peer tutoring group was 16.52, 14.52 for Ethnobiology-based instruction and 14.49 for lecture group. Figure 1 also showed that there was an increase in the mean score of the students in the three groups in posttest, peer tutoring group (mean = 29.71), Ethnobiology-based instruction (mean = 34.24) and lecture group (mean = 17.17). Although there was an increase in the performance of students in the three groups but the performance of students in the Ethnobiology-based instruction is more than that of the peer tutoring group. The increase in the performance of the students in the lecture group after the administration of the posttest is very small.

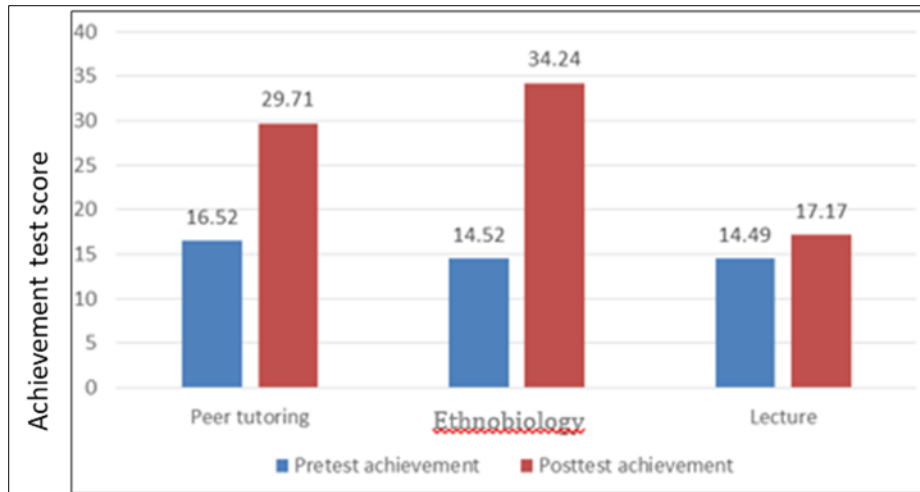


Figure 1 Mean scores of achievement of peer tutoring, Ethnobiology-based instruction and lecture

Table 2 Mean and SD showing the difference in achievement of students taught using ethnobiology-based instruction, peer tutoring and lecture method

Dependent Variable: Posttest			
Method	Mean	Std. Deviation	N
Peer tutoring	29.71	5.40	101
Ethnobiology	34.24	5.49	117
Lecture	17.17	3.66	95
Total	27.60	8.70	313

Table 2 showed that the mean of peer tutoring group is 29.71 and there were 101 students in the group. It also showed that the mean of ethnobiology-based instruction group is 34.24 with the total number of 117 students while the lecture group had the mean of 17.17 with the total number of 95 students.

Hypothesis 1: There is no statistically significant difference in achievement of students taught biology with ethnobiology based instruction, peer tutoring and lecture method.

Table 3 ANCOVA results of method on achievement showing the significant difference in achievement of students taught biology with Ethnobiology-based instruction, peer tutoring and lecture method

Tests of Between-Subjects Effects						
Dependent Variable: Posttest achievement						
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	17415.68 ^a	3	5805.23	289.44	.00	.74
Intercept	7211.47	1	7211.47	359.55	.00	.54
Pretest achievement	1469.68	1	1469.68	73.28	.00	.19
Method	15518.08	2	7759.04	386.85	.00	.72
Error	6197.60	309	20.06			
Total	26200.00	313				
Corrected Total	23613.28	312				

a. R Squared = .738 (Adjusted R Squared = .735)

The result of one-ancova analysis conducted showed that there is a significant difference in the

Methods used to teach the three groups as seen on table 3, $F(2,309) = 386.85$; $p < .05$. The significance difference was found to be in favor of the ethnobiology-based instruction (mean = 34.24). This showed that the students taught using the ethnobiology-based instruction outperformed their counterparts taught using the peer tutoring (mean 29.71) and lecture method (mean = 17.17).

3.2. Decision

The hypothesis which state that there is no statistically significant difference in achievement of students taught biology with ethnobiology-based instruction, peer tutoring and lecture method is hereby rejected since a significant difference is obtained.

3.2.1. Summary of Results

The result of one-ancova analysis conducted showed that there is a significant difference in the method used to teach the three groups as seen on table 3, [$F(2,309) = 386.85$; $p < .05$]. The significance difference was found to be in favor of the Ethnobiology-based instruction (mean = 34.24). This showed that the students taught using the Ethnobiology-based instruction outperformed their counterparts taught using the peer tutoring (mean 29.71) and lecture method (mean = 17.17). The hypothesis which state that there is no statistically significant difference in achievement of students taught biology with ethnobiology-based instruction, peer tutoring and lecture method is hereby rejected since a significant difference is obtained.

4. Discussion

The research question one which stated that will there be statistically significant difference in achievement of students taught using Ethnobiology- based instruction, peer tutoring and lecture method, revealed the results as contained in table 2 which showed that the mean of peer tutoring group is 29.71, standard deviation (5.40) and there were 101 students in the group, it also showed that the mean of Ethnobiology-based instruction group is 34.24, standard deviation 5.49 with the total number of 117 students while the lecture group had the mean of 17.17, standard deviation 3.66 with the total number of 95 students. This indicated that the achievement test of students taught using Ethnobiology-based instruction is higher than peer tutoring group and the group taught with lecture method had the lowest achievement score. This finding revealed that the interventions positively improved the academic achievements of students and the students taught using Ethnobiology-based instruction outperformed those in peer tutoring group and students in lecture group had the lowest performance in the test achievement. However the inferential analysis of hypothesis one (table 3) which sort to find out the difference in achievement of students taught biology with Ethnobiology based instruction, peer tutoring and lecture method has a significant difference on the students' academic achievement in Biology($F(2,309) = 386.85$; $p < .05$). This implies that the students taught Biology concepts outperformed and improved in their academic achievement through Ethnobiology-based instruction than their counterparts in peer tutoring and lecture method. The hypothesis which state that there will be no statistically significant difference in achievement of students taught biology with Ethnobiology-based instruction, peer tutoring and lecture method is hereby rejected since a significant difference is obtained.

The likely explanation for this outcome may be connected to the fact that Ethnobiology-based instruction helped the learners to integrate or link their cultural background of the concepts and their immediate environment with what is learnt in the classroom.

The finding of this study is in agreement with the study on the effect of Ethnobiology instruction on junior secondary school students' achievement in basic science conducted by Nwankwo (2021). The results showed that there is a significant difference in the mean achievement scores of students in the experimental and control groups in favor of the experimental group taught using ethno-science instruction. It was recommended that basic science teachers should relate learning and instruction to the students' cultural practices and other indigenous knowledge by adopting ethno-science instructional strategy. In the experimental study of Ugwuanyi (2015) on the effects of Ethnoscience based instructional model on students' academic achievement and interest of Senior Secondary Biology, the result of the study revealed that the use of Ethnoscience based instructional model was superior to lecture method . The similarities between this study and other studies showed that Ethnobiology-Based Instruction promote adequate understanding of the content in variation and evolution, thus academic achievements is enhanced and improved.

However, in a similar study by Eko Risdianto et al (2020) which aimed at discovering the effect of critical thinking skills after the Ethno science-based Direct Instruction learning model was implemented in physics learning is also in

agreement with this study. The post-test average score of experiment class using the Ethno science-based Direct Instruction learning model and the post-test score of control class using the conventional model showed that there was a significant difference. This paper concluded that the students' critical skill raised effectively when using Ethno science-based Direct Instructional Learning Model especially for Physics Learning and the paper suggests not to use conventional model.

In another study by Derlina (2019) on the improvement of students' generic science skills through ethnophysic based on Javanese culture agrees with this study. The results of research gotten from the study are: Ethnophysic application in a learning based on Javanese culture can increase the participants' generic science skills with the average category and it can develop the collaboration skill, communication, criticism and reflective, self-confident, argumentation, and creativity.

The study on the effect of Ethnoscience on American Indian students was conducted by Albert (1975), this study determined whether the use of Ethnoscience in Science concepts development will increase achievements of Navajo students at Many Farm High School and the findings of the analysis of the hypothesis was that the mean of the achievement scores of the students taught with Ethnoscience strategy which was measured by the examinations constructed by the teacher was greater which also corroborate with the findings of this study. However, an attitude survey of the students' toward science was administered to determine if Ethnoscience topics and material might have a negative effect on attitude. But the result indicated a positive attitude toward science and the hypothesis was rejected.

Another study was by Aboniyi (1999) who worked on effect of Ethnoscience based instructional model on students' conception of scientific phenomena and interest, which was conducted in Nsukka Education zone Enugu State supports the findings of this study. This study revealed that ethnoscience based model was superior to the conventional model in increasing interest in science.

Similarly the study by Ajayi et al (2017) investigated the effect of Ethnochemistry teaching approach on achievement and retention of senior secondary students in standard mixture separation techniques. The study revealed that students taught mixture separation techniques using Ethnochemistry approach had significantly higher mean achievement scores than those taught using discussion method [$F(1,197)=405.07, P<0.05$] which agreed with this study. However, students taught standard mixture separation techniques using Ethnochemistry approach had significantly higher mean retention scores than those taught using discussion method [$F(1,197)=293.00, P<0.05$].

More so, the study on effectiveness of peer tutoring on academic performance by Topping (2015), suggested that when peer tutoring was implemented with thoughtfulness about what form of organization best fits the target purpose context and population, and with reasonably high implantation integrity results are typically very good. The study of Chinemeze et al. (2022) investigated the effect of peer tutoring on mathematics achievement of senior secondary school students in Owerri Municipal council of Imo State and concluded among others that peer tutoring is more effective strategy that can be used to enhance academic achievement of students in mathematics.

Longjohn & Osila (2022) investigated effect of peer-tutoring on senior secondary school students' academic performance in mathematics in Ahoada East Local Government Area of Rivers State. The result of the findings revealed that students taught Mathematics using Peer Tutoring Strategy performed better than those taught using Conventional Teaching Method. It is therefore recommended that peer tutoring strategy be incorporated in the teaching

The study by Jibrin & Zayum (2012) investigated the effect of peer tutoring instructional method on the academic achievement in Biology among secondary school students in Zaria Metropolis, Nigeria. The results indicated that students taught biology using peer tutoring instructional method achieved higher than those taught using expository method. It is very necessary for teachers to diversify their method of teaching biology such as peer tutoring as it will assist in higher academic achievement of learners.

4.1. Qualitative Aspect

The semi structured interview for this study showed that the students like biology and the concept variation and evolution but only one student did not like evolution. The responses of the students showed that the students like the new strategies employed by their teachers relating to their cultural views about variation and evolution while the students that are taught with peer tutoring preferred their classmates peers to continue teaching because, the biology lesson made them feel relaxed and related their views and areas they did not understand to their friends for more explanation.

4.2. Triangulation of Qualitative and Quantitative Findings

The findings of the qualitative research supports the quantitative results since both of them enhances the academic achievement of students, the students exposed to the treatments outperformed the students taught using lecture method. The semi-structured interview responses from students indicated their likeness for the two intervention applied in the study that is: Ethnobiology-Based Instruction and Peer Tutoring. The students responded that they had better understanding of the concepts of variation and evolution.

The study contributes to knowledge in the following ways;

- The study has provided an avenue that could encourage the linking of cultural views and knowledge into the teaching and learning of Biology/Biological concepts.
- The study has provided evidence to the importance of cooperative learning among students by applying peer tutoring in the teaching of Biological concepts.

Recommendations

Based on the findings of this study, the following recommendations were made;

- Ethnobiology-Based Instruction should be adopted in the teaching of Biological concept in Senior Secondary Schools.
- Peer tutoring which is a strategy that is student centered which allows students to be involved in their own learning should be enforced in Senior Secondary Schools.

The academic community may need to further their studies on;

- The preponderance of indigenous students in rural schools compared to their level of presence in urban schools.

5. Conclusion

This study has provided an evidence that biological concepts was made easy to understand by the introduction of the ethnobiology-based instruction and peer tutoring in the teaching of biology. Since the achievement test in biology is improved, therefore it is of the opinion that the importance of Biology for national development can be achieved.

Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

There was no conflict of interest among the authors.

Statement of ethical approval

Ethical consent was received from the Ministry of Education Oke Mosan Abeokuta Ogun state Southwest Nigeria in charge of senior secondary school before proceeding to the schools for conduct of this study.

Statement of informed consent

The researchers received permission from the Ministry of Education to conduct the study and the interview of students was conducted with the consent of the selected students and the school authority.

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