



Effect of collaborative instructional strategy on interest of senior secondary students in biology in Otukpo lga of Benue State, Nigeria

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Abstract

This study investigated the Effect of Collaborative Instructional Strategy on Interest of Senior Secondary Students in Biology in Otukpo Local Government Area of Benue State, Nigeria. The study has two research objectives, two research questions were raised and answered and two hypotheses were tested at a 0.05 level of Significance. A quasi-experimental design was adopted. Biology Interest Inventory (BII) instruments was developed and administered to 425 samples from the population of 1484 Senior Secondary School (SSI) students in Otukpo Local Government Area, Benue State. A purposive sampling technique was used in the selection of the samples. The Biology Interest Inventory (BII) was validated by three experts. The reliability of the BII was 0.81. The experimental group was taught using the Collaborative instructional strategy while the control group was taught using the conventional Teaching method. Research questions were answered using mean and standard deviation, while hypotheses were tested at 0.05 level of significance using ANCOVA. Results revealed significant differences in interest of students taught using the Collaborative instructional strategy and their counterparts taught using the traditional Teaching method. The study further revealed no statistically significant differences in the interest of male and female students exposed to the Collaborative instructional strategy. Based on the findings, the study concluded that the Collaborative instructional strategy is effective and gender friendly and it was recommended for adoption in the teaching and learning of sciences, particularly Biology.

Keywords: Collaborative, instructional strategy, interest, senior secondary students, biology

Introduction

A teaching technique is a tool used to successfully provide instruction to participants. It is made up of the ideas and methods of education. Class involvement, demonstration, recital, memory, case study, presentations, or a mix of these are common teaching approaches. According to Meghana (2023), traditional teaching methods are employed in Nigeria's educational institutions. In this observation, teachers demonstrate the concept of the lesson using chalk and a chalkboard or by using assistive materials such as lessons printed on paper, PowerPoint presentations, case studies, debates, field visits, and practical sessions. Teaching methods are categorized into two approaches: teacher-centered and student-centered approaches. According to Ibok and Ntibi (2021)^[36], the teacher-centered approaches include lecture, expository, demonstration, and discussion, among others. In teacher-centered approaches, the teacher is seen as the only possessor of knowledge and is grounded in behaviorism. On the other hand, student-centered approaches are grounded in constructivism, and students are always active when such methods are used. These instructional methods (student-centered) underscore teachers not as decision makers and problem solvers but rather as guides in the learning process. Examples of student-centered learning approaches include inquiry-based learning, the discovery method, and the laboratory method (virtual and physical laboratories), among others.

The traditional method of learning, called the teacher-centered method, is gradually becoming irrelevant and does not seem to satisfy or meet the current needs of society. This approach of teaching only provides theoretical knowledge, which is irrelevant to students and the society in which they

live (Raza *et al.* 2022)^[12]. There are new strategies or trends of learning that make efforts to introduce new methods or evolve new techniques of instruction that facilitate positive learning outcomes in education. To understand this study, the focus has to shift from the traditional teacher-centered learning approach to modern classroom techniques-based approaches to learning by adopting new trends and techniques of teaching so that we can produce more intellectual researchers and scientists who would contribute to the process of resolving environmental issues and help to save our earth and society (Raza *et al.* 2022).

Given the importance of science to the nation, the science education curriculum has been developed at various levels of education in Nigeria. The e-Curriculum of the National Educational Research and Development Council (NERDC) (2024)^[14] stated that Science Education curricula at the Basic Education Level include Basic Science and Technology at lower and Middle Basic Education levels (primaries 1-6) and Basic Science at Upper Basic Education level (Junior Secondary JS1-3). At the Senior Secondary School Level, Science Education includes: Biology, Chemistry, and Physics, while at the tertiary education level, the contents of the curricula of Science Education include Chemistry Education, Integrated Science Education, Physics Education, and Biology Education, among others.

Biology, as a subject taught in senior secondary school, according to Onu, Anyaegbumam and Uzoigwe (2020)^[30], is defined as a natural science that studies the existence (evolution, morphology, and physiology) of living things, as well as their interactions with non-living components of the earth. Hence, it is a branch of science that studies living things and their interactions with their natural environment.

plays an important role in transforming the environment and improving the general quality of life. Nwuba, Egwu, and Osafor (2022) ^[15] stressed that the importance of Biology cannot be overemphasized, as it provides the knowledge applied in every sphere of life today, ranging from food production, environmental protection, conservation of resources, bioengineering, and agriculture. Biology as a science subject plays an important role in transforming the environment and improving the general quality of life. Recent studies emphasize that Biology occupies a central position in modern education and national development. With adequate knowledge of Biology at the secondary school level, students are better prepared to pursue professional courses such as Nursing, Pharmacy, Medicine, Dietetics, and Geology in higher institutions. This underscores the need for effective and efficient teaching and learning of Biology in Nigerian secondary schools (Saadu *et al.*, 2024) ^[32].

Recent studies indicate that one of the strongest factors influencing students' interest in science, particularly Biology, is the method of instruction adopted by the teacher, which significantly shapes students' perception of the relevance of the subject to their future careers (Okereke & Ikoroha, 2024) ^[26]. Furthermore, research has shown that students' negative perception of science is often linked to inappropriate or teacher-centered instructional methods, which limit engagement and meaningful understanding (Twizeyimana *et al.*, 2024).

Teaching methods are ways through which teachers organize and present content and learning. However, despite the importance of science to society, it is quite disheartening to note that there is strong evidence of students' low interest in Biology and other science subjects in Nigeria (Aina & Adedjoja, 2021; Yusuf & Bello, 2022) ^[2, 37]. In Nigeria, for instance, quite some students who get to senior secondary school drop out of science classes, a trend often described as a swing away from science and unimpressive enrollment in science-related subjects (Ogunleye & Babajide, 2021) ^[20]. There has been persistent poor performance among Biology students and science in general, leading to low interest in the sciences, particularly Biology. Reports from the West African Examinations Council (2017–2021) ^[11, 19] have continued to highlight students' weak performance in Biology and other science subjects in Senior Secondary School Certificate Examinations.

Recent studies further reveal that low interest in science and Biology are largely linked to inappropriate and uninspiring traditional teaching approaches, especially during and after the COVID-19 period (Eze & Chukwu, 2023; Ibrahim *et al.*, 2022) ^[3, 9]. It has been noted that many teachers still shy away from activity-oriented and student-centered teaching strategies, relying instead on conventional methods that are often inadequate for meaningful learning (Okeke & Ibrahim, 2023) ^[23]. In addition, factors such as overcrowded classrooms, lack of adequate instructional materials (including indigenous textbooks), insufficient funding, low teacher motivation, and weak monitoring and feedback systems have significantly contributed to poor student outcomes in Biology in Nigeria and Benue State in particular (Olatunde & Nwosu, 2021; Adeyemi, 2022) ^[1, 28]. Biology as a subject is very complex and covers a wide range of knowledge, and several reviewed literature pieces on its studies come with students' misconceptions as well as their difficulties as they learn (Skamp, 2018) ^[18]. There is

every need for science (Biology) teachers to make the learning environment conducive to motivating students to study Biology, thereby enhancing their interest. Most teachers of Biology at the senior secondary school level are inexperienced and, in some cases, not adequately qualified (Adamu & Olatunji, 2022) ^[21]. Most of the teachers teach Biology without taking students to the laboratory for practicals, so they can have a better understanding based on what is taught in the class. As a result of this, students tend to achieve and retain very little in Biology. A qualified science teacher possesses appropriate professional teaching credentials such as the Nigerian Certificate in Education (N.C.E), Postgraduate Diploma in Education (PGDE), or a Bachelor of Science degree in Education (B.Sc. (Ed)). Such qualified and well-experienced science teachers are better positioned to adopt innovative teaching approaches in science teaching, particularly in Biology (Ogunode and Adamu, 2022) ^[21].

Interest simply entails the willingness to acquire skills, knowledge, attitude, and values. It is the eagerness of the learner to learn a set-out task or activity for positive and near mastery of the skills and knowledge related to the activity (Nwachukwu and Okoli, 2020) ^[17]. Similarly, Okekeokosisi & Okigbo (2021) ^[24] defined interest as an emotionally oriented behavioral trait that determines a student's urge and vigor to tackle educational programs or other activities. Hence, interest, in the context of this study, may be defined as a personal attribute of a student towards a learning situation, usually expressed as a like or dislike. From the foregoing definitions, it can be deduced that interest is an important factor that needs to be considered for effective learning to take place. Similarly, Udoh (2019) ^[35] stated that meaningful learning depends on interest and how motivated learners are during the teaching and learning process; that is, when students feel passionate about a lesson's content and its method of instruction, the students' interest is aroused, and this makes learning permanent as well as fosters interest.

The interest of students in Biology in senior secondary schools in Nigeria are poor, and this has been a persistent problem for many years. This could be attributed to the use of conventional teaching methods where the teacher employs the "chalk and talk" approach, without significant participation of students, making rote learning the order of the day (Ojekwe & Ogunleye 2020; Ogbomanu & Akporekwe, 2018). According to Ogunleye (2021) ^[18, 19, 22], there has been a gradual paradigm shift towards the adoption of innovative teaching and learning strategies where the students (both male and female) are expected to be active participants in the teaching-learning process. Research in Science Education has shown that both the feminist empiricist and the liberal feminist critics seem to agree that female students' participation in sciences will produce exact results as their male counterparts when both are taught using the same teaching method (Howes, 2017) ^[11]. Both male and female senior secondary school Biology students will have a similar level of interest when taught science using the collaborative instructional method. Gender, as a concept, has captured the interest of science educators in Nigeria, especially now that gender equity is being emphasized in many quotas. According to Filgona and Sababa (2017) ^[6], gender is defined as a range of physical, biological, mental, and behavioral characteristics pertaining to, and differentiating between, the feminine and masculine (female and male) population.

Hence, gender in the context of this study may simply be defined as an attribute ascribed to male and female students based on biological features. In recent times, gender-related issues in science education have generated serious concerns for science educators, judging by the number of studies done on this effect. However, there is no consensus as to whether it affects students' interest in science or not.

While some researchers (Onu, Anyaegbumam & Uzoigwe, 2020; Usang & Okoli, 2021) ^[30, 36] reported that female students had higher interest in Biology and chemistry than their male counterparts, others (Okekeokosisi & Okigbo, 2021) ^[24] reported that there is no significant difference in the mean interest scores of male and female students in science subjects. These inconclusive results on gender call for further investigation to find out if gender influences students' interest in Biology or not. Hence, this study also intends to examine gender differences in interest among secondary school students taught Biology using collaborative instructional strategies.

Statement of the Problem

Biology, as a science subject, deals basically with man's interactions with his immediate and natural environment. Students need to work together through collaboration to understand the various entry-level knowledge brought into the classroom by others to foster creative ideas, critical thinking, and problem-solving skills, which will lead to specialization in the various aspects of Biology that make the learners useful to their society and the world at large.

Research reports showed that teachers' inability to use innovative or student-centered approaches or strategies, such as collaborative instructional strategy, and guided inquiry teaching approach, is the major cause of low interest of senior secondary school students in Biology. This low interest in Biology implies that only a few candidates will apply to study Biology and related courses in a tertiary institution. This study, therefore, sought to find out the effect of collaborative instructional strategy on interest of Senior Secondary Students in Biology in Otukpo Local Government Area of Benue State, Nigeria.

Objectives of the Study

The objective of this study was to determine the effect of collaborative instructional strategy on the interest of senior secondary students in Biology in Otukpo Local Government Area of Benue State. Specifically, the study sought to;

- i. ascertain the mean interest ratings of students taught Biology using a collaborative learning strategy and those taught using a conventional teaching strategy.
- ii. ascertain the difference in mean interest ratings of male and female students taught Biology using a collaborative instructional strategy.

Research Questions

The following questions were raised to guide this study.

1. What are the mean interest ratings of students taught Biology using a collaborative learning strategy and those taught using a conventional teaching strategy?
2. What is the difference in the mean interest ratings of male and female students taught Biology using a collaborative instructional strategy?

Hypotheses

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

1. There is no significant difference in the mean interest ratings of students taught Biology using a collaborative learning strategy and those taught using a conventional teaching strategy.
2. There is no significant difference in the mean interest ratings of male and female students taught Biology using a collaborative learning strategy.

Significance of the Study

The findings of this research work would immensely benefit Biology teachers, science curriculum planners and developers, science students, science educators, school administrators, other researchers, and the Federal and State Ministries of Education. The findings of this study would also help Biology teachers acquire the requisite skills for using a collaborative learning strategy that encourages students' active participation and arouses and sustains their interest by making learning concrete and permanent.

The findings of this research work would also help students to acquire the requisite knowledge and skills that can integrate the cognitive, affective, and psychomotor skills for meaningful learning to take place. It would also help the students learn how to work with others. It would help them learn to share responsibilities for acquiring new knowledge and understanding with peers and value new experiences as an opportunity for inquiry and learning.

Scope of the Study

This study is restricted to Senior Secondary One (SS1) Students of Biology in Otukpo Local Government Area of Benue State, Nigeria. The choice of SS1 is because it is the foundation class of senior secondary education, where students are expected to choose subjects and their interests matter. Students in this class are just being introduced to Biology as a subject and need to have a clear understanding of the new concepts in the curriculum, which will form the basis for their preparation for external Biology examinations. Therefore, they need to have a clear understanding of the Biology curriculum and its contents through a collaborative teaching strategy. The content coverage of the study is Ecology, Photosynthesis, and Animal nutrition, which are topics to be taught in Biology.

Methodology

The research design that was used for this study is a Quasi-experimental design of non-equivalent groups. Specifically, a non-randomized, pretest-posttest control group. This design was adopted and considered appropriate for the study because the intact class was used for the study. Egbe (2016) ^[4] observed that this research design is appropriate for use where intact classes was used for the study. The researcher considers the design appropriate for the study and also adopted it because the researcher could not have a complete randomization of the subjects, as this would have disrupted the normal classroom organization. Both experimental and control groups were given the same pretest before treatment and post-test after the treatment.

The area of study is the Otukpo Local Government Area of Benue State. Otukpo Local Government Area is one of the Twenty-three (23) Local Government Areas of Benue State. The population of the study is 1484 Senior Secondary (SS1) Biology students from the Secondary Schools in Otukpo Local Government Area of Benue State that offer Biology (Benue State Teaching Service Board, 2023) ^[3]. The sample

size of this study consisted of 425 Biology students drawn from four government secondary schools in Otukpo Local Government Area of Benue State. The sample size was determined using Yaro Yamane's formula. A multi-stage sampling technique was adopted for the selection of the sample.

One instrument was used for data collection. The instrument was the Biology Interest Inventory (BII). The researcher adopted this instrument from Kollar, Baunert, and Schabel (2001) with items of interest scale that respond on a continuum of strongly agree, agree, disagree, and strongly disagree to suit the study. For BII, the options are scored using a four-point rating scale of Strongly Agree (SA-4), Agree (A-3), Disagreed (D-2) Strongly Disagreed (SD-1) A total of 20 items on Biology Interest were developed, and the students were asked to tick the most appropriate options.

Validation of Instruments: The Biology Interest Inventory (BII) were given for face and content validation to three experts. One expert in Test and Measurement from the Department of Guidance and Counselling, Joseph Sarwuam Tarka University, Makurdi, another from Nassarawa State University, Keffi, and one experienced Biology teacher from Saint Annes Secondary School, Otukpo. The experts were requested to observe or validate the instrument on content coverage, clarity, simplicity, the language of items, appropriateness of the items constructed, and the structure of questions concerning the stated objectives of the study. The experts who validated the instruments made constructive criticisms, observations, and suggestions, which were addressed accordingly.

Reliability of Instruments: For reliability of the instrument, the Biology Interest Inventory (BII) was trial-tested using students of St Paul's Secondary School, Otukpo. This set of students was considered to be most appropriate for a trial-test study because they possess similar characteristics to those that were used for the study. After the administration of (BII) the reliability of the BII was determined using Cronbach's Alpha because the items were arranged on a continuum of 4,3,2,1. The reliability of the instrument (BII) was then found to be 0.81. This value implies that the instrument was reliable.

Method of Data Collection: The data were collected through face-to-face administration of BII. The researcher had a face-to-face meeting with the teachers assigned to the experimental group and had an interaction about what was expected from them. Two teachers for the experimental group were given the lesson plan for the topics to be taught and instructed to use a collaborative instructional strategy in giving the experience to the students, while the other two teachers for the control group were also given the lesson plan for the topics to be taught and instructed to use their usual conventional strategy of teaching for the lesson.

Data were collected and analyzed using mean, standard deviation and ANCOVA. The research questions were answered using the descriptive statistic of mean and standard deviation, while the hypotheses were tested using the ANCOVA at 0.05 level of significance.

Data Presentation, Analysis and Interpretation

The result of the data analysis and interpretation are presented according to research questions and hypotheses formulated for the study.

Research Question 1: What are the mean interest ratings of students taught Biology using a collaborative instructional strategy and those taught using a conventional teaching strategy?

To answer this research question, the interest ratings of students are presented in Table 1.

Table 1: Mean and Standard Deviation of the Mean Interest Ratings of Students in the Experimental Groups and Control Groups.

Groups	N	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Mean Gain
Experimental	212	1.65	0.63	3.61	0.49	1.96
Control	213	1.52	0.58	1.92	0.57	0.40
Mean Difference	—	0.13	—	1.69	—	1.56
Total	425	—	—	—	—	—

Table 1 shows that, before treatment, the experimental groups had a mean interest rating of 1.65 with a standard deviation of 0.63, while the control groups had a mean interest rating of 1.52 with a standard deviation of 0.58.

The Table also shows that after treatment, the experimental group had a mean interest rating of 3.61 with a standard deviation of 0.49, while the control groups had a mean interest rating of 1.92 with a standard deviation of 0.57. From the pre-test and post-interest ratings, the mean gain for the experimental groups was found to be 1.96, while the mean gain for the control groups was 0.40. The mean difference between the mean interest gain ratings of the experimental and control groups was 1.56. This shows that the experimental groups improved more in their interest ratings when compared to the control groups.

Research Question 2: What is the difference in mean interest ratings of male and female students taught Biology using a collaborative instructional strategy?

To answer this research question, the interest ratings of students are presented in Table 2.

Table 2: Mean Interest Ratings and Standard Deviation of Male and Female Students in Experimental Groups and Control Groups.

Gender	N	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Mean Gain
Male	103	1.62	0.64	3.64	0.50	1.86
Female	109	1.67	0.62	3.73	0.44	2.06
Mean Difference	—	-0.05	—	-0.09	—	-0.20
Total	212	—	—	—	—	—

Table 2: Shows that before the treatment was carried out, the males had mean interest ratings of 1.62 with a standard deviation of 0.64, while the females had a Mean interest rating of 1.67 with a standard deviation of 0.62. The Table also shows that after the treatment was administered, the males had a mean interest rating of 3.64 with a standard deviation of 0.50, while the females had a mean interest rating of 3.73 with a standard deviation of 0.44. From the pre-test and post-test ratings, the mean interest gain for the males was found to be 1.86, while the mean interest gain for the females was 2.06. The mean difference between the interest gain ratings of males and females was -0.20. This shows that the females gained slightly higher interest ratings compared with the males.

Hypothesis 1: There is no significant difference in mean interest ratings of students taught Biology using a collaborative instructional strategy (experimental groups) and those taught using the conventional teaching strategy (control groups).

The result of this hypothesis is presented in Table 5.

Table 3: Summary of Analysis of Covariance (ANCOVA) of Experimental Groups and Control Groups. Interest Ratings in Biology.

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	301.492 ^a	2	150.746	534.672	.000
Intercept	437.466	1	437.566	1551.980	.000
Post-test	324	1	324	1.149	.284
Group	299.842	1	299.842	1063.492	.000
Error	118.979	422	.282	—	—
Total	3669.000	425	—	—	—
Corrected Total	420.471	424	—	—	—

Table 3 shows the ANCOVA analysis of the interest ratings of students taught Biology using a collaborative instructional strategy (experimental groups) and those taught using a conventional teaching strategy (control groups). From the Table, it can be observed that the significant value of 0.000 is less than the set alpha value of 0.05 at 1 degree of freedom. This implies that the test is significant. This means that there is a statistically significant difference in mean interest ratings between students taught Biology using a collaborative instructional strategy and those taught using conventional teaching strategies. This further indicates that there was a higher improvement in the mean interest ratings of students in the experimental group than in the control group. Hence, the null hypothesis was rejected

Hypothesis 2: There is no significant difference in mean interest ratings of male and female students taught Biology using a collaborative learning strategy.

The result of this hypothesis is presented in Table 6

Table 4: Summary of Analysis of Covariance (ANCOVA) of the Interest Ratings of Male and Female Students in the Experimental Group and Control Groups in Biology

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3.639 ^a	2	1.820	8.115	.000
Intercept	437.466	1	437.566	1625.630	.000
Post-test	.108	1	.108	.484	.488
Gender	3.573	1	3.573	15.936	.000
Error	46.865	209	.224	—	—
Total	2811.000	212	—	—	—
Corrected Total	50.505	211	—	—	—

Table 4 shows the ANCOVA analysis of the interest ratings of male and female students taught Biology using a collaborative instructional strategy. From the Table, it can be observed that the significant value of 0.000 is less than the set alpha value of 0.05 at 1 degree of freedom. This implies that the test is significant. This indicates that there is a statistically significant difference in mean interest ratings of male and female students taught Biology using a collaborative learning strategy. Hence, the null hypothesis was rejected.

Summary of Major Findings

Based on the analysis of data from the study, the following major findings were made from the study

1. Students in the experimental group who were taught Biology using a collaborative instructional strategy recorded higher improvement in their interest compared to their counterparts in the control group. This was statistically significant.

2. Male and female students taught Biology using a Collaborative instructional strategy differed in improvements in their interest rates. There was a statistically significant difference in their interest ratings, as female students recorded a higher interest rating than their male counterparts.

Discussion of Findings

Analysis of data in Table 1 shows that students in the experimental group improved in their interest ratings more than the students in the control group. From the test of hypothesis results in Table 5, the p-value of 0.00 showed that there was a statistically significant difference in the mean interest ratings of experimental and control groups in Biology. These results presented in this study are in line with those of Victor (2024) ^[14], who found in his study that using a collaborative learning strategy resulted in improved interest and academic achievement. This improvement in interest in Biology after the collaborative instructional process may be a result of the excitement that comes with working together as a group and the fulfillment of achieving the desired goal Victor, 2024) ^[14]. Students find it interesting when they are active participants in a group with a specific focus. This is therefore evident from the results arrived at in this study, which confirms that using a collaborative instructional strategy while teaching Biology led to an improvement in students' interest in the subject.

The data analysis in Table 1 reveals a notable increase in interest ratings among students in the experimental group compared to the control group. The hypothesis test results in Table 5 (p-value = 0.00) confirm a statistically significant difference in mean interest ratings between the two groups, favoring the experimental group. These results align with the study conducted by Najmonisa and Saad (2017) ^[11], who found in their study that the use of a collaborative instructional strategy improved the interest of students, suggesting that the collaborative instructional strategy had a positive effect on students' interest in Biology

Analysis of data in Table 2 shows that students in the experimental group improved in their interest ratings more than the students in the control group. From the test of hypothesis results in Table 6, the p-value of 0.00 showed that there was a statistically significant difference in the mean interest ratings of experimental and control groups in Biology. These results presented in this study are also in line with the study of Abubakar and Muhammad (2024) ^[14], who found in their study that using a collaborative learning strategy resulted in improvement in the academic achievement of students. This improvement in the academic achievement of students in Biology after the collaborative instructional strategy was used may be a result of the excitement that comes with working together as a group and the fulfillment of achieving the desired goal. Students find it interesting when they are active participants in a group with a specific focus. This is therefore evident from the results

arrived at in this study, which confirms that using a collaborative instructional strategy while teaching Biology led to an improvement in students' academic achievement.

In terms of gender, interest ratings of male and female students differed to an extent after being taught Biology using a collaborative instructional strategy. This was further confirmed by the test of analysis in Table 4, which shows a p-value of 0.04 ($p < 0.05$) and confirms that the difference in the mean interest ratings of male and female students taught Biology using a collaborative learning strategy was statistically significant. The results presented in this study are in line with the findings of Ude and Ezugwu (2023) and Warsah *et al.* (2021)^[19], who also found that the adoption of a collaborative instructional strategy in the classroom resulted in improved students' interest and critical thinking in the sciences. According to them, when students learn collaboratively, they discuss among themselves and learn from each other, which, to the students, is more fun than learning from their teacher. Also, the slow learners are well catered for through this learning process, such that they are allowed to learn at their own pace through interaction with their fellow students, which also serves as a source of challenge to them. With these, their interests are aroused in the subject, and they realize they can also perform well in it. This is also evident from the results arrived at in this present study, which confirms that using a collaborative instructional strategy while teaching Biology led to an improvement in interest and academic achievement of male and female students in the subject

Conclusion

Conclusively, this study found that the collaborative instructional strategy promotes higher interest of secondary school students in Biology as compared to the conventional teaching strategy. While using this strategy, there were no significant differences in the Students interest in Biology due to the gender of secondary school students, and therefore, the strategy is deemed effective and appropriate for both male and female students.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. Biology teachers should be encouraged to use collaborative instructional strategies in presenting some Biology concepts to students to enhance their interest in Biology and other science-related subjects.
2. Collaborative instructional strategy should be adopted as a learning strategy for Biology in secondary schools to improve and sustain students' interest in the subject, which consequently leads to improvement in their in the subject and other areas of science.
3. Stakeholders such as the Science Teachers Association of Nigeria (STAN) should popularize this strategy through workshops and conferences.
4. In-service training should be given to Biology teachers on the application of the collaborative instructional strategy as a strategy by which students can learn Biology effectively.
5. If the total overhauling of traditional instructional strategies to adopt innovative methods, such as collaborative strategy, in the teaching and learning of science, particularly Biology, is to be considered, then the time and periods allocated for each learning

experience should also be looked into by all stakeholders of education to successfully achieve the objectives of the lessons

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