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# ADOPTING QUESTIONING INSTRUCTIONAL STRATEGY IN BIOLOGY CURRICULUM DELIVERY TO ENHANCE STUDENTS' ACHIEVEMENT AND INTEREST IN DELTA CENTRAL SENATORIAL DISTRICT

**BY**

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## ABSTRACT

*This study examined the use of questioning instructional strategy in biology curriculum delivery on students' academic achievement and interest in Delta Central Senatorial District of Delta state. The study was guided by four research questions and hypotheses. The research design was a quasi-experimental design. The population of the study consists of 21, 147 SS II biology students. The sample of the study consists of 296 SS2 students from four secondary schools in Delta Central Senatorial District. In order to collect data, the Biology Achievement Test (BAT) and the Students Interest Inventory in Biology (SIIB) were used. The reliability index of the BAT and SIIB were calculated using the Kuder-Richardson (KR) formula -21 and Cronbach Alpha which yield a reliability coefficient of 0.81 and 0.84 respectively. Data for the study was collected by administering the instruments as pretest and posttest to the students. Data was analyzed using Means, Standard deviations, t-test, Analysis of Variance (ANOVA). Findings indicate that: there is a significant difference in mean achievement score of Biology students taught using questioning and conventional lecturing instructional strategies; there is a significant difference in mean interest score of Biology students taught using questioning and conventional instructional strategies; there is no significant difference between the mean achievement scores of male and female students taught Biology using the questioning instructional strategy; There is no significant difference between the mean interest scores of male and female students taught Biology using the questioning instructional strategy. As a result of the findings, it was recommended, among other recommendations, that Biology teachers should incorporate the questioning instructional strategy into their teaching of Biology curriculum concepts.*

**Keywords:** Curriculum, Biology, Achievement, Interest



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## Introduction

Biology is a branch of science structured to equip students with the knowledge of relevant concepts and scientific skills. Biology allows students to interact with a broad variety of living species as well as their local and wider surroundings. It teaches students how to understand their own bodies and the changes they go through. Biology ties us to the planet we live on and reminds us of our interdependence with all other living things. It raises awareness of the importance of Nigeria's unique ecosystems. It allows students to understand the processes that all living things go through. Students who study biology are more aware of both their own health and significant biological issues including the usage of antibiotics, genetically modified foods, and eradicating invasive species. In biology class, students learn why agriculture and gardening are important in Nigeria and how they can help the country's future. Students who study biology are much more aware of ecological issues and are better able to discuss situations where environmental exploitation, such as for mining, farming, or energy production, conflicts with conservation objectives or where more environmentally friendly ways of using natural resources, such as soil, land, or water, are necessary.

The study of biology also enables Biology graduates to work as an agronomist, animal behavior scientist, animal welfare officer, biochemist, biotechnologist, cheese production supervisor, conservation biologist, environmental analyst, environmental ecologist, environmental manager, environmental officer, fisheries scientist, food and drink technologist, forestry technician, genetics technician, marine biologist, meat biochemist, medical sciences technologist, and medical sciences technologist. Learning biology will give students an appropriate and applicable biology knowledge and scientific knowledge that can be used in health, agriculture, and personal and community daily life (FRN, 2013). It will also help them develop functional scientific attitudes and interest. The biology curriculum place emphasis in field studies, guided discovery, laboratory techniques, and skill acquisition the cardinal point of which is to prepare students to attain sufficient skills, knowledge relevant in ability, ability to apply scientific knowledge to life (FRN, 2013). However, though students find biology interesting and register it in large number at the senior secondary school level, performance remain poor (Oyovwi, 2021).

According to Oyovwi (2020), when curriculum concepts are not meaningfully understood by students, the tendencies to tackle questions is slim and this lead to poor performance. In Nigeria, there is clear evidence of under achievement in Biology by the students at the senior secondary school certificate examinations. This implies that most students at completion of their secondary school Biology courses fail to attain the pass grades (Oyovwi, 2021). The problem of low academic achievement in Biology is evidenced by the large number of secondary school students who failed to obtain at least a credit pass in Biology in WAEC year in year out. This gloomy condition has prompted research initiatives over the years aimed at determining the elements that contribute to low academic achievement in biology and what steps may be taken to ameliorate the situation. According to Adesehinwa and Aremu (2012), several variables interact to determine students' academic achievement. However, the researcher believed that instructional strategies could be one of the factors affecting students' academic achievement and interest in Biology.

Many instructional strategies have been developed and tested over the years while many have been deemed inappropriate for secondary school teaching and learning. The skill students learn and how well they do in Biology have been linked to the ways teachers teach the subject.Studies on instructional methods and their effects on students' academic achievement have indicated that the conventional lecture method is still the most prevalent instructional strategy that most teachers often use in implementing the school curriculum in

secondary schools. Oyovwi (2021) clearly stated that if learning strategies and students' achievement have to improve, then the students have to be introduced to more innovative and teaching strategies such as questioning, concept-mapping, guided discovery, cooperative learning among others.

Questioning is one of the primary and most influential teaching methods and skills that teachers uses (Cotton, 2014). Studies showed that questioning strategy is an indispensable part of classroom interaction (Edwards & Bowman, 2016). Questioning instructional strategy is an instructional strategy where teacher employ series of question to explore an issue, an idea or something intriguing. Questioning is the process of forming and wielding that serves to develop answers and insight. According to Arslan (2016), asking questions is a key instructional method since they operate as motivational stimuli and have arousal and association effects. The use of open-ended questions allows students to freely express their ideas while also allowing the teacher to keep them actively engaged in the lecture.

Teacher questioning, according to Aagard (2003), is a crucial component of classroom teaching and learning and the only quick way to determine what students know and are learning. The use of a questioning instructional technique allows the teacher to keep track of and modify the communication patterns in the classroom in order to foster an atmosphere that is favourable for both classroom learning and knowledge acquisition (Etaneki, 2021). Questioning instructional strategy has been shown to be an important and integral part of learning, and questions asked by teachers can become indices of quality teaching. Through the use Questioning instructional strategy, teachers elicit students' explanations, elaborations of previous answers and ideas, and predictions that contradict students' intuitive ideas about natural phenomena. Itenables teacher to provoke students thought and creative thinking that could also lead to better academic achievement. This study therefore investigated the effects of questioning instructional strategy on students' academic achievement and interest in Biology.

The term interest is a feeling or emotion directed towards an object, event, or process. It is regarded as a broad idea that might include other, more particular psychological concepts like curiosity and, to a much lesser extent, surprise. One definition of interest is an activity one enjoys and spends time learning or doing. It may also be understood as a sensation that results from a desire to know or understand more about someone or something. Chauhan (2007) states that interest is an activity that makes someone want to act. If a learner is interested in a certain set of facts or ideas, he or she is more likely to work hard to understand them. This indicates that intense interest draws a person's attention and motivates intense effort toward a goal, which may be related to academic activities or something else (Kumar & Varma, 2018).

Academic achievement is a performance result that shows how well a person performed in relation to particular objectives that were the focus of activities in instructional environments, specifically in school (Suleman, Aslam, & Hussain, 2014). Academic achievement is defined as a certain level of competence in academic work as determined by the teachers. Academic achievement is defined as the knowledge acquired in the classroom, which is typically assessed through teacher evaluations (Bhat & Bhardwaj, 2014). One of the main factors considered while evaluating a student's progress in biology is achievement. The teacher could evaluate his teaching and methods using the students' achievement as an indicator.

The term sex refers to the biological characteristics of being a boy or a girl. Research has shown that sex as a factor could affect the academic achievement and interest of students as boys are likely to show better achievement and interest than girls in science subjects (Odagboyi, 2015). Fabunmi (2004) in a study also revealed that sex composition has a significant effect on students' academic achievement.

Given the foregoing, the role of instructional strategy in the teaching and learning process cannot be overstated. The academic achievement and interest of students in Biology can be enhanced by the instructional strategies used by teachers in presenting the content of the subject to students. Thus, this study seeks to examine the effectsof questioning instructional strategy on achievement and interest of biology students in secondary school.

## Statement of the Problem

Research shows that the teaching and learning of Biology has been plagued by problem of poor academic achievement and low interest. The problem of low academic achievement is evidenced by the large number of secondary school students who fail to obtained at least a credit passes in Biology in WAEC. The poor academic achievement may be as a result of rote learning of Biology curriculum concepts which occur due to lack of active involvement in the teaching of subject.

Thus, student's poor academic achievement and lack of interest at the secondary school has been attributed to ineffectivemethods and strategies used by teachers in teaching the subject. The available literature on methods of teaching in science education suggests the need to employ new and innovative teaching strategy such as questioning instructional strategy. The problem of the study, therefore, is will the adoption of questioning instructional strategy produce differential effect on academic achievement and interest of students in Biology?

## Research Questions

The following research questions guidedthe study

1. Is there any difference in mean achievement score of Biology students taught using questioning instructional and conventional lecturing instructional strategies?
2. Is there any difference in interest mean score of Biology students taught using questioning instructional and conventional lecturing instructional strategies?
3. Is there any difference between the mean achievement scores of male and female students taught Biology curriculum using questioning instructional?
4. Is there be any difference between the interest mean scores of male and female students taught Biology curriculum using questioning instructional strategy?

## Hypothesis

The following null hypotheses were formulated for the study and were tested at 0.05 level of significance

1. There is no significant difference in achievementmean score of Biology students taught using questioning and conventional lecturing instructional strategies.
2. There is no significant difference in interest mean score of Biology students taught questioning instructional and conventional lecturing instructional strategies.
3. There is no significant difference between the mean achievement scores of male and female students taught Biology using questioning instructional strategy.

4. There is no significant difference between the interestmean scores of male and female students taught Biology using questioning instructional strategy.

**Purpose of the Study**

The purpose of this study is to examine the effects of questioning instructional strategy on academic achievement and interest of Biology students in Delta Central Senatorial District. Specifically, the study:

I. Determined the difference in mean achievement score of Biology students taught using questioning instructional and conventional lecturing instructional strategies.
II. Find out the difference in interest mean score of Biology students taught using questioning instructional and conventional lecturing instructional strategies?
III. Ascertained the difference between the achievement mean scores of male and female students taught Biology using questioning instructional strategy.
IV. Find out the difference between the interest mean scores of male and female students taught Biology using questioning instructional strategy.

**Theoretical Framework**

This study was anchored on the constructivist learning theory propounded by Lev Vygotsky in 1978 based on the idea that learners are active participants in their learning and that knowledge is constructed based on experiences. Vygotsky's constructivism is known as social constructivism who noted that for learning to take place, the individual first establishes touch with the social environment on an interpersonal level and then internalizes these experiences. The child is influenced by prior beliefs and new experiences, which then create new concepts

Constructivism was a school of thought that held that information is created and that each student starts their educational journey with some prior knowledge before building on it. since of this, each student's knowledge will be distinct since they will choose whatever parts of the experience to add. According to the constructivist learning paradigm, acquiring knowledge is a social activity that requires interaction with others. Understanding is created through encounters, group work, discussions, and dialogues. Learning is also viewed as an active process according to constructivist learning theory. This implies that when students actively participate in conversations and activities, they build knowledge more quickly and effectively.

Constructivist learning theory is thus very relevant to this study because teachers can implement its principles to promote active participation in the learning process and give students the opportunity to build on prior knowledge, interact with one another, and construct new understandings based on the lessons taught through cooperative learning and questioning instructional strategies. The goals of questioning instructional strategy, which include the development of teamwork, critical thinking, self-resourcing, and self-reflecting, are supported by constructivist learning theory. This will help students develop the intrinsic motivation they need to succeed. Teachers will be able to direct learning by adopting group activities, encouraging collaborative dialogue, and promoting interactive experiences.

**Research Methodology**

The research design adopted the pre-test, post-test, control group quasi-experimental design using intact classes to provide stability, avoid disruption of class lesson and arrangement and the rigid school timetable which did not allowed randomization of the students.

The population of this study consists of 21, 147SS II Biology students in all the 190 government-owned secondary schools in Delta Central Senatorial District. The sample of the study consists of 296 SS2 students from four secondary schools in Delta Central Senatorial District drawn using simple random sampling method by balloting without replacement.

**Research Instruments**

Two research instrumentswereused for data collection, namely Biology Achievement Test (BAT) and Students Interest Inventory in Biology (SIIIB).

**Validation of the Instruments**

Three experts validated the Biology Achievement Test (BAT) and the Students' Interest Inventory in Biology (SIIIB) from the Department of Science Education in Delta State University, an experienced Biology teacher and from Measurement and Evaluation. The experts verify the items' appropriateness of expressional standard, language, suitability, layout, sequencing, and other factors for face validity.

**Reliability of the Instruments**

The researcher administered both the Biology Achievement Test (BAT) and Student Interest Inventory in Biology (SIIIB) to 60 SS II students from a secondary school in the Delta South Senatorial District outside sampled area in order to test its reliability using the internal consistency reliability method. The reliability index was calculated using the Kuder-Richardson formula -21 and Cronbach Alpha which yield the reliability coefficient of 0.81and 0.84 respectively

**Method of Data Analysis**

Data obtained from BAT and SIIB were analyzed using Mean Scores and Standard Deviation to answer the research questions while the hypotheses were tested with t-test statistics at 0.05 level of significance and Analysis of Covariance (ANOVA).

**PRESENTATION OF RESULTS**

**Research Question 1**

Is there any difference in achievement mean score of Biology students taughtwith questioning and conventional instructional strategies?

**Table 1: Comparison of the Mean ($\bar{x}$) Achievement Score of Biology Students taught using Questioning and Conventional Instructional Strategies**

| Instructional Strategies | N | Pretest | | Post Test | | Mean Gain |
|---|---|---|---|---|---|---|
| | | $\bar{x}$ | SD | $\bar{x}$ | SD | |
| Questioning instructional strategy | 130 | 8.22 | 1.23 | 40.61 | 8.98 | 32.39 |
| conventional instructional strategy(control) | 166 | 8.16 | 1.29 | 15.83 | 1.83 | 7.67 |
| Total | 296 | | | | | |

Table 1 revealed the mean and standard deviation of the achievement meanscore of Biology students taught using questioning, and conventional instructional strategies. In the table, the means of the pretest and posttest scores of students taught using the questioning instructional strategy are 8.22 and 40.61, with standard deviations of 1.23 and 8.98, respectively. While the means of the pretest and posttest scores of students taught using conventional strategy were 8.16 and 15.83, respectively, with standard deviations of 1.29 and 1.83, respectively. The differencein the pre-test and post-test mean achievement scores for thequestioning, and conventional instructional strategies was 32.39, and 7.67, respectively, with those taught using questioning instructional strategy achieving the highest mean gain.

**Hypothesis One**: There is no significant difference in mean achievement score of Biology students taught questioning and conventional lecturing instructional strategies.

**Table 2: ANOVA Comparing the Mean Achievement Score of Biology Students Taught Using Questioning and Conventional Instructional Strategies.**

**ANOVA**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Pretest Score | Between Groups | .287 | 2 | .144 | .090 | .914 |
| | Within Groups | 625.015 | 390 | 1.603 | | |
| | Total | 625.303 | 392 | | | |
| Posttest scores | Between Groups | 68367.151 | 2 | 34183.576 | 683.426 | .000 |
| | Within Groups | 19506.991 | 390 | 50.018 | | |
| | Total | 87874.142 | 392 | | | |

Table 2 showed that the ANOVA comparison of the pre-test scores of Biology students taught using questioning and conventional instructional strategies is not significant ($F = .090$, $P \geq 0.05$). This implies that the students were the same in respects to the knowledge of the biology concepts before they were taught. With this result, $Ho_1$ was not accept rejected. Thus, there is a significant difference in mean achievement score of Biology students taught using cooperative learning, questioning and conventional lecturing instructional strategies.

**Research Question 2:** Is there any difference in mean interest score of Biology students taught questioning and conventional lecturing instructional strategies?

**Table 3: Comparison of the Mean (X) Interest Score of Biology Students taught using Questioning and Conventional Lecturing Instructional Strategies**

| Instructional Strategies | N | Pre- Interest Test | | Post-Interest Score | | Mean Gain |
|---|---|---|---|---|---|---|
| | | $\bar{x}$ | SD | $\bar{x}$ | SD | |
| Questioning | 130 | 29.15 | 3.36 | 53.18 | 12.66 | 24.03 |
| Conventional | 166 | 29.09 | 3.35 | 31.09 | 3.31 | 2.00 |
| Total | 296 | | | | | |

Table 3 revealed the mean and standard deviation of the interest score of Biology students taught using, questioning, and conventional lecturing instructional strategies. In the table, the means of the pretest and posttest scores of students taught questioning instructional strategy are 29.15 and 53.18, with standard deviations of 3.36 and 12.66, respectively. The means of the pretest and posttest scores of students taught using conventional lecture instructional strategy were 31.09 and 29.09, respectively, with standard deviations of 3.31 and 3.35, respectively.

**Hypothesis Two**: There is no significant difference in mean interest score of Biology students taught using questioning and conventional instructional strategies.

**Table 4: ANOVA Comparing the Mean Interest Score of Biology Students Taught Using Questioning and Conventional Instructional Strategies.**

**ANOVA**

| | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Interest pretest | Between Groups | 3.651 | 2 | 1.825 | .148 | .863 |
| | Within Groups | 4821.988 | 390 | 12.364 | | |
| | Total | 4825.639 | 392 | | | |
| Interest posttest | Between Groups | 54027.775 | 2 | 27013.887 | 425.050 | .000 |
| | Within Groups | 24786.307 | 390 | 63.555 | | |
| | Total | 78814.081 | 392 | | | |

Table 4 showed that the ANOVA comparison of the interest pre-test scores of Biology students taught using questioning and conventional instructional strategies is not significant ($F = .148$, $P \geq 0.05$). This implies that the students were the same in their level of interest in Biology before they were taught.

On the interest post-test scores, the ANOVA result ($F=425.050$, $P \leq .05$) indicated a significant difference in mean interest score of Biology students taught using questioning and conventional instructional strategies. With this result, $Ho_2$ was rejected. Thus,there is a significant difference in mean interest score of Biology students taught with questioning and conventional instructional strategies.

**Research Question 3:** Is there any difference in the mean achievement scores of male and female students taught Biology using questioning instructional strategy?

**Table 5: Comparison Between the Mean ($\bar{x}$) Achievement Scores of Male and Female Students Taught Biology Using Questioning Instructional Strategy.**

| Sex | N | Pretest score | | Post Test Score | | Mean Gain |
|---|---|---|---|---|---|---|
| | | $\bar{x}$ | SD | $\bar{x}$ | SD | |
| Male | 58 | 11.38 | 1.63 | 42.26 | 9.26 | 30.88 |
| Female | 72 | 10.85 | 1.84 | 39.28 | 8.58 | 28.43 |
| Total | 130 | | | | | |

Table 5 revealed the mean and standard deviation of the achievement score of male and female students taught Biology using questioning instructional strategy. In the table, the means of the pretest and posttest scores of male students taught using questioning instructional strategy are 11.38 and 42.26 with standard deviations of 1.63 and 9.26, respectively. The means of the pretest and posttest scores of female students taught using the questioning instructional strategy are 10.85 and 39.38, with standard deviations of 1.84 and 8.58, respectively. The difference between the pretest and posttest mean achievement scores for the male and female students was 30.88 and 28.43, respectively, with male students taught using questioning instructional strategy achieving a slight higher mean gain than the female.

**Hypothesis three**: There is no significant difference between the mean achievement scores of male and female students taught Biology using questioning instructional strategy.

**Table 6: T-Test Comparing the Mean Achievement Scores of Male and Female Students Taught Biology Using Questioning Instructional Strategy.**

| | Sex | N | Mean | Std. Deviation | df | t-cal. | Sig. (2-tailed) | Remark |
|---|---|---|---|---|---|---|---|---|
| Pretest | Males | 58 | 11.38 | 1.63 | 128 | 1.72 | .09 | Null hypothesis not rejected |
| | Female | 72 | 10.85 | 1.84 | | | | |
| Posttest | Males | 58 | 42.26 | 9.26 | 128 | .18 | .06 | Null hypothesis not rejected |
| | Female | 72 | 39.28 | 8.58 | | | | |

Table 6 revealed the mean and standard deviation of the achievement score of male and female students taught Biology using questioning instructional strategy. In the table, the mean and standard deviation of the achievement score of male and female students taught Biology using questioning instructional strategy is not significant. This implies that the students were the same in their knowledge of Biology before they were taught. On the post-test scores, the t-test analysis the p-value (.15) of the calculated t-value (.18) is greater than 0.05. With this result, $Ho_5$ was accepted. Thus there is no significant difference between the mean achievement scores of male and female students taught Biology using questioning instructional strategy.

**Research Question 4**
Is there any difference between the mean interest scores of male and female students taught Biology using questioning instructional strategy?

**Table 7: Comparison Between the Mean($\bar{x}$) Interest Scores of Male and Female Students Taught Biology Using Questioning Instructional Strategy.**

| Sex | N | Pre-interest score | | Post interest Score | | Mean Gain |
|---|---|---|---|---|---|---|
| | | $\bar{x}$ | SD | $\bar{x}$ | SD | |
| Male | 58 | 29.74 | 3.53 | 51.97 | 11.49 | 22.23 |
| Female | 72 | 28.67 | 3.17 | 54.17 | 13.52 | 25.5 |
| Total | 130 | | | | | |

Table 7 revealed the mean and standard deviation of the achievement score of male and female students taught Biology using questioning instructional strategy. In the table, the means of the pretest and posttest scores of male students taught using questioning instructional strategy are 29.74 and 51.97 with standard deviations of 3.53 and 11.49, respectively. The means of the pretest and posttest scores of female students taught using the questioning instructional strategy are 28.67 and 54.17, with standard deviations of 3.17 and 13.52, respectively. The difference between the pretest and posttest mean achievement scores for the male and female students was 22.23 and 25.50, respectively, with male students taught using questioning instructional strategy achieving a slight higher mean gain than the female. To find out whether the mean difference is significant, $Ho_6$ was tested with t-test and presented in Table 8 below.

**Hypothesis four:** There is no significant difference between the mean interest scores of male and female students taught Biology using questioning instructional strategy**.**

**Table 8: t-test Comparing the Mean (X) Interest Scores of Male and Female Students Taught Biology Using Questioning Instructional Strategy**.

| | Sex | N | Mean | Std. Deviation | df | t-cal. | Sig. (2-tailed) | Remark |
|---|---|---|---|---|---|---|---|---|
| Pretest | Males | 58 | 29.74 | 3.53 | 128 | 1.83 | .07 | Null hypothesis accepted |
| | Females | 72 | 28.67 | 3.17 | | | | |
| Posttest | Males | 58 | 51.97 | 11.49 | 128 | -.99 | .33 | Null hypothesis accepted |
| | Females | 72 | 54.17 | 13.52 | | | | |

Table 8 revealed the mean and standard deviation of the interest score of male and female students taught Biology using questioning instructional strategy. In the table, the mean and standard deviation of the interest score of male and female students taught Biology using questioning instructional strategy is not significant. This implies that the students were the same in their knowledge of Biology before they were taught. On the post-test scores, the t-test analysis the p-value (.33) of the calculated t-value (-.99) is greater than 0.05. With this result, $Ho_6$ was accepted. Thus there is no significant difference between the mean interest scores of male and female students taught Biology using questioning instructional strategy.

**Discussion of Results**

**Achievement Score of Biology Students Taught using Questioning and Conventional Instructional Strategies.**

The finding indicated that there was a significant difference in the mean achievement score of biology students taught using questioning and conventional lecturing instructional strategies. The students in the experimental group may have participated more actively in the learning process than those in the conventional instructional strategy, which may have contributed to their higher achievement scores, as evidenced by the fact that students taught using the questioning strategy performed better than those in the control group.

This finding is consistent with Oyovwi (2020) who showed that students are engaged in meaningful learning when they take active part in learning activities. The finding also aligns with Najmonnisa *et. al.,* (2021), Ugwuanyi (2016) and Etaneki (2021) who revealed that using the questioning instructional method, teachers are better able to keep an eye on and

modify the communication patterns in the classroom to foster an atmosphere that is favourable for both classroom learning and knowledge acquisition, which improves the achievement of learners. The results are also consistent with those of Umoru and Oluwafemi (2020), who found that business studies students who were taught using the questioning teaching approach performed better and had higher post-test mean scores than those who were taught using the conventional teaching strategy.

**Interest Score of Biology Students Taught Using Questioning and Conventional Lecturing Instructional Strategies**

There was a significant difference in the mean interest score of biology students taught using questioning and conventional instructional strategies. The finding might be explained by the different instructional strategies used in each group. The students in the experimental groups may have participated more actively in the learning process than those in the conventional instructional strategy, which may have stimulated their level of interest, as evidenced by the fact that students taught using questioning strategy have higher mean interest score compared to the control group. This finding in line with Yunusa, Abdulwahid and Adullahi (2014), whose findings indicate that questioning instructional strategy significantly affects student interest which was also in line with Eriba and Samuel (2018).

**Achievement Scores of Male and Female Students Taught Biology Using Questioning Instructional Strategy.**

There is no significant difference in the mean achievement scores of male and female students taught biology using questioning instructional strategy. The finding might be explained by the fact that the Questioning Instructional Strategy was used since it gave all students an equal chance to engage in active learning, which piqued the interest of both male and female students. This result was consistent with that of Samba, Kpiranyam, and Oyovwi (2021), who found no significant difference between the mean performance scores of male and female students who were taught using the AQIS in biology.

**Interest Scores of Male and Female Students Taught Biology Using Questioning Instructional Strategy.**

From the analysis, there is no significant difference between the mean interest scores of male and female students taught Biology using questioning instructional strategy. The reason for this finding was due to the nature of questioning strategy that allow teacher stimulate all student irrespective of sex to explore values and attitudes. This finding is in line with the findings of Abanikannda (2018), Onu, Anyaegbunam, and Uzoigwe (2020), Ryan (2015), Ashleyann, (2015) who reported that there is no significant difference between the mean interest scores of male and female. However, this finding disagree with Samba, and Kpiranyam, (2021) who showed that there is a significant difference between the mean interest scores of male and female students taught using questioning instructional strategy.

**Conclusion**

The study examined effect of questioning instructional strategy on academic achievement and interest of Biology Students**.** From the study, it can be concluded that the use of questioning instructional strategy enhances the academic achievement and stimulates interest of students in Biology better than lecture instructional strategy.

**Recommendations**

1. Biology teachers should make a deliberate effort to incorporate questioning instructional strategyin teaching Biology curriculum so as to promote and encourage social interaction, critical thinking, active engagement in learning, learning by doing and learning by experience in the classroom as well as their academic achievement and interest.
2. The curriculum planners and designers should ensure that they incorporate questioning instructional strategy in Biology curriculum in order to promote students' academic achievement and students interest in the subject.
3. Biology teachers should ensure active participation of both male and females during the teaching and learning of Biology through the use of questioning instructional strategy to maintain optimal academic achievement and interest among students irrespective of sex**.**
4. In view of the fact that questioning instructional strategy was proved to be more effective in teaching biology and enhancing student's academic achievement and interest, the Ministries of Education should ensure that textbook authors incorporate the strategy in the instructional methods for senior secondary schools.
5. Regular workshops, seminars and symposia on topics/ biology concepts should be organized from time to time through universities for Biology teachers in secondary schools so that they would be exposed on how to use the questioning instructional strategy in teaching Biology curriculum

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