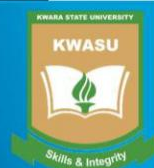


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## UTILIZATION OF INNOVATIVE SCIENCE TEACHING STRATEGIES BY BIOLOGY TEACHEARS IN SENIOR SECONDARY SCHOOLS IN SOUTH WEST, NIGERIA

By

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### Abstract

Teachers have created a number of innovative teaching techniques that, when applied, have been shown to improve students' academic performance. Unfortunately, biology students continue to perform below expectations, which leads to the belief that teachers are not utilizing a variety of teaching strategies to address the challenges involved in teaching and learning the subject. This study looked into how senior biology teachers in South-West Nigerian schools used a few innovative teaching techniques. The study aimed to ascertain the extent to which biology classrooms employ innovative teaching practices. The objectives of the study was to determine the level of utilization of innovative teaching strategies in biology classrooms. A survey-style descriptive research design was employed. All senior secondary school science instructors in the southwest of Nigeria made up the population. Six hundred and Sixty-two (662) biology teachers from the southwest form the sample, while the target population consisted of all biology teachers in senior secondary schools in the southwest of Nigeria. A researcher-designed questionnaire with a reliability coefficient of 0.84 was used to collect the data. The Result indicated that there was little use of creative teaching techniques by biology instructors. This suggests that the advantages of using cutting-edge teaching techniques won't be available to the biology students. The study concluded among others, that encouraging the use of creative teaching techniques was a good idea.

**Keywords:** biology teachers, utilization, innovative strategies, senior schools

## Introduction

The fundamental objective of education is to make individuals of any society self-reliant, literate, and expand their understanding as well as their capacity to think critically. Biology, which is studied in senior secondary schools, is a natural science focusing on life and living organisms, including how organisms evolve, their distribution, structures, how their body parts function, growth, features, and taxonomy. There has been widespread criticism about the clear variance in the quality of science teaching at the secondary school level in Nigeria. Gbadamosi (2014), Obikezie, Okpala and Amobi (2022) all argued that there are various challenges related with the teaching of science, especially biology, some of which are: inactivity, misrepresentation, passive learning, over-reliance of students on teachers, internet and texts, these factors continually lead to inadequate performance in the student's academics, their lack of skills, and correct scientific attitude, falling enthusiasm and declining enrollment in science.

There are numerous factors that is attributed to the above predicament, the most fundamental of which is that science is taught dogmatically in several schools with disjointed facts and concepts that students struggle to apply to real-life situations. Innovation in the biology classroom would bring changes to both the approach and the subject matter. This alteration has an impact on the nature and manner in which learning activities are carried out. This adjustment must be monitored and evaluated to ensure that it is meeting the objectives outlined in Nigeria's National Policy on Education (FRN, 2015).

Teaching strategies are the methods that teachers use to attain the objectives outlined in their lesson plans. A strategy can be a technique, method, or a collection of meticulously planned interactions in the classroom that can be painstakingly followed to teach a topic, concept, idea, or how the teacher decides to apply curriculum goals (Darda, 2014).

Kayode, Ogundokun, Mohammed, and Olorundare (2020), Oyelekan, Igbokwe, and Olorundare (2017) as well as Khurshid and Zahur (2013) highlighted many instructional methods that can be used in the classroom to impact knowledge. These include the lecture technique, demonstration method, project method, method, field trips, discussion method, discovery method, inquiry method, play-way and cooperative method, competitive method, and computer-assisted instruction laboratory investigation. Other creative teaching methods for science include inquiry-based learning, quick response (QR) codes, project-based learning, well-managed classroom technology, jigsaw, team teaching, and collaborative learning strategies, among others.

## Purpose Of The Study.

The purpose of the research work was to investigate the level of biology teachers' usage of innovative scientific instructional strategies in senior secondary schools in southwest Nigeria.

## Research Questions

This study intended to address the following question:

1. How often do biology teachers utilize innovative science teaching strategies in their classes?

### Methodology

The study was a descriptive survey-based study. The study included all biology teachers from public senior secondary schools in South-west Nigeria. The multi-stage sampling technique was used throughout the investigation. In the first stage, a simple random sample procedure was employed to select four of the six states in the South-west zone. Proportionate sampling techniques were adopted to choose 20% of the total number of public senior secondary schools in each of the sampled states. In total, 322 schools were chosen among 1706 public senior high schools in the four states to participate in the study. The public secondary schools were chosen based on the availability of biology instructors.

The purposeful selection strategy was used to pick just biology teachers, while the convenient sampling technique was utilized to select biology teachers who were present in each of the selected senior high schools. In total, 662 biology teachers were sampled. The study's research instrument was a questionnaire designed by the researcher titled "Biology Teachers' Utilization of Innovative Teaching Strategies" (BTUITS). The questionnaire was sectioned into sections A and B. Section A elicits the biology teacher's personal information, including their school type, gender, subject area, teaching experience, and educational qualifications. Section B elicited information on the extent to which biology teachers used twenty (20) specified innovative teaching strategies. It featured four response modes: frequently used, occasionally used, seldom used, and never used. Three professors from the Department of Science Education at the University of Ilorin, Nigeria, evaluated the instrument's content and face validity. The dependability of the instrument was tested by administering it to twenty (20) biology teachers in Kwara state. These teachers were not included in the study's sample, although they share features with those who were. The Cronbach Alpha formula was used to analyze the data acquired using the Statistical Package for the Social Sciences at the 0.05 level of significance, and the value was calculated to be 0.86. After the researcher had obtained permission from the selected schools' principals and discussed the purpose of the study as well as the level of involvement in the study to the instructors, questionnaires were administered to them with the help of the research assistants. Percentage, frequency, and charts were employed to answer study questions. While ANOVA and t-tests were employed to test hypotheses at the 0.05 level of significance.

### Results

The data gotten from the research question is presented and described as follows:

#### Research Question

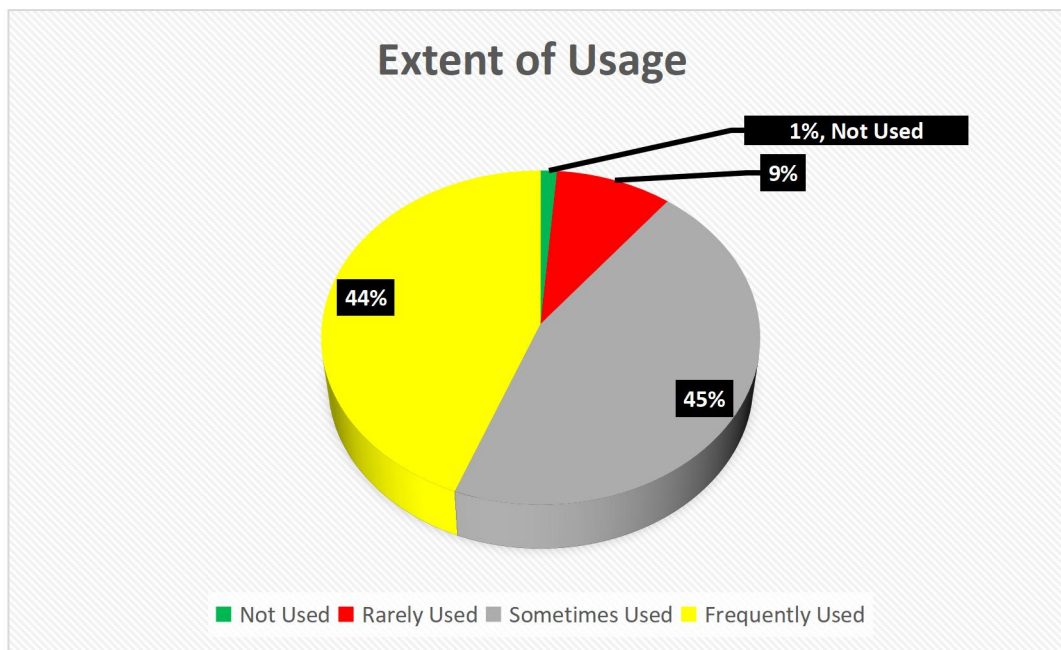
How often do biology teachers utilize innovative science teaching strategies in their classes?

Table 1 reveals the level of utilization of the innovative science teaching strategies by biology teachers. The table reveals that 44.10% of the participants frequently used the science teaching strategies, 45.30% sometimes used the teaching strategies, and 9.30% of the respondents rarely used the teaching strategies while only 1.30% of the respondents do not use any of the strategies.

Table 1:

*Frequency and percentages of Biology teachers' level of utilization of the selected innovative teaching strategies*

Level of Utilization	Frequency	Percentage (%)
Not used	8	1.30
Rarely used	58	9.30
Sometimes used	282	45.30
Frequently used	274	44.10
Total	622	100.00



## Discussion

The findings from this study reveals that biology teachers used just 44.0% of the 20 recommended innovative scientific teaching strategies on a regular basis. Forty-five percent (45%) of the instructional tactics were occasionally used, ten percent (10%) were rarely used, and one percent (1%) were never used. A sense of humor, well-managed classroom technology, activity-based instructional strategy, and mastery learning / instructional strategy were all frequently employed teaching tactics. Instructional tactics such as think-pair-share, online virtual laboratory, and peer tutoring, which alleviate anxiety and stress when dealing with difficult concepts and boost class attendance, are only employed occasionally in biology classrooms. The least used scientific teaching tactics were the Z-A approach, the Jigsaw

teamwork educational strategy, the Mnemonic-word-Words approach, and the Mind map. This implies biology students will be repeatedly denied benefits such as self-motivation, divergent thinking, improvement in the learner's psychomotor, cognitive, and affective domains, and many more, which are related with the application of most of these creative teaching methodologies.

The findings of this study also demonstrate that biology teachers (respondents) did not fully utilize all of these new teaching tactics that piqued students' interest and allowed learners to develop their own knowledge. This finding is consistent with previous research by Oludipe and Oludipe (2010), Yusuf and Adedeji (2010), Jiya (2011), Nwagbo and Chukelu (2011), and Ukala (2018) who found that while many teachers were aware of various innovative teaching strategies, only a small number of these strategies were effectively implemented. This study refuted Gbadamosi's (2014) prior study, which found that most biology teachers employ a variety of ways to deal with obstacles in teaching biology. The substantial disparity between the findings of the current study and those of Gbadamosi (2014) could be attributable to differences in geographical location as well as the novelty of the new teaching methodologies explored in the current study.

### Recommendations

The study's findings led to the following recommendations:

1. State governments, professional bodies (e.g., TRCN, NERDC, STAN), and schools should regularly organize workshops, seminars, and conferences for in-service biology teachers to promote innovative teaching strategies. Inter-state programs and trainings should be organized by state ministries of education to keep teachers up to date on instructional strategies that may be new to them. Biology teachers should also become familiar with the internet in order to stay current on innovative teaching strategies.
2. Governments and non-governmental organizations should equip schools with new instructional resources, such as computer labs and interactive devices. Teachers should be instructed on how to use such materials so that they can integrate innovative ideas into the biology classroom, thereby motivating students to learn.
3. Biology textbook authors should incorporate novel teaching tactics and demonstrate their effectiveness, particularly for rarely utilized ones.

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