IMPACT OF TEAM-TEACHING STRATEGY ON THE CHEMISTRY STUDENTS' ATTITUDE AND ACADEMIC ACHIEVEMENT IN GWAGWALADA AREA COUNCIL, FEDERAL CAPITAL TERRITORY, ABUJA

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Abstract

The researchers examined the impact of team teaching strategy on the academic and attitude achievement of chemistry students in Gwagwalada Area Council, Abuja. There were 31,883 SS I1 Chemistry students in the population for the study, of which 160 students were chosen by purposive sampling. The study was created using a quasi-experimental research design. The two tools used to collect the data were the Chemistry Achievement Test (CAT) and the Chemistry Students' Attitude Inventory (CSAI).Using the Kuder-Richardson formula-21, the reliability co-efficient for CAT was determined to be 0.89; however, when Cronbach alpha was employed, the reliability co-efficient for CSAI was found to be 0.88. While descriptive statistics like mean and standard deviation were used to analyze the research questions, ANCOVA was used to analyse the statements of hypotheses. The analysis showed that employing the team teaching approach improved students' academic achievement in chemistry more than the lecture approach did with positive attitude.

Key words: Achievement and Attitude, Team Teaching, Lecture Method.

Introduction

Using some of the researched-based instructional methods is one way for instructors and subject handlers to improve students' academic achievement in chemistry in particular and sciences in general across schools and among learners in the 21st century learning classroom. Citizens must be equipped with 21st-century skills, which emphasizes the modern classroom and places learners at the center of the process of education and instruction. Science classes are stimulating and difficult according to numerous learners. This could be the general viewpoint of the students, which could influence how they feel about science in general and chemistry in particular. Since many research-based teaching strategies are believed to increase students' academic achievement in the sciences and increase their curiosity in the subject when applied correctly, they have been found to be advantageous and helpful in assisting students in realizing their full abilities.

Peer teaching, team teaching, and experiential learning are a few of them. According to avalanche data, instructors are more accustomed to the antiquated didactic teaching methods, which some scholars have linked to the recent decline in students' academic achievement in the subject. Even though team teaching is an instructional technique as well, its applications have the potential to enhance learning when done correctly. As a result, it has been demonstrated that using team teaching techniques to deliver lessons is effective and has improved the achievement of learners in subjects other than science (Ablye-Taylor (2014).

When two or more teachers collaborate to organize, carry out, and assess learning activities for a single student body, this is known as team teaching. Teaching in teams, also known as "working together teaching," gives learners access to a wider range of viewpoints and subject matter than one instructor might be able to offer. Team teaching is defined as an instructional activity that takes place in a single physical location and involves a group of instructors who share planning, executing, evaluating, and determining duties (Ajayi, Achor, & Agogo,2017).

According to Quinn and Kanter (2013), team teaching is a method in which two certified teachers work as a true team to present material to an audience. When a number of educators work together in a team, their main goal is to share their experiences in the classroom and engage in co-generative dialogue. They accept

shared accountability for optimizing learning to teach or improving as educators while offering their students additional chances to learn. According to Ablye-Taylor (2014), team teaching is different from instruction given by a single instructor in terms of collaboration, support, and interactions.

According to Tiinamaija and Antti 2023, team teaching entails a group of teachers (four or five) who are actively involved in all facets of subject development, including creating learning activities, assigning topics in a unit plan, scheme of work, or lesson plan, and developing a suitable assessment tool. They also clarified that when a member of a team teaches, the topics, units, and other planned activities are distributed equally. This allows the member who is not teaching to spend their time on evaluation, grading, creating instructional materials, and providing support to the member who is teaching by watching him present or helping with the demonstrators and practical exercises in small groups.

Team teaching is specifically defined by Mononen et al., (2023), as a group of teachers working collaboratively, decisively, and consistently to support a group of students of any age in their learning. The author goes on to say that teachers who use team teaching collaborate to create course objectives, instruct (explain), and assess students' learning. The goal of team teaching is to help students comprehend ideas from multiple perspectives. The goals that guide team-teaching strategies are to promote a collaborative effort where teachers and students participate in an intellectual dialogue that ultimately serves the interests of both (Team Teaching Strategy, 2023). Merrill (2014), cited in Darma (2018), defines team teaching as an educational setting in which two or more teachers with complementary teaching modalities collaboratively plan and carry out instruction for a single student group, utilizing flexible scheduling and grouping strategies to address the unique instructive needs of learners.

To put it another way, team teaching involves two or more colleagues—typically academics, but occasionally also professionals and/or administrative colleagues—planning, carrying out, and assessing the unit of study, including assessment, for the same set of learners. Team teaching, by definition, requires that all members of the team participate appropriately and communicate well with one another.

To teach a group of learners, it entails a group of instructors working intentionally, consistently, cooperatively, and complementarily. Putting teachers in teams to create a syllabus, create lesson plans or guides, teach classes, and then jointly assess the

outcome. It is thought that the academic achievement of learners will increase when science educators employ team teaching effectively.

Darma (2018) state that the method comprises working together with two or more teachers to plan, execute, and evaluate the unit of study for the same group of students. By definition, team teaching requires that all teachers participate appropriately in the group and communicate well with one another. A group of instructors must work purposefully, reliably, collaboratively, and in combination in order to instruct a group of learners. Put another way, collaborative teachers establish objectives, work together to develop a curriculum, lesson plan, or guide, instruct students, and evaluate the results. Knowing the co-teaching framework beforehand will help you better understand the concept of team teaching, which is one of the unique instructional models of co-teaching according to Darma (2018). Worldwide higher education institutions have been using team teaching at different levels and for different purposes since the 1960s.

In the past, team teaching was seen as a way to better manage large classes of students or regulate the behavior of teachers. It has occasionally been thought of as a way to add diversity to the traditional classroom setting of one subject taught by one teacher. The relevance of interpersonal and intrapersonal knowledge in team teaching has been discussed, and cooperative instruction has recently been placed within the framework of school growth (Ifeanachi,2015)

Marble (2017) examined the effects of a team teaching approach on students' mathematical proficiency. The outcomes showed a significant difference between the control group and the students who received math instruction using Team Teaching. Ifeanachi (2015) also looked at the effects of web-assisted learning along with team teaching. The authors spoke with the instructors in-depth before starting the study in order to gain a deeper understanding of their perspectives on the idea; the outcome was fascinating. Consequently, he came to the conclusion that science education in secondary schools ought to employ a team teaching approach.

According to Isaac (2012), team teaching promotes tolerance and acceptance, and educators thought it was advantageous for all students. The study found that employing a team teaching approach works well. They feel that by offering alternative viewpoints and increasing the chances for one-on-one assistance between two sections of the same level, team teaching improves them. When introducing team-teaching, Agommuoh (2016) asked students to rank their feelings about the

approach. He discovered that after learning about the strategy, learners gave it higher ratings than they did the other teacher-centered techniques.

Since attitude can motivate students to participate in lab experiments and improve their grades, attitude plays a crucial role in the teaching and understanding of chemistry. An attitude is a feeling that originates within and manifests itself in behavior. Positive attitudes toward learning chemistry will benefit students' performance, but the opposite is also true (Omale and Adineran, 2024). According to Nkechi et al. (2015), students who experienced science classes in a team setting had more fun and exhibited less age disparities in their attitudes toward science than fellow learners.

For years, a variety of instructional techniques used in the study of chemistry have been unable to raise instructional effectiveness or attitude. As a result, students have struggled to comprehend chemistry and apply most of the material to practical situations. Low academic achievement and a negative attitude have been linked to a number of factors, such as the qualifications and competency of teachers, the attitudes of both teachers and learners, the use of teaching methods, the lack of instructional resources, and many more. (Okorodudu, 2019).

Parents, learners, and other interested parties began to voice serious concerns regarding the teachers' deteriorating behavior and attitude. The researchers are investigating how the team teaching strategy and traditional method affect the academic achievement and attitude of Chemistry students in secondary schools in Gwagwalada area council, Federal Capital Territory, Abuja, in an attempt to address these disparities.

Research Questions

The following research questions were answered by the study.

1. What is the mean achievement scores of senior secondary school students taught chemistry using team teaching approach and those taught using lecture method?
2. What is the mean attitude rating of students taught chemistry using the team teaching approach and those taught using the lecture method?

Research Hypotheses

$H0^1$: There is no significant difference in the mean achievement scores of senior secondary school students taught chemistry using team teaching approach and that taught using lecture method.

$H0^2$: There is no significant difference in the mean attitude rating of students taught chemistry using the team teaching approach and those taught using the lecture method.

Methodology

For this study, a non-equivalent group quasi-experimental design was used. The Federal Capital Territory (FCT) of Abuja's Gwagwalada Area Council served as the study's site. The Gwagwalada Area Council in Abuja is home to fourteen senior secondary schools (SEB,2024). There are 31,880 science students in SS1I. The sample size consisted of 160 SS1I students out of the total population. The following four schools took part in the study: The government secondary schools in Gwako, Anagada, Giri, and Dobi are the ones that operate in that capacity. The experimental group consisted of government secondary schools Anagada and Dobi, while the control group was made up of government secondary schools Gwako and Giri. There were 65 females and 95 males among them.86 students were taught using the traditional method in the control group, and 74 students were taught using the team teaching strategy in the experimental group. The schools in the control group those that taught using the lecture method were chosen through a straightforward random sampling process. But a deliberate sample was taken from the two schools that served as the experimental group (those that taught using a team teaching approach). Because those are the school districts where the team teaching approach is already in place, purposive sampling was chosen. The pupils were in their complete courses.

Data were collected from the respondents using the Chemistry Achievement Test (CAT) and the Chemistry Student Attitude Inventory (CSAI). The purpose of the CAT is to evaluate students' comprehension and knowledge of chemistry topics as they are taught in teams of two or more. The entire curriculum's worth of content was covered by CAT items, which were taught using the team approach. Salt, bases, and acids were the subjects of instruction. Two instructors from the University of Abuja's Department of Science Education (Chemistry) who are knowledgeable about the chemistry curriculum and the team approach examined the test items. They offered input regarding each item's alignment with the learning objectives, relevance, and clarity. An educational psychologist from the Department of Educational Psychology at the University of Abuja validated the CSAI items.

The Chemistry Students' Attitude Inventory (CSAI) trial test and the Chemistry Achievement Test (CAT) were administered to thirty students. The Cronbach Alpha was used to assess the CSAI's reliability. Because the Cronbach alpha coefficient method considers items on a continuum of Strongly Agree (SA), Agree (A), Strongly Disagree (SD), and Disagree (D), it has been determined to be an appropriate way to measure reliability. It was found that the reliability coefficient was 0.88. Using the Kuder Richardson formula-21, the CAT's reliability was evaluated. Thus, the co-efficient was 0.89. The mean and standard deviations of descriptive statistics were used to provide the answers to each research question. Using Analysis of Covariance, hypotheses were tested at 0.05 significant levels (ANCOVA).

Results

Table 1: Mean Achievement Scores and Standard Deviation of Students in team teaching strategy and lecture group

Groups	**N**	**Pretest**		**Posttest**		
		Mean	SD	Mean	SD	Mean gain
Team Teaching	74	54.11	4.53	83.57	5.78	29.46
Traditional Method	86	53.50	4.36	61.63	6.06	8.13
Mean Difference		0.61		21.94		
Total	**160**					

According to Table 1, the lecture group had a mean accomplishment score of 53.50 with a standard deviation of 4.36 on the pretest, while the team group had a mean fulfillment score of 54.11 with a standard deviation of 4.53. In the posttest, the lecture group scored an average of 61.63 with a standard deviation of 6.06, while the team group scored an average of 83.57 with a standard deviation of 5.78.

Analyzing the findings of the Pretest and Posttest, the mean gain for the lecture group was 8.13 and the mean gain for the team group was 29.46. The achievement scores of the lecture and team groups differed by a mean of 0.61 on the pretest and 21.94 on the posttest, respectively.

Table 2: Mean Attitude Ratings and Standard Deviation of Students in team teaching strategy and lecture Method Groups

Groups	**N**	**Pre-attitude**		**Post-attitude**		**Mean Gain**
		Mean	SD	Mean	SD	
Team	74	1.38	0.30	2.76	0.61	1.38
Lecture	86	1.37	0.31	1.93	0.34	0.56
Mean Difference		0.01		0.83		
Total	**160**					

Prior to treatment, the lecture group's mean attitude rating was 1.37 with a standard deviation of 0.31, while the team group's mean attitude rating was 1.38 with a standard deviation of 0.30. Following treatment, the lecture group's mean attitude rating was 1.93 with a standard deviation of 0.34, while the team group's mean attitude rating was 2.76 with a 0.61 standard deviation. The lecture group saw a gain of 0.56, while the team group experienced a mean increase of 1.38 before and after treatment. The attitude assessments of the traditional groups and the team teaching strategy had a mean difference of 0.01 prior to treatment, but it had decreased to 0.83 following it.

Test of Hypotheses

Table 3: Summary of Analysis of Covariance (ANCOVA) of the Achievement Scores of Students in Team Teaching and Lecture Groups

Source of Variance	**Sum of Squares**	**Df**	**Mean Square**	**F**	**Sig**
Corrected Model	19263.654[a]	2	9631.827	277.965	.000
Intercept	4127.656	1	4127.656	119.120	.000
Pretest	118.010	1	118.010	3.406	.067
Group	18850.716	1	18850.716	544.013	.000
Error	5440.246	157	34.651		
Total	848968.000	160			
Corrected Total	24703.900	159			

Table 3 displays the results of the ANCOVA analysis of the data derived from the posttest results of students who were taught chemistry through both the lecture and team teaching approaches. Given that the analysis revealed F (1,157) = 544.013, p0.05, the null hypothesis was rejected. This indicates that the achievement scores of students who were taught chemistry through a combination of lecture and team teaching strategies differed statistically significantly. This implies that the accomplishment results of the team group were superior to those of the students in the lecture group.

Table 4: Summary of Analysis of Covariance (ANCOVA) of team and lecture Groups' Attitude Ratings towards Chemistry

Source of Variance	Sum of Squares	Df	Mean Square	F	Sig
Corrected Mode	11058.311[a]	2	5529.155	222.121	.000
Intercept	17057.523	1	17057.523	685.246	.000
Pre-Attitude	10.672	1	10.672	.429	.514
Group	11055.688	1	11055.688	444.136	.000
Error	3908.133	157	24.893		
Total	356939.000	160			
Corrected Total	14966.444	159			

The findings of an ANCOVA analysis of attitude inventory data from students taught chemistry in teams using the team teaching strategy versus students taught chemistry using the lecture method are displayed in Table 4. Based on the study's findings, the null hypothesis was rejected (F(1,157) = 444.136, p0.05). This shows that there is a statistically significant difference, favoring the team teaching strategy, in the mean attitude evaluations of students taught using the team teaching strategy toward chemistry compared to those taught using the lecture method. This implies that the attitude rating of the team group was superior to that of the lecture group.

Discussion of Findings

The results showed that adopting the team teaching approach significantly raised student's achievement. Table 1 illustrates how students in both lecture and team groups performed prior to treatment. The team and lecture groups' achievement scores differed by 0.61 and 21.94 points, respectively. This demonstrates

unequivocally that team group students achieved more than lecture group students did. Additionally, there was a significant difference in the achievement scores of students in the team and lecture groups in chemistry, as indicated by the p value of.00 in Table 3's test of hypothesis results. This proves that using the team teaching approach significantly raises students' achievement in chemistry. In her study, Team Teaching Strategy: An Approved Alternative Strategy for Lesson Delivery and Improving Students' Academic Achievement in Science in Secondary Schools, Njoku (2022) discovered that the use of this strategy enhances students' achievement in junior secondary schools in integrated science in Port Harcourt, Nigeria.

Learners in the team and traditional groups had mean attitude ratings prior to treatment, as Table 2 demonstrates. Before and after treatment, there was a 0.01 and 0.83 difference in the attitude assessments of the team and lecture groups, respectively. This indicates unequivocally that, in terms of attitude ratings, students in the team group improved more than those in the lecture group. Additionally, there was a significant difference in attitude ratings between students in the team and traditional groups in chemistry, as indicated by the p value of.00 in Table 4's test of hypothesis results. This proves that using the team teaching method significantly raises students' chemistry-related attitudes. The results of the study "Effect of Asei Teaching Strategy and Lecture Method on Students' Achievement and Attitude in Chemistry in Secondary Schools n Federal Capital Territory, FCT, Abuja" by Omale and Adineran (2024) are in line with this finding. The study found that students who learn chemistry in a group setting have a more positive attitude toward the subject.

Conclusion

A dynamic, collaborative learning environment is produced through team teaching. With the help of this strategy, educators can better meet the needs of each individual student, offer more engaging material, and increase student engagement—all of which can boost learners' motivation and attitudes toward learning. Furthermore, research has demonstrated that group instruction improves the comprehension of learners of difficult subjects and fosters higher order thinking abilities, which improves academic performance.

Recommendations

The aforementioned study led to the recommendations listed below. Among these are the following:

1. The Gwagwalada Area Council Government should provide space for teachers to receive training in the team teaching technique since it fosters an atmosphere in which students feel at ease interacting with multiple teachers.
2. The team teaching approach is something that chemistry teachers ought to implement since it meets the needs of a wide range of students, including those who struggle with learning.

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