



Which Way Forward in Effecting Biology Curriculum; Assisted Discovery or Showcase Approaches on Academic Achievement and Enthusiasm

Wilson, Augustina¹; Oyovwi, Edarho Oghenevwe²

^{1&2}Department of Science Education, Faculty of Education, Delta State University, Abraka.

+2348034847923; +2348159702356; edarho63@gmail.com

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ABSTRACT

The aim of the enquiry was to explore potential pathways for effecting the biology curriculum, specifically focusing on the bearing of assisted discovery versus showcase approaches on students' performance and enthusiasm in biology within the Delta Central Senatorial District. To steer the enquiry, four research inquiries and conforming hypotheses were developed. Employing a pre-test, post-test planned variation quasi-experimental blueprint, the enquiry encompassed a population of 9,146 SSII Biology students in government-funded high schools in the Delta Central Senatorial District. The sample comprised 361 SSII biology students from six unaltered classes. Data were collected applying the Biology Achievement Test (BAT) and Biology Enthusiasm Scale (BIS), both exhibiting reliability values of 0.89 and 0.71, as determined by Kuder-Richardson 21 and Cronbach Alpha, respectively. Analysis of the obtained scores utilized descriptive and inferential statistics, revealing a noteworthy bearing of both assisted discovery and showcase approaches on biology students' average achievement and enthusiasm scores. Although a remarkable disparity existed in the average achievement scores amid students instructed with assisted discovery and showcase approaches, with assisted discovery yielding higher scores, no remarkable contrast was perceived in enthusiasm scores. Consequently, the researcher concludes that both assisted discovery and showcase approaches effectively enhance students' achievement and enthusiasm in biology. However, assisted discovery practice outperforms showcase approach in promoting students' achievement in biology. The enquiry advocates for the adoption of assisted discovery practice by biology instructors at the secondary school tier. In instances where essential materials for assisted discovery are absent, the enquiry suggests the deployment of showcase approach as a viable alternative for effective biology instruction.

Keywords: Assisted discovery, Demonstration, Curriculum, Achievement and Enthusiasm

Introduction

The widespread popularity of Biology among Adolescent scholars is evident in the substantial enrollment numbers for Biology in external examinations across various disciplines like arts, science, or humanities. This surge in enthusiasm en route Biology can be ascribed to its innate nature as a subject that sheds light on everyday life, the environment, plant and animal life, and human health. Defined as the enquiry of living organisms (Akunwa & Obidiwe, 2013), Biology delves into the intricate interplay amid living organisms and their surrounding environment, holding vital significance for human existence. Similar to other evidence-based disciplines, Biology follows the evidence-based practice, which entails meticulous observation, thorough analysis, and precise recording, among other evidence-based practices. The aims of the Biology syllabus for Senior High School, outlined in the National Policy on Education (FRN, 2013), seek to equip students with practical laboratory and field skills, in-depth knowledge, a mindset grounded in practical evidence, and the ability to apply evidence-based principles to real-world situations related to personal and community health as well as agricultural practices.

Biology, with its various branches, holds remarkable relevance across numerous facets of human life, ranging from Medicine and Agriculture to Biodegradation and Petrochemical industries. According to Ugwu and Eze (2015), delving into the enquiry of Biology equips individuals with a profound analogues of themselves, their bodily functions, and anatomy, thereby laying the foundation for pursuing lucrative and challenging career paths in fields like Medicine, Nursing, Pharmacy, Biochemistry, Agriculture, Microbiology, Geology, Geography, Technology, and other applied sciences. However, notwithstanding the paramount importance of Biology, there is a troubling pattern of inadequate academic achievement among adolescent scholars in Nigeria, particularly in Biology (Irede, 2018). This deficiency becomes evident in their results on assessments such as the West African Senior School Certificate Examination (WASSCE) and the National Examination Council (NECO). Oyovwi and Iroriteraye-Adjekpovu (2021) emphasize that students' inadequate analogues of curriculum concepts frequently causes them to skip questions pertaining to those areas in the Senior Secondary Certificate Examination (SSCE), ultimately leading to second-rate performance.

Researchers have linked the perceived decline in students' scholastic performance in Biology to biology instructors' tendency to prioritize theoretical presentation of biology concepts over practical applicability and the employment of ineffective teaching practices (Oyovwi & Iroriteraye-Adjekpovu, 2021). The teaching approach adopted by instructors plays a pivotal role in either augmenting or hindering students' achievement and enthusiasm in

Biology. Hence, it is crucial for biology educators to employ practices that encourage student commitment and active participation in the instruction and study process. One such exercise is the assisted discovery approach, which involves instructional facilitation via guiding students in exploration, inquiry, and problem-solving. Rather than simply providing answers or information, instructors assist students in independently discovering concepts, principles, or solutions. This approach functions as a powerful instructional tool, motivating learners to delve into information, construct new ideas, discern relationships, and develop fresh models of thinking and behavior (Emerhiona, Ajaja, Pius, Nwanze & Izuegbuna, 2018). The assisted discovery exercise fosters learners' exploration of content via concrete experiences, characterized by convergent thinking and the opportunity for students to uncover principles or explanations with minimal guidance from the instructor (Ozioko, 2015).

Alternatively, the showcase approach, as described by Omwirhiren and Khalil (2016), represents a practical teaching approach characterized by showing, doing, and explaining. In this practice, the instructor demonstrates the steps of a process while providing clear and accurate explanations, and students are expected to involve by practicing the demonstrated actions. The showcase approach is renowned for spanning the gap amid theory and practice, necessitating meticulous planning, preparation, and precise instructions for effective enactment (Arubayi, 2015). Both academic achievement and enthusiasm in mastery play pivotal positions in the instruction and study process across all subjects, including Biology. Academic achievement functions as a benchmark for successful instruction, reflecting the degree to which instructional objectives have been attained by both educators and learners. Elevated academic achievement not only signifies proficiency across diverse academic domains but also fosters a desire for continuous mastery. This thirst for ongoing knowledge acquisition, in turn, functions as a catalyst for nurturing a keen enthusiasm in mastery (Hacieminoglu, 2016).

Enthusiasm, according to Essien, Akpan, and Obot (2015), is characterized by directing the sensory organs toward or focusing attention on a person, activity, situation, or object. It entails attention coupled with a concerned feeling, lively sympathy, or curiosity, possessing the capacity to evoke or maintain such attention. The kernel of enthusiasm is intricately linked to its connection with mental activity/attention. McEntarffer and Weseley (2016) define enthusiasm as a relatively positive or negative inclination toward something, representing an internal predisposition guiding individuals via cognitive activities encompassing all sensibilities and standards. The absence of enthusiasm among students in mastery has been recognized as a contributing factor to low academic performance. The embracing of appropriate teaching practices could offer a remedy to aid students develop a strong enthusiasm in mastery, regardless of gender.

Given this context, the present enquiry seeks to delve into the path ahead regarding the enactment of the biology curriculum. It endeavors to appraise the repercussions of both assisted discovery and showcase tactics on students' scholastic performance and enthusiasm in the Biology curriculum within the Delta Central Senatorial District.

Statement of the Problem

The context underscores the persistent challenge of below-average performance in Biology among students, despite its inclusion in the curriculum for both science and non-science streams. To ensure academic success for all, it is imperious to consider specific practices, techniques, and various factors influencing student outcomes. Despite the considerable enrollment in Biology, there exists an expectation for a higher proportion of students to attain satisfactory grades.

The inadequate performance in Biology is potentially attributed to several factors, including the pedagogical practices employed by instructors. The prevalent usage of the instructor-centered lecture approach may add to this issue, as it tends to render students passive participants rather than active learners in the educational process. This highlights the requisite to explore alternative student-centered practices like assisted discovery and demonstration techniques, where students are energetically involved in their mastery journey.

Hence, the enquiry arises from the need to contrast the helpfulness of assisted discovery and showcase approaches in refining students' scholastic performance and fostering their enthusiasm in Biology. Consequently, the problem statement revolves around determining the most effective approach for effecting the biology curriculum to boost students' academic achievement and enthusiasm in the subject.

Research Questions

The enquiry was shaped by the subsequent research inquiries:

1. How do assisted discovery and showcase tactics bearing the average achievement scores of biology students?
2. How do assisted discovery and showcase approaches influence the average enthusiasm scores of biology students?
3. What variations exist in the average achievement scores amid students instructed in the biology curriculum via assisted discovery and showcase approaches?
4. What distinctions can be professed in the average enthusiasm scores among students imparted biology expending assisted discovery and showcase approaches?

Hypotheses

The enquiry was structured with the following hypotheses in mind:

Hypothesis 1 (HO1): There is no substantial bearing of assisted discovery and showcase approaches on the average achievement scores of biology students.

Hypothesis 2 (HO2): There is no considerable influence of assisted discovery and showcase approaches on the average enthusiasm scores of biology students.

Hypothesis 3 (HO3): There is no notable contrast in the average achievement scores among students instructed in the biology curriculum via assisted discovery and showcase approaches.

Hypothesis 4 (HO4): There is no noteworthy contrast in the average enthusiasm scores among students instructed in the biology curriculum via assisted discovery and showcase approaches.

Purpose of the Enquiry

Basically, the enquiry sought to investigate strategies for effecting the biology curriculum, focusing on the utilization of either assisted discovery or showcase approaches, and evaluating their effects on students' achievement and enthusiasm in the biology curriculum within the Delta Central Senatorial District. The specific objectives were delineated as follows:

- i. Evaluate the bearing of assisted discovery and showcase approaches on the average achievement scores of biology students.
- ii. Assess the influence of assisted discovery and showcase approaches on the average enthusiasm scores of biology students.
- iii. Contrast the variations in average achievement scores among students instructed in biology with assisted discovery and showcase approaches.
- iv. Examine the distinctions in average enthusiasm scores among students imparted biology via assisted discovery and showcase approaches.

Theoretical Framework of the Enquiry

The enquiry centered on Vygotsky's Socio-cultural Theory, a constructivist perspective that underscores the role of the social environment in development and mastery. According to Vygotsky (1978), the interface with people and the environment obliges as a catalyst for developmental processes and facilitates cognitive growth. Learners leverage these interfaces, along with their existing knowledge, to reorganize their mental structures. This theory forms the foundation for social mastery within the classroom setting, emphasizing the contextual nature of mastery, with the instructor serving as a facilitator.

As the " **originator**" of social constructivism, Vygotsky posited that social interface, coupled with critical thinking, was fundamental to the mastery process. He asserted that everything is acquired via two tiers: first, via interfaces with others, and then integrated into the individual's mental framework.

In the context of this enquiry, Vygotsky's theory implies that a knowledgeable instructor, adult, or more advanced peer can aid in advancing a child's academic progress. Via scaffolding or providing assistance, the student continues to progress to the ensuing tier of analogues. Assisted discovery and showcase approaches are instrumental in reaching the students' zone of adjacent development, with the instructor, knowledgeable adult, or advanced peer offering support and structuring the mastery objectives.

Research Blueprint

The research employed a pretest-posttest planned variation quasi-experimental blueprint due to the absenteeism of subject randomization. This quasi-experimental blueprint was chosen as subjects were not randomly assigned in this enquiry. The enquiry's population comprised 9,146 Senior Secondary Two (SSII) Biology students pinched from 179 government-funded high schools in the Delta Central Senatorial District. The sample for the enquiry included 361 Senior Secondary Two biology students selected from unaltered classes in six government-funded high schools within the Delta Central Senatorial District. The choice of schools for the enquiry was done randomly via a simple random selection technique involving balloting.

Research Instrument

This enquiry utilized two tools for data assemblage: the Biology Achievement Test (BAT) and the Biology Enthusiasm Scale (BIS). The Biology Achievement Test (BAT) comprised fifty multiple-choice items. The Biology Enthusiasm Scale (BIS) consisted of 20 items, with responses structured on a four-point Likert scale, ranging from Very High Enthusiasm (VH1 = 1) to High Enthusiasm (HI = 3), Low Enthusiasm (LI = 2), and Very Low Enthusiasm (VLI = 1).

Validity of the Instrument

Three experts, including a seasoned Biology Instructor and specialists in both Science Education and Measurement and Evaluation, evaluated the face and content validity of the instruments. They gauged the face validity by examining the clarity and appropriateness of the test items.

Reliability of the Instrument

The reliability of the Biology Achievement Test (BAT) was assessed via the Kuder-Richardson 21 method due to the binary nature of its items. Thirty-six SSII Biology students from a school in Uvwie Local Government Area of Delta State, which was not part of the selected schools for this study, participated in the BAT assessment. The resulting data were analyzed by Kuder-Richardson 21, revealing a reliability coefficient of 0.89.

For the Biology Enthusiasm Scale (BIS), reliability was determined by Cronbach Alpha, chosen for its suitability with Likert scale items. The BIS was administered to 47 SSII Biology students at a school in Ughelli North Local Government Area, distinct from the sampled schools. The students' responses underwent scoring and Cronbach Alpha analysis, indicating a reliability coefficient of 0.71.

Method of Data Analysis

The research questions were thoroughly examined by calculating the mean and standard deviation (st.d). Hypotheses were then rigorously evaluated at a significance threshold of 0.05 through the utilization of t-tests and Analysis of Covariance (ANCOVA).

Discussion of Results

Research Question One

How do assisted discovery and showcase approaches bearing the average achievement scores of biology students?

Table 1

Average (\bar{x}) and St.d (SD) of Pre-Test and Post-Test Achievement Scores of Students Imparted Biology Expending Assisted Discovery and Demonstration

Group	N	Pre-test		Posttest		Average Contrast
		(\bar{x})	SD	(\bar{x})	SD	
Assisted discovery	175	16.21	5.63	62.11	13.93	45.90
Demonstration	186	16.70	5.71	57.74	13.02	41.04

Table 1 presents the pre-test average (\bar{x}) achievement scores for students instructed in biology by the assisted discovery practice, with an average score of 16.21 and a st.d (SD) of 5.63. For those imparted with the showcase approach, the pre-test average (\bar{x}) achievement score was 16.70, with a st.d (SD) of 5.71. In the post-test, students in the assisted discovery group achieved an average (\bar{x}) score of 62.11, with a st.d (SD) of 13.93, while their equivalents in the demonstration group attained an average (\bar{x}) score of 57.74, with a st.d (SD) of 13.02. The average (\bar{x}) contrast amid post-test and pre-test scores for assisted discovery and showcase approaches is 45.90 and 41.04, respectively. The positive average contrast designates a positive increase in students' achievement scores in biology when applying both assisted discovery and showcase approaches. Hence, both practices influence students' average achievement scores in biology, although assisted discovery practice demonstrates a greater effect based on the average contrasts.

Hypothesis One (HO₁)

There is no substantial bearing of assisted discovery and showcase approaches on the average achievement scores of biology students.

Table 2

Summary of Paired Samples t-test Contrast of Pre-Test and Post-Test Average (\bar{x}) Achievement Scores of Students Imparted Biology By Assisted Discovery and Showcase approaches

Group	N	Pretest		Posttest		df	t-cal	sig. (2-tailed)	Remark
		(\bar{x})	SD	(\bar{x})	SD				
Assisted Discovery	175	16.21	5.63	62.11	13.93	174	42.560	0.000	HO ₁ is rejected
Demonstration	186	16.70	5.71	57.74	13.02	185	39.007	0.000	

P < 0.05

Table 2 reveals a notable bearing of the assisted discovery practice (tcal = 42.560, P(0.000) < 0.05) and showcase approaches (tcal = 39.007, P(0.000) < 0.05) on biology achievement. This outcome leads to the rejection of HO₁. Therefore, there exists a substantial influence of both assisted discovery and showcase approaches on the average achievement scores of biology students.

Research Question Two

How do assisted discovery and showcase approaches influence the average enthusiasm scores of biology students?

Table 3

Average (\bar{x}) and St.d (SD) of Pre-Test and Post-Test Enthusiasm Scores of Students Imparted Biology Via Assisted Discovery and Demonstration

Group	N	Pre-test		Posttest		Average Contrast
		(\bar{x})	SD	(\bar{x})	SD	
Assisted discovery	175	24.28	8.37	61.23	6.77	36.95
Demonstration	186	23.40	5.39	61.12	9.22	37.40

Table 3 illustrates a pre-test average (\bar{x}) enthusiasm score of 24.28, with a st.d (SD) of 8.37, for students instructed in biology via the assisted discovery practice. Conversely, students imparted with the lecture practice exhibited a pre-test average (\bar{x}) enthusiasm score of 23.40, with a st.d (SD) of 5.39. In the post-test, students in the assisted discovery group attained an average (\bar{x}) enthusiasm score of 61.23, with a st.d (SD) of 6.77, while their equivalents in the lecture group achieved an average (\bar{x}) enthusiasm score of 61.12, with a st.d (SD) of 9.22. The average (\bar{x}) contrast amid post-test and pre-test scores for assisted discovery and lecture practices is 36.95 and 37.40, respectively. The positive average contrast signposts that the utilization of assisted discovery and demonstration effectively elevated students' enthusiasm scores in biology. Consequently, both assisted discovery and showcase approaches exert an influence on students' average enthusiasm scores in biology.

Hypothesis Two (HO₂)

There is no considerable influence of assisted discovery and showcase approaches on the average enthusiasm scores of biology students.

Table 4

Summary of Paired Samples t-test Contrast of Pre-Test and Post-Test Average (\bar{x}) Enthusiasm Scores of Students Imparted Biology Using Assisted Discovery and Showcase approaches

Group	N	Pretest		Posttest		df	t-cal	sig. (2-tailed)	Remark
		(\bar{x})	SD	(\bar{x})	SD				
Assisted Discovery	175	24.28	8.37	61.23	6.77	174	42.309	0.000	HO ₂ is rejected
Demonstration	186	23.40	5.39	61.12	9.22	185	48.331	0.000	

P < 0.05

Table 4 demonstrates a noteworthy bearing of the assisted discovery practice (tcal = 42.309, P(0.000) < 0.05), and lecture practice (tcal = 48.331, P(0.000) < 0.05), on biology achievement. This outcome leads to the rejection of HO₂. Therefore, there exists a substantial influence of both assisted discovery and lecture practices on the average enthusiasm scores of biology students.

Research Question Three

What distinctions can be perceived in the average enthusiasm scores among students imparted biology using assisted discovery and showcase approaches?

Table 5

Average (\bar{x}) and St.d (SD) of Pre-Test and Post-Test Achievement Scores of Students Imparted Biology Using Assisted Discovery and Demonstration

Group	N	Pre-test		Posttest		Average Gain (MG)	Contrast in MG
		(\bar{x})	SD	(\bar{x})	SD		
Assisted Discovery	175	16.21	5.63	62.11	13.93	45.90	4.86
Demonstration	186	16.70	5.71	57.74	13.02	41.04	

Table 5 presents a pre-test average (\bar{x}) achievement score of 16.21, with a st.d (SD) of 5.63, for students instructed in biology using the assisted discovery practice. Conversely, students imparted with the showcase approach exhibited a pre-test average (\bar{x}) achievement score of 16.70, with a st.d (SD) of 5.71. In the post-test, students in the assisted discovery group achieved an average (\bar{x}) score of 62.11, with a st.d (SD) of 13.93, while their

equivalents in the demonstration group attained an average (\bar{x}) score of 57.74, with a st.d (SD) of 13.02. The average (\bar{x}) gain for assisted discovery and showcase approaches is 45.90 and 41.04, respectively. The contrast amid the average gains of both groups is 4.86. This signifies that there is a distinction of 4.86 amid the average achievement scores of students instructed in biology using assisted discovery and showcase approaches, favoring the assisted discovery practice.

Hypothesis Three (HO₃)

There is no notable contrast in the average achievement scores among students instructed in the biology curriculum using assisted discovery and showcase approaches.

Table 6

Summary of Independent Samples t-test Contrast of Pre-Test Average (\bar{x}) Achievement Scores of Students Imparted Biology Using Assisted Discovery and Showcase approaches

Group	N	Pre-test		Df	t-cal	sig. (2-tailed)	Remark
		(\bar{x})	SD				
Assisted Discovery	175	16.21	5.63	359	0.835	0.404	Not remarkable
Demonstration	186	16.70	5.71				

P > 0.05

Table 6 signposts that there is an inremarkable disparity in the pre-test average achievement scores amid students instructed in biology using assisted discovery and showcase approaches ($t_{cal} = 0.835$, $P(0.404) > 0.05$). Based on this outcome, HO₃ was assessed using an independent samples t-test.

Table 7

Summary of Independent Samples t-test Contrast of Post-Test Average (\bar{x}) Achievement Scores of Students Imparted Biology Using Assisted Discovery and Showcase approaches

Group	N	Post-test		Df	t-cal	sig. (2-tailed)	Remark
		(\bar{x})	SD				
Assisted Discovery	175	62.11	13.93	359	3.970	0.000	HO ₃ is rejected
Demonstration	186	56.76	11.63				

P < 0.05

Table 7 reveals a noteworthy contrast in the post-test average achievement scores amid students instructed in biology using assisted discovery and showcase approaches ($t_{cal} = 3.870$, $P(0.000) < 0.05$). Consequently, the rejection of HO₃ is warranted. Hence, a substantial distinction exists in the average achievement scores among students imparted biology using assisted discovery and showcase approaches, with those instructed via assisted discovery achieving higher scores contrast to their equivalents imparted with the showcase approach.

Research Question Four

What is the contrast in the average enthusiasm scores among students imparted biology with assisted discovery and showcase approaches?

Table 8

Average (\bar{x}) and St.d (SD) of Pre-Test and Post-Test Enthusiasm Scores of Students Imparted Biology Using Assisted Discovery and Showcase approaches

Group	N	Pre-test		Post-test		Average Gain (MG)	Contrast in MG
		(\bar{x})	SD	(\bar{x})	SD		
Assisted Discovery	175	24.28	8.37	61.23	6.77	36.95	0.77
Demonstration	186	23.40	5.39	61.12	9.22		

Table 8 outlines a pre-test average (\bar{x}) enthusiasm score of 24.28, with a st.d (SD) of 8.37, for students instructed in biology using the assisted discovery practice. In contrast, students imparted with the showcase approach exhibited a pre-test average (\bar{x}) enthusiasm score of 23.40, with a st.d (SD) of 5.39. In the post-test, students in the assisted discovery group attained an average (\bar{x}) enthusiasm score of 61.23, with a st.d (SD) of 6.77, while their equivalents in the demonstration group achieved a average (\bar{x}) enthusiasm score of 61.12, with a st.d (SD) of 9.22. The average (\bar{x}) gain for assisted

discovery and showcase approaches is 36.95 and 37.72, respectively. The contrast amid the average gains of both groups is 0.77. This designates that there is a distinction of 0.77 amid the average enthusiasm scores of students instructed in biology using assisted discovery and showcase approaches, favoring the showcase approach.

Hypothesis Four (HO₄)

There is no noteworthy contrast in the average enthusiasm scores among students instructed in the biology curriculum via assisted discovery and showcase approaches.

Table 9

Summary of Independent Samples t-test Contrast of Pre-Test Average (\bar{x}) Enthusiasm Scores of Students Imparted Biology Using Assisted Discovery and Showcase approaches

Group	N	Pre-test		Df	t-cal	sig. (2-tailed)	Remark
		(\bar{x})	SD				
Assisted Discovery	175	24.28	8.37	359	1.198	0.232	Not remarkable
Demonstration	186	23.40	5.39				

P > 0.05

Table 9 signposts an inremarkable discrepancy in the pre-test average enthusiasm scores amid students instructed in biology using assisted discovery and showcase approaches (tcal = 1.198, P(0.232) > 0.05). Given this outcome, HO₄ was assessed using an independent samples t-test.

Table 10

Summary of Independent Samples t-test Contrast of Post-Test Average (\bar{x}) Enthusiasm Scores of Students Imparted Biology Using Assisted Discovery and Showcase approaches

Group	N	Post-test		Df	t-cal	sig. (2-tailed)	Remark
		(\bar{x})	SD				
Assisted Discovery	175	61.23	6.774	359	0.129	0.898	HO ₆ is not rejected
Demonstration	186	61.12	9.217				

P > 0.05

Table 10 signposts that there is no noteworthy distinction in the post-test average enthusiasm scores amid students instructed in biology using assisted discovery and showcase approaches (tcal = 0.129, P(0.129) > 0.05). Based on this result, HO₄ remains unchallenged. Consequently, there is no substantial contrast in the average enthusiasm scores among students imparted biology using assisted discovery and showcase approaches.

Discussion of Findings

The findings of the enquiry are discussed as follows:

Effects of Assisted Discovery and Showcase approaches on Achievement

The enquiry demonstrated a noteworthy bearing of assisted discovery and showcase approaches on students' average achievement scores in biology, indicating an enhancement in academic performance when employing these teaching approaches.

Upon comparing the average contrasts amid students instructed in biology using assisted discovery and showcase approaches, a remarkable disparity in average achievement scores emerged. Students imparted with assisted discovery exhibited higher average scores contrast to their equivalents imparted via the showcase approach. This observation suggests that assisted discovery may have stimulated greater student commitment during instruction contrast to the showcase approach. The active involvement encouraged by assisted discovery facilitated a deeper analogues of concepts, leading to improved retention and applicability of biology knowledge. This aligns with Inyang's (2022) findings, reporting a remarkable contrast in average achievement scores among physics students imparted waves using various instructional practices, with assisted discovery and showcase approaches proving effective. Similar support is found in Nbina's (2013) research, indicating the superiority of assisted discovery over demonstration in augmenting cognitive achievement in chemistry for all tiers of evidence-based literacy students. Additional studies by Garuma and Tesfaya (2012), Datom (2015), and Udo (2010) further affirm the efficacy of assisted discovery in augmenting students' achievement contrast to the showcase approach.

Contrastingly, Uwak and Stephen (2020) presented conflicting results, asserting that the showcase approach surpasses assisted discovery in augmenting students' achievement.

Effects of Assisted Discovery and Showcase approaches on Enthusiasm

The enquiry uncovered a remarkable bearing of both assisted discovery and showcase approaches on students' average enthusiasm scores in biology. The applicability of these practices resulted in a positive change (the contrast amid post- and pre-test average enthusiasm scores) in the average enthusiasm scores for students in both groups. This suggests that students achieved higher post-test enthusiasm scores contrasts to their pre-test scores due to exposure to treatment using assisted discovery and showcase approaches, indicating a positive effect on students' enthusiasm in biology.

Furthermore, the enquiry contrastd the effects of both assisted discovery and showcase approach on students' average enthusiasm scores in biology. The findings signposted an unremarkable contrast in average enthusiasm scores among students instructed in biology expending assisted discovery and showcase approaches. This infers that the usage of the assisted discovery practice enhances students' enthusiasm in biology to a similar degree as the showcase approach. This observation may be ascribed to the fact that both assisted discovery and showcase approaches equally evoke, capture, and sustain students' enthusiasm in biology during the teaching-mastery process, resulting in the absenteeism of a remarkable contrast in average enthusiasm scores for students imparted biology via assisted discovery and showcase approaches.

However, contrasting views exist in the research studies of Eze, Ezenwafor, and Onwusa (2020) and Saira and Mohammed (2021), which assert that the showcase approach is more actual in augmenting students' enthusiasm. Conversely, Agu and Samuel (2018) and Olajide and Adewole (2020) contend that the assisted discovery practice is grander to the showcase approach in promoting students' enthusiasm.

Conclusion

Based on the enquiry's findings, the conclusion drawn is that assisted discovery proves to be more operational in fostering students' achievement, although both practices contribute to an improvement in students' enthusiasm in biology.

Recommendations

The enquiry offers the following recommendations:

1. Biology instructors at the secondary school tier should embrace the assisted discovery practice for instructing biology.
2. Schools are invigorated to promote the adoption of both assisted discovery and showcase approaches, given their positive bearing on students' enthusiasm in biology.
3. Government bodies and school administrators are urged to support and advocate for the enactment of the assisted discovery practice in educational institutions.
4. Organizing workshops, conferences, and seminars is recommended to provide instructors with insights and training on the effective applicability of the assisted discovery practice in schools.

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