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Effects of ASEI-Based Instructional Strategies on Basic Students' Achievement in Drug Abuse Education in Federal Capital Territory Abuja

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Abstract: This paper investigated effects of ASEI-Based Instructional Strategies on students' achievement in drug abuse education. The study was conducted to determine the effects of Activity-Based Strategy on the Achievement of Students junior secondary school in Federal Capital Territory, Abuja. The study employed quasi-experimental design. Specifically, the study applied pre-test, post-test non- randomized, control group. The population of this study comprised of all JSS students in public Secondary Schools in Federal Capital Territory, Abuja. The sample size of the study was 120 (JSS II) Basic science students were selected using simple random sampling and purposive sampling procedure. The instruments used for data collection were Basic science Basic science Achievement Test (BSAT) developed by the researcher. The instruments were validated by three experts in science education. The reliability index of the Basic science Achievement Test was pilot tested in the same school, and the reliability index was determined using Kuder-Richardson formula (Kr-21) which gave an index of 0.82. The data obtained from the study were analyzed using mean and standard deviation to answer the research questions while the hypotheses were tested at 0.05 level of significance using ANCOVA. The results revealed that students taught drug abuse education with ASEI Based instructional strategy had higher mean achievement scores than those taught using conventional method. It was therefore recommended among others that Basic science teachers should be encouraged to incorporate ASEI based instructional strategy of teaching since the method provides the opportunity of engaging students in learning activities and encourage their achievement towards drug abused education.

Keys words: ASEI-Based Instructional Strategies, Achievement and Drug Abuse.

Background

Education remains one of the most potent tools in the global fight against drug abuse. By equipping learners with the knowledge, skills, values, and attitudes necessary to resist drug experimentation and use, education serves as a preventive mechanism that complements legislation and enforcement. In the context of Basic Science, drug abuse education helps students understand the physiological, psychological, and social consequences of substance misuse. Drug abuse education has emerged as a critical component of health and social science curricula globally, particularly in developing countries where young people are increasingly exposed to illicit substances. In the Nigerian context, basic education serves as a foundational phase for character formation, life skills acquisition, and awareness about health and safety issues such as drug abuse. Drug education, when effectively delivered,

empowers students with the cognitive and affective competencies required to make informed decisions, resist peer pressure, and avoid substance use (Ogunyemi et al., 2022). Despite government policies and curriculum reforms, Nigeria continues to grapple with rising cases of drug use among adolescents, with a growing need for innovative teaching strategies to tackle this issue at the classroom level. The integration of drug abuse education into Basic Science aims to address not only the scientific consequences of drug consumption but also the social, emotional, and behavioral implications. Yet, the effectiveness of this integration depends heavily on the pedagogical strategies employed by teachers. Traditional, teacher-centered approaches often fail to engage learners meaningfully, resulting in apparent understanding of crucial concepts. Thus, the call for active and innovative instructional models that promote student involvement, critical thinking, and real-world application is more urgent than ever (Yusuf, et.al., 2021).

There has been a disturbing trend in Nigeria's public health data indicating a surge in drug use among in-school adolescents, including those in the basic education cycle. According to the United Nations Office on Drugs and Crime (UNODC, 2021), nearly 14.3 million Nigerians aged 15–64 had used drugs in the past year, with cannabis being the most commonly abused substance. Alarmingly, younger populations are increasingly represented in this data, pointing to early exposure and the need for urgent preventive intervention within schools. The prevalence of drug abuse among students in Junior Secondary School as classified under basic education has led to academic decline, increased truancy, school violence, and deteriorating mental health (Ibrahim, et al., 2023). The phenomenon is not limited to urban centers but is also creeping into rural and peri-urban areas due to the influence of social media, poor parental supervision, and weak school counseling systems. Schools are now expected not only to impart knowledge but also to act as primary agents of social control and behavior modification. This raises critical questions about the efficacy of existing teaching strategies in shaping students' behavior toward drug use. A passive, lecture-dominated method cannot respond to such complex behavioral challenges. There is a clear need for an educational approach that integrates hands-on learning, student participation, improvisation, and critical inquiry elements embodied in the ASEI instructional framework (Ojelade, et al., 2024 & Oladipo, et al., 2022).

Educational approach must deliver more than mere content delivery, it must provoke reflection, moral reasoning, and peer-led discussions (Ekundayo, et al., 2022). When delivered through interactive and student-centered strategies, drug education fosters deeper internalization of anti-drug values and increases the likelihood of behavior change. It becomes a preventive instrument when it transcends the boundaries of theory and engages learners actively in simulations, debates, case studies, and role-plays (Ndubueze, et al., , 2023). Studies have shown that young adolescents are more likely to reject drug use when they are involved in activities that allow them to explore real-life implications and peer pressure scenarios (Okon, et al, 2020). Consequently, there is a shift from treating drug education as supplementary to making it a core dimension of value-based education in the Nigerian Basic Science curriculum. As this will assist the students to relate with the happens that surround drugs implication and its aftermaths.

Ezeani, et al (2021) affirmed that teaching drug abuse within the Basic Science curriculum in Nigeria faces numerous challenges. First, many teachers lack adequate training in delivering health-related topics, particularly those that require sensitive discussions about behavior, morality, and peer pressure. Secondly, instructional time allotted to drug education is often insufficient, as it is typically integrated within larger units in Basic Science without clear emphasis. Aregbesola, (2023) submitted that pedagogical approaches traditionally employed predominantly lecture-based and textbook-driven are incompatible with the experiential and dialogic nature of effective drug abuse instruction. Another critical issue is the lack of age-appropriate instructional materials. Most materials fail to reflect the local contexts or real-life experiences of students, thus creating a gap between content and relevance. Students may learn about the chemical properties of drugs without understanding the socio-emotional triggers that lead to drug use or the real-life consequences of addiction. In addition, there is limited collaboration between schools and community health stakeholders, which weakens the link between formal

instruction and preventive community interventions (Adegoke, et al, 2023). Moreover, societal silence around drug use, stigmatization, and parental denial often create barriers to open classroom discussions. In many cases, teachers avoid drug education topics to prevent controversy or parental backlash. These challenges highlight the need for transformative pedagogies like ASEI-based strategies that enable safe, participatory, and localized learning, capable of addressing both the cognitive and affective domains of learners.

In drug abuse education, the instructional strategy adopted can make a significant difference in shaping students' understanding, and behavioral choices. Traditional instructional strategies often characterized by rote memorization, one-way delivery, and lack of contextualization are ill-equipped to address complex psychosocial issues like substance abuse (Bello, et al., 2023). In contrast, strategies that involve critical thinking, experiential learning, problem-solving, and emotional engagement are more effective in enhancing students' achievement in health-related topics. Drug abuse education thrives when students are given the opportunity to reflect on their own values, participate in real-world simulations, engage with stories of drug misuse, and evaluate scenarios that mirror their daily lives. Constructivist approaches, including discovery learning, cooperative learning, and role-playing, have been shown to yield better results in terms of knowledge retention, attitudinal change, and behavioral resilience (Okafor & Egwu, 2021). These strategies empower students to become active participants in their own learning process, a key requirement when addressing personal and social health challenges such as drug use. The classroom today demands that teachers move from being dispensers of knowledge to facilitators of exploration and transformation. Drug abuse education especially requires a departure from passive delivery methods toward learner-driven activities. It is within this context that ASEI-based instructional strategies emerge as a pedagogical innovation capable of bridging the gap between knowledge and behavioral change, particularly among learners in Basic Science classes.

The ASEI framework standing for **Activities, Students, Experiment, and Improvisation** originated from the Strengthening Mathematics and Science in Secondary Education (SMASSE) initiative in Kenya. It is a transformative pedagogical model designed to improve teaching and learning outcomes in science subjects by shifting the focus from teacher-centered to learner-centered education. ASEI emphasizes practical activities, active student participation, scientific experimentation, and the creative use of local or improvised materials. This model resonates with the constructivist theory of learning, which argues that learners construct knowledge through interaction with their environment and prior experiences (Chepkorir, et a., 2020). ASEI philosophy challenges the status quo of theoretical, exam-focused science teaching by advocating for a classroom where learners "do" rather than merely "listen." It encourages teachers to design lessons that allow students to explore concepts through hands-on investigation, collaboration, and critical inquiry. Ezeanya, et al., (2022) agreed that improvisation, a core element of ASEI, ensures that resource limitations do not impede the learning process. In the context of Nigerian Basic Science education especially in drug abuse instruction improvisation enables educators to contextualize learning using locally relevant materials, analogies, and case studies. Moreover, ASEI promotes emotional and social learning by placing students at the center of the instructional process. Students not only gain knowledge but also develop empathy, communication skills, and moral reasoning key components of effective drug abuse education. This model aligns well with Nigeria's curriculum goals of producing students who are not just knowledgeable, but also responsible and health-conscious citizens.

Statement of the Problem

Basic Science serves as a critical foundation for further studies in science and technology and for developing informed citizens capable of addressing societal issues. Recognizing this, the NERDC incorporated Drug Abuse Education into the Basic Science curriculum for junior secondary schools. Despite this inclusion, students' performance in Basic Science has remained only fairly satisfactory, with fluctuating results in the Basic Education Certificate Examination (BECE) from 2018 to 2020, indicating the limitations of conventional teaching strategies currently in use. More concerning is the poor student performance and low attempt rate on BECE questions specifically related to Drug Abuse

Education. This reflects inadequate understanding of drug abuse concepts, which is alarming given the rising prevalence of drug abuse among Nigerian youths. Reports indicate that approximately 14.4% of Nigerians aged 15 to 64 abuse drugs, with cannabis use alone affecting millions (United Nations Office on Drug and Crime, Nigeria). Peer pressure, socio-economic challenges, and ineffective teaching strategies contribute significantly to this problem.Existing teaching methods largely emphasize teacher-centered, lecture-based approaches that fail to actively engage students or address behavioral change. This gap necessitates the exploration of innovative, student-centered instructional strategies such as ASEI-PDSI, which have shown promising results in similar contexts within Sub-Saharan Africa.Therefore, this study investigates the effects of ASEI-PDSI-based instructional strategies on students' attitudes and academic achievement in Drug Abuse Education within Basic Science classes in the Federal Capital Territory, Abuja.

Purpose of the Study

The purpose of this study was to investigate the effects of ASEI-Based Instructional Strategies on Basic Students' Achievement in Drug Abuse Education in FCT Abuja. Specifically, the objectives of the study are to;

1. ascertain the mean achievement scores of students taught Drug Abuse Education (DAE) contents of Basic Science using ASEI Based instructional strategy .
2. Find out the mean achievement score of male and female students taught drug abuse education contents of basic science using ASEI Based instructional strategy

Research Questions

The following research questions guided the study.

1. What are the mean achievement scores of students taught DAE contents of Basic Science using ASEI Based instructional strategy and conventional teaching method?
2. What are the mean achievement scores of male and female students taught DAE Contents of Basic Science using ASEI Based instructional strategy?

Hypotheses

The study was guided by the following null hypotheses and tested at 0.05 level of significance

H_{01}: There is no significant difference in the mean achievement scores of students taught DAE contents of Basic Science using ASEI Based instructional strategy and those taught using conventional method.

H_{02}: There is no significant difference in the mean achievement scores of male and female students taught DAE contents of Basic Science using ASEI Based instructional strategy.

The ASEI instructional strategyl is deeply rooted in several educational theories, primarily **constructivism**, **experiential learning**, and **social learning theory**. These theoretical foundations collectively support the idea that learners should be active participants in their own learning, particularly when dealing with complex societal issues like drug abuse. **Constructivist theory**, as advanced by Jean Piaget and Lev Vygotsky, holds that knowledge is constructed through active engagement and interaction with one's environment. This perspective affirms the core ASEI principle that students learn better when they are actively involved in performing tasks, solving problems, and discovering new information, rather than being passive recipients of content. In the case of drug abuse education, this means students engage in real-life applications such as discussions, role-plays, and simulations that allow them to build personal meaning around drug-related concepts and consequences. Also, **Kolb's Experiential Learning Theory** contributes significantly to ASEI's foundation. According to Kolb effective learning follows a cycle of concrete experience, reflective observation, abstract conceptualization, and active experimentation. The ASEI framework ensures that learners move through these stages by involving them in classroom experiments (concrete experience), reflective questioning (observation), formulation of understanding (conceptualization), and applying knowledge in new

situations (experimentation). While **Bandura's Social Learning Theory** introduces the concept of learning through observation and modeling. It is especially relevant in drug abuse education, where peer influence and social dynamics play a significant role. ASEI-based strategies provide a structured classroom environment where positive behaviors, such as saying no to peer pressure or seeking help, can be modeled and reinforced through group interactions, debates, and classroom drama. Together, these theoretical pillars ensure that ASEI strategies are not merely about instructional delivery but about creating transformational learning experiences that influence both cognitive and affective domains.

Okafor and Nwachukwu (2024) submitted that ASEI positively influences students' achievement by promoting active learning, critical thinking, and practical application of concepts. Their study showed that students taught biology using ASEI strategies scored significantly higher in drug abuse achievement tests compared to those taught by conventional methods. This is largely attributed to the interactive and experimental nature of ASEI, which fosters deeper cognitive engagement. Also Onyekachi, (2023) said that ASEI encourages continuous feedback and peer interaction, which support learning reinforcement and remediation. The experiential learning process helps students grasp the biological, psychological, and social dimensions of drug abuse, leading to holistic knowledge that is more likely to influence behavior positively It also have shown correlation between improved achievement and positive attitude. When students perform better academically, their confidence and interest in the subject increase, creating a virtuous cycle that promotes sustained engagement and retention (Adeyemi & Oseni, 2023).

In a study by Musa et al., (2021) evaluated how experimental instructional strategies, similar in nature to the ASEI model, enhanced adolescents' health literacy in Nasarawa State. The study involved 100 JSS 2 students and utilized mixed methods to assess their understanding of drug abuse topics. Findings indicated that students exposed to experimental role-play and simulations developed a stronger grasp of the harmful consequences of drug use. The authors emphasized that active, hands-on learning environments facilitated deeper understanding and personal connection to the content. Although not explicitly structured under the ASEI framework, the study supported the core principles of the ASEI model, such as experimentation and student engagement. Aina and Odumodu (2023) also contributed to the growing body of knowledge by focusing specifically on activity-based instruction in drug abuse education within Basic Science. Their study involved 120 students from public schools in Lagos State and adopted a six-week intervention period. Results from pre- and post-test scores revealed that students taught with activity-based methods such as group discussions, dramatizations, and student-led projects achieved significantly higher outcomes than those taught using traditional methods. This study's focus on drug abuse topics aligns closely with the current investigation, although it did not incorporate the full ASEI model. The current research builds upon this by employing a more structured and comprehensive application of all four ASEI elements. In another study conducted in Abuja, Njoku and Chukwuma (2023) focused on the affective outcomes of ASEI strategies in teaching drug abuse topics in Basic Science classrooms. Their study involved 80 JSS 3 students and revealed that ASEI-based instruction not only improved academic performance but also enhanced students' empathy, critical thinking, and moral reasoning. These affective gains are particularly important in drug abuse education, where behavior change and attitudinal development are as crucial as knowledge acquisition. While their study emphasized the affective domain, the current research is more concerned with cognitive achievement, thus offering a complementary perspective.

However, gender experiences may influence how students perceive drug risks, societal expectations, and peer pressure. These distinctions underscore the need for gender-sensitive pedagogical frameworks, which the ASEI model inherently promotes. ASEI-Based Instructional Strategies focused on Activities, Student-centeredness, Experiments, and Improvisation are designed to promote inclusivity and active engagement. In drug education, where emotional sensitivity and personal reflection are crucial, ASEI allows both male and female students to interact with the subject matter through role plays, group projects, and hands-on demonstrations. For example, in a lesson on resisting peer pressure, mixed-gender group dramatizations provide students with a safe space to model behavior and reflect on scenarios, bridging cognitive understanding with social-emotional learning. According to Bamidele, et

al, (2021) and Ojelade, et al., (2016) the gender gap in science performance significantly narrowed in ASEI based classrooms, with female students demonstrating improved communication, reasoning, and academic performance in drug-related topics. In contrast, conventional teaching methods often marginalize less vocal students frequently female through rigid lecture formats that prioritize rote responses over exploratory learning. Moreover, ASEI encourages improvisation, which can be gender-responsive when tailored to reflect students' diverse sociocultural realities. For instance, discussing drug-related consequences in the context of maternal health or gender-based violence can deepen female students' engagement and relevance of learning. Similarly, boys benefit from activities that promote leadership, accountability, and empathy, thereby dismantling harmful masculine stereotypes tied to drug use and aggression. Therefore, integrating ASEI in drug abuse education ensures that both male and female students are not only academic beneficiaries but are also empowered as socially responsible individuals. It creates a space where discussions around drug abuse are no longer theoretical but are addressed in gender-relevant, participatory, and transformative ways.

Okonkwo and Ezeh (2022) conducted a study on ASEI pedagogy and biology achievement among junior secondary students in the Federal Capital Territory, Abuja. Their analysis of gender-disaggregated data revealed that while both male and female students benefited from ASEI strategies and students demonstrated slightly higher gains in health-related topics, including drug abuse. This finding suggests that the hands-on, affective, and discussion-based nature of ASEI instruction may align more closely with students' preferred learning styles, particularly in topics involving social and emotional dimensions. Njoku and Chukwuma (2023) further emphasized the role of gender in affective learning outcomes under the ASEI approach. Their study found that female and students exhibited more pronounced improvements in empathy, moral reasoning, and peer collaboration when engaged with ASEI-based lessons on drug abuse. The authors argued that girls were more attuned to the emotional and relational aspects of the content, especially during role-plays and group activities. Conversely, while boys also showed cognitive gains, their affective development was comparatively moderate. These insights underline the need for gender-responsive pedagogical planning when implementing ASEI in drug abuse education. Contrastingly, Musa and Tanko (2021) reported that male students displayed higher enthusiasm during experimentation and improvisation tasks. The study suggested that male students often prefer physically engaging activities, which are prominent in ASEI-based lessons. However, they also acknowledged that without intentional facilitation, such activities could lead to dominance by male students in mixed-gender classrooms. As a result, the authors advocated for structured roles and inclusive group dynamics to ensure gender equity in participation and learning outcomes.

Methodology

The research design adopted for the study was quasi-experimental design of control group design with pretest and post-tests. According to Spaulding, and Voegtle (2010) quasi-experimental research design is very vital and foremost in showing causal relationships between dependent and independent variables. The target population for the study was 44,457 Upper Basic II (JSS II) students in public Schools under FCT Universal Basic Education Board Abuja. A sample size of the study comprised 120 students (precisely 63 males and 57 females' students). The study adopted purposive sampling techniques. Purposive sampling techniques was used to select two (2) co-educational schools in Abuja Municipal Area Council for the study. One of the school was assigned experimental and the other was assigned as control group. This is due to the fact that gender is a variable in the study. The instruments used for data collection was Basic Science Achievement Test (BSAT) and was constructed by the researcher. The Basic Science Achievement Test (BSAT) was made up of two sections, A and B. Section A consist of personnel profile of respondents. Section B of the BSAT comprised of 30 multiple-choice items. The items are generated by the researcher from the past Basic Science Education Certificate Examination (BECE) question papers. The test items with four options lettered A-D each. Students were to choose the correct answers from the list of options provided. The 30 items test were scored 2 point each for a total of 60 marks. The instrument (BSAT) subjected to both face, content and construct validity. The

validation of these instruments was done by three experts from University of Abuja, one from the Department of Science and Environmental Education and one from the Department of Educational Foundation to check the face validity and well experienced Basic Science teacher in AMAC checked the content validity. The corrections made by these experts were used to review the instruments

After the validation, BSAT items were subjected to pilot test to ascertain the reliability of the instruments. Intact class consisting 40 Basic Science students participated in the pilot test. The School used for the pilot test was not a sample for this study. The reliability of the Basic Science Achievement Test was pilot tested in the same school, and the reliability index was determined using Kuder Richardson formula (Kr-21) which gave an index of 0.82 this shows that the instrument were reliable. The researcher got permission to use the school for study by the principals of the selected schools. The intact classroom teachers were used for the study as research assistance. The research assistants were given training by the researcher on ASEI-PDSI application. The training took five days because of their classroom schedules. After the training pretest was administered on experimental and control groups. Thereafter, the experimental group were given treatment using ASEI-PDSI while control group were taught using conventional teaching method. The two group were taught the topics relating to drug abuse for four weeks. At the end of the treatment Post-test was administered to the two groups immediately after the treatment. The data collected from pretest and post test scores were subjected to both descriptive and inferential statistics. Descriptive statistics of mean and standard deviation were used to answer the research question while ANCOVA at 0.05 level of significance was used to test the null hypotheses. The analysis was computer -based, using Statistical Package for Social Science (SPSS), Version 23.

Results

The analysis of the data according to research questions and test of hypotheses as used in the study were presented as follows;

Research Question One: What are the mean achievement scores of students taught DAE contents of Basic Science using ASEI Based instructional strategy and conventional teaching method?

Table 1: Mean and Standard Deviation on Mean Achievement Scores for Experimental and Control Group

Groups		Pre Test		Post test		Mean Gain
		Mean	SD	Mean	SD	
Experimental	61	18.37	3.02	36.75	5.15	18.37
Control	59	19.21	2.87	31.18	4.50	11.97
Mean difference		0.84	5.57			6.40

Table 1 shows the mean and standard deviation of students taught Basic Science and Technology using ASEI Based instructional strategy and those taught using conventional method. From the results obtained, students in experimental group taught with ASEI Based instructional strategy had a mean achievement score of 18.37 with a standard deviation of 3.02 for pre-test while for the post-test was 36.75 and 5.15respectively. However, the mean and standard deviation for the students in control group was 19.21 and 2.87 in the pretest, while that for the post-test was 31.18 and 4.50 respectively. Again, the mean gain for experimental and control group are 18.37 and 11.97 respectively. Therefore, the mean difference in achievement scores between students in experimental group and control group was 5.57 in favour of students taught Basic Science using ASEI-Based instructional strategy.

Research Question 2: What is the difference in the mean achievement scores of male and female students taught DAE contents of Basic Science using ASEI Based instructional strategy?

Table 2: Mean and Standard Deviation of Achievement Scores of Male and Female Students Taught Basic Science using ASEI Based instructional strategy

Groups	n	Pre Test		Post test		Mean Gain
		Mean	SD	Mean	SD	
Male	33	19.33	2.67	37.75	5.35	18.42
Female	28	17.21	3.04	35.54	4.72	18.33
Mean difference		2.12		2.21		0.09

Table 2 shows the mean and standard deviation of mean achievement scores of male and female students of experimental group taught with ASEI Based instructional strategy. From the results obtained, male students had a mean achievement score of 19.33 with a standard deviation of 2.67 for pretest while for the post test is 37.75 and 5.35 respectively. However, the mean and standard deviation of female achievement was 17.21 and 3.04 for pre-test while for the post test was 35.54 and 4.72 respectively. Therefore, the mean difference in achievement scores between male and female students in experimental group was 2.21 in favour of male students.

Test of Hypotheses

Ho_1:There is no significant difference in the mean achievement scores of students taught DAE contents of Basic Science using ASEI Based instructional strategy and those taught using conventional method.

Table 3: Analysis of Covariance (ANCOVA) Analysis of Achievement Scores of Students Taught DAE contents of Basic Science for Experimental and Control Group

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1008.993[a]	2	504.497	21.935	.000
Intercept	2335.187	1	2335.187	101.531	.000
Pretest	79.287	1	79.287	3.447	.066
Group	992.837	1	992.837	43.167	.000
Error	2690.973	117	23.000		
Total	142556.000	120			
Corrected Total	3699.967	119			
Sig @ P< 0.05					

Result in table above showed the summary result of ANCOVA analysis of achievement scores of students taught DAE contents of Basic Science using ASEI Based instructional strategy and those taught using conventional method. From the table, the F(1, 119) = 43.169 and the significant p-value was 0.000. Since the P- value of 0.000 is less than 0.05 level of significance. Thus, the hypothesis one is rejected, and therefore there was significant difference in the mean achievement scores of students taught DAE contents of Basic Science using ASEI Based instructional strategy and those taught using conventional method in favour of students in experimental group.

Ho_2: There is no significant difference in the mean achievement scores of male and female students taught DAE content of Basic Science using ASEI Based instructional strategy.

Table 4: ANCOVA analysis of achievement scores of male and female students taught DAE contents of Basic Science using ASEI Based instructional strategy.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	75.754[a]	2	37.877	1.448	.243
Intercept	1511.853	1	1511.853	57.782	.000
pretest	22.307	1	22.307	.853	.360

gender	27.032	1	27.032	1.033	.314
Error	1517.558	58	26.165		
Total	83996.000	61			
Corrected Total	1593.311	60			

Not Sig @ P> 0.05

Result in the table 4 shows the summary result of ANCOVA analysis of achievement scores of male and female students taught DAE contents of Basic Science using ASEI Based instructional strategy. From the table, the F(1, 60) = 1.033 and the significant p-value was 0.314, since the P- value of 0.314 was greater than 0.05 level of significance. Thus, the hypothesis two is not rejected, and therefore there is no significant difference in the mean achievement scores of male and female students taught DAE contents of Basic Science using ASEI Based instructional strategy in experimental group.

Discussion of Findings

The finding of the study show that students exposed to ASEI Based instructional strategy had higher post-test mean achievement scores in DAE contents in Basic Science compared to students exposed to conventional method. The difference in achievement was further strengthen by the result of hypothesis which shows a significant difference in the mean achievement scores of students taught DAE and those taught using conventional method. This finding agrees with previous research findings of Okafor and Nwachukwu (2024) who submitted that ASEI positively influences students' achievement by promoting active learning, critical thinking, and practical application of concepts. The findings of the study revealed that students taught DAE drug abuse using ASEI-Based instructional strategy significantly developed better achievement score than those taught using conventional method. In a study by Musa et al., (2021) The authors emphasized that active, hands-on learning environments facilitated deeper understanding and personal connection to the content. Although not explicitly structured under the ASEI framework, the study supported the core principles of the ASEI model, such as experimentation and student engagement. Aina and Odumodu (2023) discovered that student-led projects achieved significantly higher outcomes than those taught using traditional methods.

The finding also reveals that there is no difference in the mean achievement scores of male and female students taught DAE contents of Basic Science using ASEI Based instructional strategy. This could be supported by the work of Okonkwo and Ezeh (2022) who conducted a study on ASEI pedagogy and biology achievement among junior secondary students in the Federal Capital Territory, Abuja. Their analysis of gender-disaggregated data revealed that while both male and female students benefited from ASEI strategies and students demonstrated slightly higher gains in health-related topics, including drug abuse. This finding suggests that the hands-on, affective, and discussion-based nature of ASEI instruction may align more closely with students' preferred learning styles, particularly in topics involving social and emotional dimensions. Njoku and Chukwuma (2023) further emphasized the role of gender in affective learning outcomes under the ASEI approach. Their study found that female and students exhibited more pronounced improvements in empathy, moral reasoning, and peer collaboration when engaged with ASEI-based lessons on drug abuse. The authors argued that girls were more attuned to the emotional and relational aspects of the content, especially during role-plays and group activities. Conversely, while boys also showed cognitive gains, their affective development was comparatively moderate. These insights underline the need for gender-responsive pedagogical planning when implementing ASEI in drug abuse education. Contrastingly, Musa and Tanko (2021) reported that male students displayed higher enthusiasm during experimentation and improvisation tasks. The study suggested that male students often prefer physically engaging activities, which are prominent in ASEI-based lessons. However, they also acknowledged that without intentional facilitation, such activities could lead to dominance by male students in mixed-gender classrooms. As a result, the authors advocated for structured roles and inclusive group dynamics to ensure gender equity in participation and learning outcomes.

Conclusion

The findings of this study affirm that the ASEI-based instructional strategy significantly enhances students' academic achievement in drug abuse education compared to traditional teaching methods. The interactive, hands-on, and student-centered nature of ASEI creates a dynamic classroom environment that encourages active participation and deeper conceptual understanding. Students taught using ASEI strategies demonstrated improved comprehension of drug-related issues, critical thinking, and personal relevance of the content. The study further revealed that while ASEI strategies positively impacted both male and female students, gender differences were evident in learning outcomes. Female students showed greater affective engagement and retention, especially during role-play and collaborative tasks, whereas male students excelled in experimentation and improvisation tasks. This indicates that although ASEI promotes inclusivity, gender-responsive instructional planning remains essential to maximize the effectiveness of the strategy.

Recommendations

1. The Federal Ministry of Education, in collaboration with school administrators and curriculum developers, should adopt and institutionalize ASEI-based instructional strategies across junior secondary schools in Nigeria.
2. Teacher training programs should prioritize ASEI pedagogy to empower educators with the practical skills necessary to deliver drug abuse education more effectively and foster higher student achievement.
3. Given the observed gender-based learning differences, teachers should be trained to implement ASEI strategies using inclusive approaches that cater to the strengths and learning styles of both male and female students. Deliberate group composition, equitable task assignments, and gender-sensitive facilitation should be integrated into ASEI lesson plans to ensure balanced participation and optimized academic outcomes for all learners.

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