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ASEI-PDSI APPROACH LEVEL OF AWARENESS OF AMONG MATHEMATICS AND SCIENCE EDUCATION STUDENT IN SOKOTO STATE UNIVERSITY

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Abstract

To assess the current level of awareness towards Activity Students Centred and Improvisation Plan Do See Improve ASEI-PDSI Approach among Mathematics and Science Education Student in Sokoto State University the Study designed level of awareness of ASEI-PDSI approach among mathematics and science education student Questionnaire (LAOAMASEQ). The main objective of this study was to expose Mathematics and Science student's teacher to the new approach and assess the level of awareness of ASEI-PDSI Approach and gender disparity. Data were collected from a sample of 217 respondents. From the result, majority of the respondents portrayed very little knowledge about ASEI-PDSI Approach. So also, there is no significant difference between male and Female students with regards to ASEI-PDSI level of awareness among mathematics and Science education students' teachers in Sokoto state university. The findings recommended that the module should be develop for mathematics and Science education students' teacher in tertiary institutions, Government should encourage SMASE INSET and Government should integrate ASEI PDSI approach into teacher education programmes among many more.

Keywords: ASEI PDSI, Awareness, Gender, Mathematics Education, Science Education

Introduction

Mathematics and sciences are very fundamental and crucial subject in the primary, secondary school and tertiary institutions. Despite its reputation; students' achievement and interest are reportedly very low. It is outward worrisome if such is the situation in our schools observing how hard it is to live a meaningful life in the present innovative and creative world without the good knowledge of mathematics and science. The teaching and learning of these subjects, are imperative in every civilisation if the tenants are to cope with the fast-changing development in technology and engineering. Moreover; Mathematics and science are academically stimulating subject that affects every facet of human hustle such as business, politics, engineering and technology (Garba, 2018). The importance of mathematics and science to man has accounted for its inclusion in school curriculum. The significance of mathematics and Science for human lifecycle has crucial value for its presence in school curriculum as an imposed subject for every beginner of school to acquire the appropriate mathematical and scientific skills that will enable him endure with life challenges. With regards to this, the Federal Government of Nigeria

through the National Policy on Education (FGN, 2013) stated that mathematics and basic science should be taught as a core subject to all students at basic and secondary school level in order to give a sound root for scientific and technological thinking skills, and concoct them for the next level of Instruction.

Furthermore, the position of mathematics and science does not only depend on its contributions to scientific and technological development but also in its usefulness to daily interactions at the market places, transportations, business of all sorts by both knowledgeable and common man of the society. Unfortunately and Regrettably, researchers for instance, Hassan & Shahid (2019) and others have shown that students' achievement in these very important subjects (mathematics and science) over the years has not been positive at the basic, secondary and even at tertiary institutions of education in Nigeria. Parents and government are in upset about the current condition of mathematics and science education in Nigeria. This is because a credit pass needed for candidate to be admitted into tertiary institution is in sorry state. As Asikhia (2014) stated, that so many students at tertiary institutions in Nigeria today are not studying the courses they wanted to study because of not making the required SSCE grades in English, Mathematics and science subjects related area to gain admission to courses wanted to study.

According to Morsanyi et al. (2014), students need methods of instruction that are proper for the better emphasis on problem solving, higher order thinking skills and applications. Morsanyi et al furthermore believed that, an instruction modes as cooperative learning that allows students to carry out particular task together in problem-solving circumstances, to pose questions, analyze situations, try different strategies and check for rationality of results are required in teaching and learning process. The teaching of mathematics and science should therefore not be about dispensing rules, definitions and procedures for students to memorize, but engaging students as active participants through various activities, discussion and collaboration among the students (Dangpe, 2015).

The curriculum clearly specifies the use of activity method in the teaching and learning of mathematics and science by providing the performance objectives, content, students and teachers activities as well as teaching and learning materials. On the other way round, the practice by teachers in the Conventional teaching strategy (CTS) does not make reference to these emphasized suggested activities spelt out in the curriculum.

The result as shown by Dangpe (2015); was that students are passive in most of our classroom situations and thus continue to record low achievements in mathematics and science subject. Regardless of the positions, there were no much efforts by researchers to outline the procedures in integrating Activity Student Centred and Improvisation- Plan Do See Improve (ASEI-PDSI) approach into teacher education programme. Garba, (2022) pointed out that most of our teachers are using what we called students cantered learning thereby dominating the classroom and is one of the contributing factors toward low achievement of students' academic performance. This study is therefore attempting to fill that gap, this study also therefore taking a look at Experiment and Improvisation approach with a view to strengthening mathematics and science education.

The ASEI/PDSI Approach is used as a means of instruction in classroom for teaching and learning processes and it is paradigm shift from traditional to activity-based approach and Table 1 is showing the changes from Pre-ASEI/PDSI to ASEI/PDSI, the approach has its principles, guideline and peculiar lesson plan which will be discuss in the training module

Table 1: The changes from Pre-ASEI/PDSI to ASEI/PDSI

PRE-ASEI/PDSI	SMASE ASEI/PDSI Experiences:	After Experience in ASEI PDSI
• Knowledge based teaching • Teacher-centred teaching, chalk and talk mostly • Full rule experimentations	• Attitudinal changes by the individual • PDSI • Pedagogy • Material • Production • Capacity building • INSET	• Learning is student centeredness • Activity-based teaching • Experiment And researches • Improved performance and achievement.

To determining whether it will bring the required improvement in students' achievement and interest in mathematics and science education, This Activity Students centred Experiment and Improvisation approach in Nigeria, has its origin in line with the arrangement between the Federal Ministry of Education. (FME) and Japan International Cooperation Agency (JICA). The Federal Ministry of Education & Japan International Cooperation Agency (2007) pinpoints out that various studies (including the National Assessment of Learning Achievement in 1997, 2001 and 2003) have revealed that students' performance, specifically in primary and secondary mathematics and science education, are very poor. However, In 2005 the Federal Ministry of Education (FME) of Nigeria, in collaboration with Japan International Cooperation Agency (JICA), carryout a baseline study on primary mathematics and science education in three states in Nigeria. The study revealed that schools faced serious challenges in the teaching of mathematics and science: teachers were busy in what we called the "chalk and talk" method of teaching and pupils were passive recipient in most of our classroom situation. From 2007 to this 2024, several attempts were made to cascade circle 1,2,3 and 4 to the primary schools' science and mathematics teachers but were faced with a lot of challenges. Federal and state government were spending huge number of resources to carry out the project and the process are in sorry stage; hence the researchers find it of great important to bridge the gap by integrating the mentioned approach into mathematics education and science education Programmes in sokoto state university, Nigeria

Zalmon & Wonu, (2017) explained that mathematics and Sciences are pre-requisite for giving admission into science related subject and technology-based course in Nigeria. However, the guideline in Nigeria education system for one to be given admission to science related subjects into university must have at least five Credits passes in the science related courses of study with mathematics and English language inclusive. According to national policy on education mathematics and science teachers are expected to used what we called students centred and practical approach in the classroom situation but sorry to say the reverse is the case. The performance of students in mathematics and science has been somewhat unsatisfactory over the years in Nigeria largely in Sokoto State. The external examination bodies the West African Examination Council (WAEC) have repeatedly reported the poor performance of students in mathematics., the annual report of west African examination council (WEAC) of the years; 2013, 2014, 2015, 2016

and 2017 which showed the percentage of students with five credits including mathematics with respective pass credits as 7.12%,7.18%,16.84%,29.37% and 31.85% however the 2022 WEAC Examiners report showed that the students have difficulty in solving mathematical problems that require mathematical geometrical concepts that has to with some activities. However, in science related area the students are facing challenges in some practical related topics. Students' low success levels in mathematics and science have been a worry for a long time in many countries, with Nigeria inclusive. There are a lot of factors said to be affecting success in mathematics and science Birgin et al., (20106) . One of these according to Morsanyi et al. (2014) is the conventional form of teaching mathematics and science which has been recognized as being ineffective and as one of the major factors accountable for the poor performances of students in mathematics and science subject. In addition, among several reasons keen out by different scholars, Siocha & Nyagaka (2021) was of the opinion that, poor learning interest and assimilation of mathematics and scientific thoughts, concepts, principles, methods and teachers' failure to use appropriate and stimulating teaching methods are responsible for students' low achievement in mathematics in Nigeria (still, much attention has been directed towards the study of mathematics at the primary and secondary levels of education as to improve students' achievement and interest) regrettably, this has not given the required result of achievement in our schools. Therefore, the search towards more strategies for improving the teaching and learning of mathematics continues. Obomanu & Adaramola, (2011) noted that there is generally low interest in the study of mathematics and science related disciplines at all levels of education in Nigeria. Obomanu added that in most secondary schools in Nigeria, students absented themselves in mathematics lessons and that those who stay in the lessons pay little or no attention to their teachers. Devine et al., (2012) concluded that the question of how to motivate students in the classroom has become a leading concern for teachers of all disciplines.

Concept of Activity Students Centred Experiment and Improvisation (ASEI) Approach

The Government of Kenya in its vision 2030 has named education as one of the mainstays for engrossing Kenya into a commercial country described by Kwamboka, (2012). Accordingly, that the government faced, 2007) an urgent demand to improve Mathematics and Science Education at primary and secondary levels, to develop human resources needed to support such industrialization. It is in this background that Japan sponsored a project for Strengthening Mathematics and Science Education (SMASE)" for five years from 1998, providing in-service training in mathematics and science in nine selected districts. The phase II of the project was carryout from July 2003 to June 2006 purposely to establish discussion and exchange of ideas between Japanese and Kenyan experts, the project accepted a unique approach. This approach encouraged teachers to carry out an activity and innovative lessons using mathematics and Science experiments and practices. This method of lesson innovation is an experiment and improvisation approach called the ASEI (Activity, Student Centred, Experiment, and Improvisation) approach, aiming at making teaching and learning more student-centred rather than more of teacher centred. The project has also successfully introduced the PDSI (Plan, Do, See and Improve) method, which encourages teachers to constantly fine-tune their curricula according to the students' learning achievement and educational needs with full of experimentation throughout the process of teaching and learning processes. The aspect of Plan, Do, See and Improve (PDSI) follows its literal meaning thus this sums up what Emeji, (2021) says it is synonymous to inductive method, guided discovery, activity

learning, and learner- centre instruction. The discovery method which is tantamount with this approach and is defined as a teaching technique that boosts students to take a more active participation in their learning process by answering a bnchain of questions or solving problems designed to introduce a general concept (Mayer, 2003). Mayer credited Jerome S. Bruner as a highly influential cognitive psychologist, responsible for the development of discovery method into an accepted instructional technique. The discovery method to Bruner is based on the notion that learning takes place through classification and schema formation.

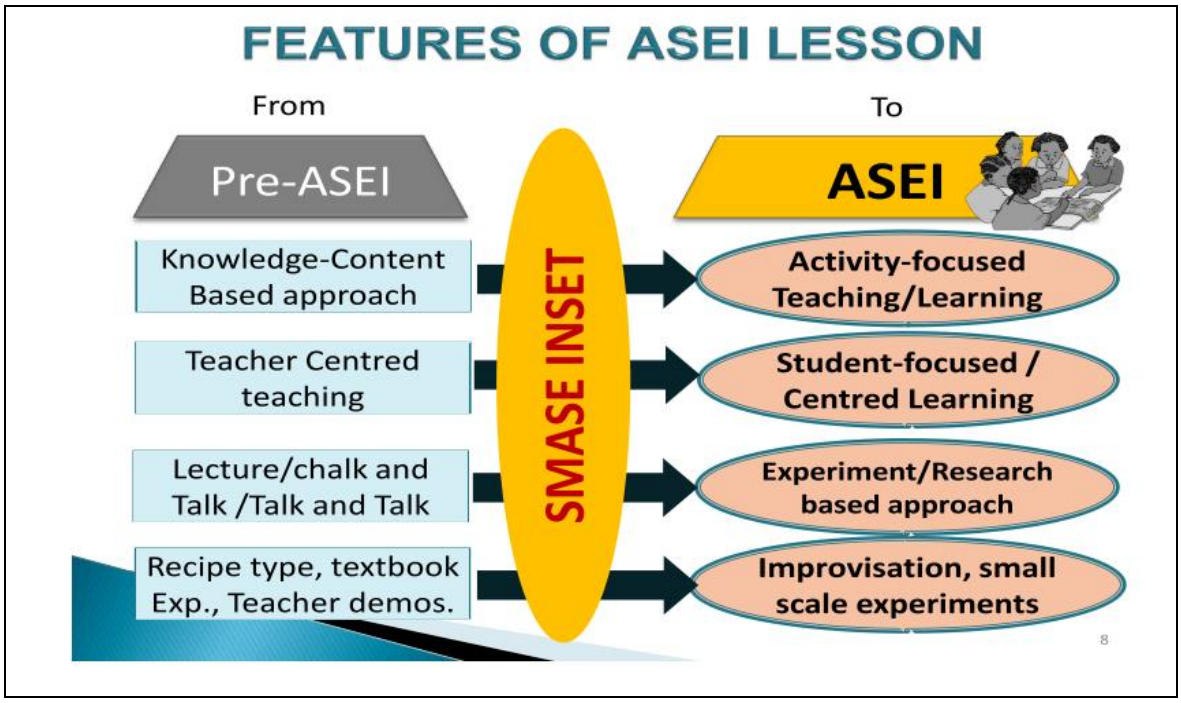

Figure 1: Assessing ASEI lessons (II) (Nicholas, 2013)

The Figure 1 is feature of ASEI lesson gives a diagrammatic summary of the conceptual framework of ASEI from pre-ASEI to the actual ASEI condition as given by Nicholas (2013). In essence, the student becomes active in the learning process while the teacher carefully guides the process.

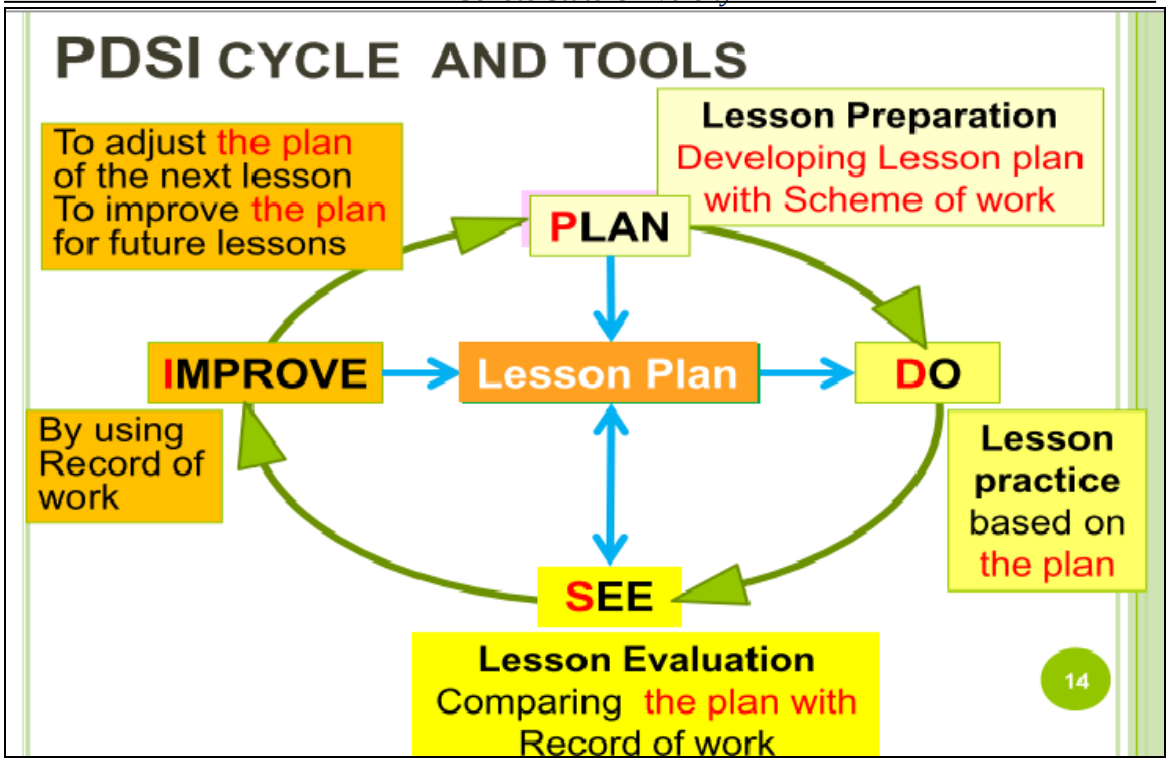

Figure 2: PDSI Cycle and Tools

Figure 2 gives a pictorial illustration of what actually happens during the whole process of lesson preparation and the actual excursion of the lesson process.

Training of mathematics and science education

In the past, great efforts have gone into ensuring qualified teachers and provision of equipment and materials, but in most cases mathematics and science teachers remain inadequate in most African countries. Even where they are adequate, quality of students' achievement in mathematics and sciences education is not always high. It is with this background that the attention is now drawn to what classroom practices, utilization of the available equipment and materials, and approaches and methodologies that are employed in content delivery Siocha & Nyagaka, (2021). This is a critical component to the answer to mathematics and science education problem. This is the basis for the Strengthening Mathematics and Science in Secondary Education (SMASSE) project with an In- Service Education Training (INSET). Teachers remain one of the most important human resources that a country can have. This is because the efficient human capital development depends partly on the quality and effectiveness of the teachers. The quality and effectiveness of the teacher is among others a function of the talent and the training. Additionally, training of teachers is one of the most important aspects of curriculum development and implementation in any education system. Ideally training of teachers should have a pre- service and in-service component.

Teachers' perception on Mathematics and Science subject

Whyte and Anthony (2012) reported that mathematics and science nervousness emanated from the teaching. People generally are anxious before going to schools. The traditional approach to teaching is one of the causes of mathematics and science anxiety (Mutodi & Ngirande, 2014).

According to Finlayson (2014) in a study conducted for pre-service science education teachers, stated that one of the prime factors that contributed towards the students' anxiety is the teacher behavior. Bursal and Paznokas (2006) found that negative attitude towards mathematics and science subject does not affect only mathematics and science education but also engineering and technology. This negative attitude towards mathematics and science subject affects students' ability in solving scientific mathematical problems in chemistry, biology, physics and other related technological and engineering subjects. In the same vein, teachers' in appropriate method of teaching contributed immensely toward the loss of interest in the area of mathematics and science related subject (Geist, 2015). Some pre-service teachers are attributed to poor conception of correct pedagogy to be use in teaching particular topics (Finlayson, 2014). Mathematics and science are an important subject that needs to be given positive perceptions, caring and full involvement of potential mathematics and science teachers showing and exhibiting certain characteristics that will arouse and stimulate the interest in teaching and learning processes. It is known that some regular mathematics teachers experience mathematics anxiety also. Whyte and Anthony (2012) reported subject anxiety emanated from teaching and some believed of the learner. People generally are not mathematics anxious before going to schools. The traditional approach to teaching mathematics is one of the causes of mathematics anxiety (Mutodi & Ngirande, 2014).

As reported by Tobias, Serow & Schmude (2009) Pre-Service, teacher's poor self-conception of themselves as teachers contributes to the massive failure in particular subject. . Instructions need to be given to the learner by the teacher with a higher level of self-conception. In a situation whereby a teacher cannot portray self-conception with concrete realities of subject application, it reinforces the students' perceptions that subject is difficult and it is abstract. There are some topics in mathematics and science which students find difficult to understand such topics create fear and low interest towards the subject (Olubukola, 2015). For some topics in the present secondary schools and tertiary institutions curricula, teachers cannot expose their students to experience it in real life situation outside the schools. Traditionally, students are encouraged to memorize some mathematical and scientific concept without comprehending the real skills and application to a real-life situation (Rossnan, 2006).

In his research Emeji (2021) the result indicated that students in basic science performed significantly better when taught using ASEI-PDSI Approach than when they were exposed to discussion and demonstration methods. He furthermore added that significant difference could be as a result of involvement of students in class work or learning activities which is the child-cantered and participatory aspect of ASEI that leads to constructivism, learning and causes retention in what is learnt.

Level of awareness of ASEI-PDSI

Based on the past research and observation the level of awareness towards Activity Students Centred and Improvisation Plan Do See Improve ASEI-PDSI Approach among Mathematics and Science Education Students reported minimal according to (Katiambo, 2019) there is little knowledge about the concept of ASEI-PDSI approach among mathematics and science.

Learners Gender

Based on the pass research presenting conflicting opinions on gender disparity in mathematics and science subject, this study is to examine whether or not the ASEI-PDSI approach has direct influence on gender with regards to interest and achievement of the learner. According to Jordan, (2017) when the test score data were disaggregated on the base of race and gender, there was no proof of an achievement gap. In another study Teachers' positive attitudes towards male students are a reflection of the broader societal biases about the role of women on the society and the academic capacity of girls (Siocha & Nyagaka, 2021).

Numerous approaches were employed to improve students' performance in school subjects in Nigeria. Based on this the researchers argues that the teaching of mathematics and science could be improved with the use of experiment and improvisation-based approach as ASEI/PDSI approach rather than the conventional teaching strategy. Thus area of mathematics and science could be achieved when an appropriate instructional strategy as the experiment and improvisation based approach is used in teaching and learning where the learners are made to see the importance of what they are about to study. Interest is developed when learning is based on students-centred principles. Some researchers noted that interest has a strong influence on individual's cognitive and affective functioning but the way interest interacts. and through what processes they influence learning has not been clearly established. The researchers remarked that in addition to more standard quantitative and qualitative methodologies, the complexity of academic development in specific domains require the creation of alternative techniques that document and describe the influence of interest on students' learning. Hence, the need to investigate the students' level of awareness on experiment and improvisation-based approach became very important.

Similarly, gender issues are yet inconclusive, gender implication especially as it affects students' achievement and interest in these subjects need more verification. However, the use of experiment and improvisation-based approach found in ASEI/PDSI in the teaching and learning of mathematics and science. This was what prompted the research on exposition of experiment and improvisation approach through Activity, Students' Experiment and Improvisation/Plan, Do, See and improve ASEI PDSI on level of awareness, gender disparity, in the area at Sokoto state university for science education students' teacher. Therefore, the problem of the study put in question form is would experiment and improvisation-based model as ASEI/PDSI be an effective way of improving students' achievement and interest in teaching and learning of mathematics and science subject

Objectives of the research

The findings of this research will be of great significant to many stakeholders such as researchers, teachers, policymakers in education, students, school administrators and society as a whole. Moreover, the study will be of great significance to the policymakers because it will provide a yardstick that will provide an avenue for them to identify their contribution toward proving effective strategy for teaching and learning of mathematics and science subject.

The students/Pupils are one of the main targets of the study. Hence, the study is significant because it will assist them to appreciate the power of the activity based

teaching and learning approach which will definitely improves their creativity and innovative skills which if they were properly exposed to the approach will yield good performance in the area.

The main objects of this study is to find out the is to expose Students' teacher on Activity, Students, Experiment and Improvisation (ASEI)/Plan, Do, See and Improve (PDSI) approach Specifically, therefore in this paper the study is to:

I. Investigate the level of awareness of ASEI-PDSI Approach among Mathematics and Science education student in Sokoto State University.

II. Examine Influence of gender on the level of awareness of ASEI-PDSI Approach among Mathematics and Science education student in Sokoto State University.

Research questions

The study would be guided by the following research questions:

I. What is the level of awareness of ASEI-PDSI Approach among Science education and mathematics education student in Sokoto State University?

II. What is the Influence of gender on the level of awareness of ASEI-PDSI Approach among Mathematics and Science education student in Sokoto State University.

Methodology

Research Design

The research design is descriptive survey design. This type of research involves collection of data through self-developed instrument (questionnaire) .The questionnaire is easy to collect data from the respondents. In addition, it identifies the characteristics of the respondents because as it is, without changing or modifying the situation under investigation as literature expounds (Sambo, 2000).

Population of the Study

The population for this study consists of all the science education students of Sokoto state university. There are total number of 456 students in five Programmes in the department of science education, faculty of education, Sokoto state university.

Table 2: Department of Science Education's Students per Programme

Programme /Level	Education Biology	Education Chemistry	Education Computer	Education mathematics	Education Physic	Total
UG I	37	30	26	5	7	**105**
UG II	44	22	26	9	10	**111**
UG III	52	27	26	9	7	**121**
UG IV	52	31	20	9	7	**119**
total	**185**	**110**	**98**	**32**	**31**	**456**

Sample and Sampling Techniques

Stratify systematic random sample was employed. The sample for this study were taken out of the total population of the science education department students in the faculty of

education Sokoto State University. The total number of five units namely; Education biology, Education Chemistry, Education Computer, Education Physics and Education Mathematics were considered with the total population of 456 students out of which sample size of 217 respondents at 5% margin error and 95% significant level using research advisor table was selected.

Research Instrument

The instruments to be used for the purpose of this study will be training module named; ASEI-PDSI approach for mathematics and science teacher Training Module (ASEI-PDSI TMMST), Semi-Structured interview will be generated on the perception of student teachers' achievement and interest. Another instrument to be use is Student teacher level of awareness and gender influence on ASEI-PDSI approach Questionnaire (STLAGIAQ) with Five Likert options scale.

Validity of the Instrument

Level of awareness of ASEI-PDSI approach among mathematics and science education student Questionnaire (LAOAMASEQ) were be given to experts in the Department of Science Education, faculty of education for the face validity, observations, correction and observation were taken into considerations.

Reliability of the Instrument

Level of awareness of ASEI-PDSI approach among mathematics and science education student Questionnaire (LAOAMASEQ) was tested using Cronbach alpha method to establish the reliability score of the instrument.

Method of Data Collection

Data will be collected from the respondents by using (LAOAMASEQ) questionnaire. The questionnaire was administered by the researcher and research assistants to the targeted respondents over 217 participants.

Method of Data Analysis

The data was collected from the respondents and analysed with the use of statistical package for social science (SPSS) version 16.0. Descriptive statistics with the use of frequencies, percentage and t test was used to analysed the Data.

Result

Table 3: Gender Distribution

Gender	Number	Percentage (%)
Male	147	68.70
Female	70	32.30
Total	**217**	**100**

Table 3 reveals that wile over 68% of the respondents are male, not more than 32% are female. This shows that there are more respondents than their female counterpart.

Table 4: ASEI PDSI assessment scale

No	Test Items	Correct Response (%)		Incorrect Response (%)		Total
		male	Female	male	Female	
1	Choose the sentence that describe the full meaning of ASEI	13(5.9)	7(3.2)	134(61.8)	63(29.1)	**217**
2	Choose the sentence that correctly describe the meaning of PDSI	15(6.9)	8(3.7)	132(60.8)	62(28.6)	**217**
3	The Fundamental Features of ASEI PDSI Lesson Plan are as Follows	12(5.5)	6(2.8)	135(62.2)	64(29.5)	**217**
4	The Following are the Feature of ASEI PDSI Approach that has to be taking into consideration:	16(7.4)	9(4.15)	131(60.37)	61(28.1)	**217**
5	Select the most appropriately Sentence that describes the acronyms SMASE	14(6.5)	9(4.15)	133(61.3)	61(28.1)	**217**
6	Choose a sentence that most appropriately describes the tip for better actualization of ASEI lessons in classroom	17(7.8)	8(3.7)	130(59.9)	62(28.6)	**217**
7	Choose a sentence that most appropriately describes the way to give instructions to pupils in ASEI PDSI Approach.	12(5.51)	8(3.7)	135(62.21)	62(28.6)	**217**
8	Choose a sentence that most appropriately describes teachers' questioning techniques in ASEI lessons	12(5.5)	6(2.8)	135(62.2)	64(29.5)	**217**
9	SMASE promotes peer teaching as a part of lesson preparation. The peer teaching is followed by a review meeting. Which of the options below is INAPPROPRIATE as an agenda of review meetings after peer teaching?	13(6.0)	5(2.3)	134(61.8)	65(30.0)	**217**
10	Which statement is INAPPROPRIATE as a check list for assessing ASEI lessons?	10(4.6)	10(4.6)	137(63.1)	60(27.6)	**217**
	Total	**134**	**76**	**1336**	**624**	**2170**

With regards to the sentence that describe the full meaning of ASEI, 5.9% of the Male respondents answered it correct and 3.2% of the female respondents answered it correct so also 61.8% of the Male respondents answered it not correct 29.1% of the female respondents answered it not correct. Choose the sentence that correctly describe the meaning of PDSI

With regards to the sentence that correctly describe the meaning of PDSI 6.9% of the Male respondents answered it correct 3.7% of the female respondents answered it correct however 60.8% of the Male respondents answered it not correct and 28.6% of the female respondents answered it not correct

In another facet the sentence that describe the Fundamental Features of ASEI PDSI Lesson Plan 5.5% of the Male respondents answered it correct 2.8% of the female respondents answered it correct however 62.2% of the Male respondents answered it not correct and 29.5% of the female respondents answered it not correct

In another development Feature of ASEI PDSI Approach that has to be taking into consideration 28.1% of the Male respondents answered it correct and 7.4% of the female respondents answered it correct However 4.15 % of the Male respondents answered it not correct 60.37% of the female respondents answered it not correct.

With regard to the Selection of the most appropriately Sentence that described the acronyms SMASE 6.5% of the Male respondents answered it correct and 4.15% of the female respondents answered it correct However 61.3% of the Male respondents answered it not correct and 28.1% of the female respondents answered it not correct.

In a sentence that most appropriately describes the tip for better actualization of ASEI lessons in classroom (7.8) of the Male respondents answered it correct and (3.7) of the female respondents answered it correct However (59.9) of the Male respondents answered it not correct and (28.6) of the female respondents answered it not correct.

In the sentence that most appropriately describes the way to give instructions to pupils in ASEI PDSI Approach. 5.51% of the Male respondents answered it correct and 3.7% of the female respondents answered it correct However 62.21% of the Male respondents answered it not correct and 28.6% of the female respondents answered it not correct.

In a sentence that says most appropriately describes teachers' questioning techniques in ASEI lessons 5.5% of the Male respondents answered it correct and 2.8 % of the female respondents answered it correct However 62.2% of the Male respondents answered it not correct and 29.5% of the female respondents answered it not correct.

In sentence that says SMASE promotes peer teaching as a part of lesson preparation. The peer teaching is followed by a review meeting. Which of the options below is INAPPROPRIATE as an agenda of review meetings after peer teaching? 6.0% of the Male respondents answered it correct and 2.3% of the female respondents answered it correct However 61.8% of the Male respondents answered it not correct and 30.0% of the female respondents answered it not correct.

In a question "Which statement is INAPPROPRIATE as a check list for assessing ASEI lessons"? 4.6% of the Male respondents answered it correct and 4.6% of the female respondents answered it correct However 63.1% of the Male respondents answered it not correct and 27.6% of the female respondents answered it not correct.

Level of awareness in terms of Gender distribution

Percentage of Male correct answers out of their total responses

= tCrpM / (tCrpM + tIncrpM)*
=100 134/ (134+1336) * 100
= 9.1%

Percentage Female correct answers out of their total responses

= tCrpF / (tCrpM + tIncrpF)* 100
= 76/ (76+624) * 100
= 10.8%

Percentage of Male Incorrect answers out of their total responses

= tInCrpM /(tCrpM + tIncrpM)*100

= 1336/ (134+1336) * 100

= 90.9%

Percentage Female Incorrect answers out of their total responses

= InCrpF /(tCrpM + tIncrpM)*100
= 624/(76+624) * 100
= 89.2%

There was no significant difference between male incorrect response 90.9% and their counterpart female of about 89.2% at $P < 0.05$

Where tCrpM is the total correct responses of male

tIncrpM is the total incorrect responses of male

tCrpF is the total correct responses of Female

tIncrF is the total incorrect responses of Female

Discussion

With regards to full meaning of ASEI, PDSI, Fundamental Feature ASEI PDSI, its lesson plan and some respondents are not aware about the concept this in conformity with the findings of Katiambo, (2019) who stated that there is little knowledge about the concept of ASEI-PDSI approach among mathematics and science. When it comes to the actualization of ASEI PDSI approach in classroom situation which comprised the last five Items of the questionnaire most of the respondents showed drastic level of unawareness of the approach which also Support the above finding.

With regards to Level of awareness in terms of gender distribution there was no significant difference between male level of unawareness of about 90.9% and their counterpart female of about 89.2% out of their total responses at $P < 0.05$ which portrayed the level of unawareness concerning the concept. According to Jordan, (2017)

when the test score data were disaggregated on the base of race and gender, there was no proof of an achievement gap, this was in total agreement with the above finding

Conclusion

ASEI PDSI approach is a new approach in Nigeria in most cases teachers at Basic and secondary level are not familiar with this new approach. Few of those that are aware are not implementing the principles. The beauty associated with the actualization of this approach in the teaching and learning of Mathematics and science cannot be over emphasized. It encourages creativity, improve skills of improvisation of instructional materials when the conventional ones are not available and facilitate active participation on the part of the teachers and leaner.

Recommendations

I. The government should encourage Basic and Secondary level school teachers to be attending SMASE training

II. Proper monitoring and Supervision should be given priority at level of school system for fully implementation of the new approach

III. Modules should be provided in SMASE training Centre

IV. Government should integrate ASEI PDSI approach into teacher Education programmes

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