

ASEI-PDSI Lesson Approach and Quality Assurance in Classroom Delivery in Ilorin West Local Government Area Basic Schools, Kwara State.

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Abstract

Strengthening Mathematics, Arts and Science Education SMASE in-service Training initiatives aim at building a technologically inclined citizens and moving teaching and learning from the teacher-centered to student-centered. This study therefore assessed the attitude of basic school teachers to SMASE'S ASEI-PDSI lesson plan approach in the teaching and learning, the level of quality assurance in classroom delivery in basic schools and learners' perception in the use of ASEI-PDSI lesson approach. A descriptive survey of expo facto research design was adopted. The population comprises all upper basic schools in Ilorin West Local Government, Kwara State. Purposively, principal officers, teachers and their students are the target population for the study. Simple random sampling procedure was used to select participants (100 teachers, 30 principal officers and 200 learners/students). "Teachers' Attitude ASEI-PDSI Lesson Plan Questionnaire" (TAALPQ), "Principal Officers' Quality Assurance in Classroom Delivery Checklist" (POQACD) and "Learners' Perception of ASEI-PDSI Lesson Approach Checklist" (LPALAC) were used for data collection. Content and face validity of the instruments was done. The instruments were found reliable at 0.799, 0.815 and 0.628 coefficients respectively with the use of Cronbach Alpha. Descriptive statistics and inferential statistic of independent t-test were used. The hypothesis formulated was tested at 0.05 level of significance. It was found that teachers' attitude towards ASEI-PDSI lesson plan approach was very good at 64 %, the level of quality assurance in the classroom delivery was moderate at 66.7 % and learners' perception of the use of ASEI-PDSI lesson approach was outstanding at 93.0 %. Male teachers have more favorable attitude towards ASEI-PDSI lesson plan approach than the female teachers $\bar{x} = (30.46; 28.36)$, $t (2.026) = .042$ $p > .05$. Hence, it was recommended that local and multi-national organisation support can be annexed to enhance the full implementation of this project via sponsorship and funding.

Keywords: SMASE, ASEI-PDSI, In-service, Training, Quality Assurance, Classroom

Introduction

The quality of life in any society depends significantly on its standard of education (Onwuka, 2009) and the standard of education revolves round the quality of basic education the teaching of the Mathematics, science and arts education at the foundational level. Therefore there is an index of quality of the life and development of a nation. It then behooves on all stakeholders in the educational industry to ensure that all subjects is well taught and learnt in the school system especially at the Basic level. Science and technology are imperative for a sustainable global development. Through the appropriate teaching, learning and applications of science right from our basic education level there will be more productive education system in Nigeria. In attempt to find solutions to the dwindling quality of education in Nigeria, the Nigeria Teachers Institute (NTI) in conjunction with the Federal Ministry of Education, universal Basic Education Board collaborated with Japan international corporations Agency (JICA) to bring in “The Strengthening of Mathematics and Science Education” In-service Training Nigeria, initiatives called SMASE-INSET Nigeria so as to improve the teaching and learning of mathematics and science subjects in our basic schools which is also intended to be spread through the teaching of other subjects in our basic schools up to our secondary school level so as to build a technologically inclined citizens by moving teaching and learning in class room from the teacher centered approach to activity based, student centered, experimentation and improvisation - plan, do, see and improve (ASEI-PDSI) approach.

In Nigeria, improving quality of Mathematics and Science education is essential for national development, more specifically, joining one of the top industrial countries in the world in accordance with the Vision 2020. Teacher development, especially at the primary and secondary schools, is the key factor. To this end, JICA is now implementing a technical cooperation project, titled "Strengthening Mathematics and Science Education Project (SMASE project) jointly with the Federal Ministry of Education an in-service training for teachers as they play a vital role in ensuring success and quality of education. Unfortunately, in Nigeria, concepts' teaching in schools has been more of teacher-centered approach. This probably may account for the learners' poor achievement (Ukeje, 1997). In a bid to find solution to the poor achievement of learners at the Basic level in Mathematics and science, the Federal Ministry of Education (FME) felt there is need to regularly update teachers' skills and knowledge through In-Service Education Training (SMASE,2012). This led to the birth of SMASE Nigeria project; which uses ASEI-PDSI teaching approach. In-service training of teachers is conducted with the aim of addressing the change from teacher centered approach in teaching (Njoki, 2014).

The SMASE is an acronym from the phrase Strengthening Mathematics and Science Education. In Nigeria, the headquarters is National Teachers Institute (NTI),

Kaduna. The Federal Government of Nigeria (FGN) in 2006 reached an agreement with Japan International Cooperation Agency (JICA) to establish SMASE in Nigeria (SMASE, 2012). The choice of JICA was made because of their success stories recorded in some Africa countries in organizing and executing sustainable quality programmes for Mathematics and science teachers. These countries include Malawi, Ghana, Kenya, South Africa, among others. ASEI-PDSI is an acronym in which A -stands for Activity based S- stands for Student-centered E -stands for Experiments I - stands for Improvisation P- stands for Plan D- stands for Do S -stands for See and I - stands for Improve

Okello (2016), stated that the principles of ASEI-PDSI approach calls for a shift in paradigm from traditional practice which is teacher-centered to that of pupils-centered and activity based as well as practically knowledge-bound. The teacher uses an ASEI lesson plan in order to enhance the quality of his/her teaching. The features of an ASEI lesson are stipulated as: Activity – based teaching, Student – focused learning, Experiment/Research based approach.

The objectives of SMASE Nigeria Project is mainly the ability of basic school teachers to conduct student-centered lessons in mathematics and science in pilot states (Kaduna, Niger and Plateau) is enhanced and circulated down to other states also having state trainers from 33 states and the Federal Capital Territory. Counterpart Agency includes Federal Ministry of Education (FME), Universal Basic Education Board (UBEC), National Teachers' Institute (NTI), State Universal Basic Education Board (SUBEB). The Main Characteristic of SMASE Project includes:

- (1) Focusing on In-Service Education Training (INSET) SMASE Project addresses improving quality of teachers in terms of attitude, pedagogy, mastery of content, resource mobilization and utilization of locally available teaching materials.
- (2) ASEI & PDSI Approach: SMASE Project aims to shift teaching paradigm from "banking style/chalk & talk" to "ASEI & PDSI approach." ASEI & PDSI approach is the effective approach for ensuring the quality of mathematics and science lessons and their steady improvement. ASEI, which is an acronym for Activities, Students, Experiments and Improvisation is a key word in the SMASE project for lesson innovation. ASEI lesson is made possible through PDSI practice (Plan, Do, See, Improve).

The Federal Ministry of Education and JICA conducted a baseline survey in 2005 to ascertain the strategies in use, the needs and challenges facing teaching learning of mathematics and science at primary education level. Major findings of the survey presented to stakeholders showed a mirage of difficulties such as (i) poor Teacher-Pupil strategy, (ii) perceived difficult concepts, (iii) monotonous use of lecture method of teaching and (iv) inadequate and poor utilization of available teaching materials to

mention but few. JICA's intervention is to put in place a system of INSET for teachers of mathematics and science education in Nigeria that can be adapted and replicated in other states of the Federation apart from the pilot states.

UNESCO (2016), The Association for Development of Education in Africa (ADEA) (2014), and Orado (2017), have all emphasized the need for teachers who are adequately prepared to implement science and mathematics curricula. It is on this premise that teachers influence learning outcomes and therefore one way Africa countries can move forward in building their human capital. USAID, (2010), observed that although many teachers were intrinsically motivated to work. They, like every other profession deserve fair compensation, good conditions of service and opportunities for progress. The share size of the teaching force is a problem because it is the largest personnel group on most government's pay roll. Basic school teachers are issued certificate after attending each cycle of the SMASE ASEI-PDSI in-service training which could be used as a recognized tool for promotion, however teachers are not well remunerated for attending in-service trainings which was a bone of contention during the training and the implementation of the training.

Also a study conducted by Wanbui (2006), found that school head teachers had significant effect on teacher's teaching practices and also that the nationwide SMASE project impact assessment survey conducted in 2004 established that teachers who has been exposed to the ASEI-PDSI approach planned better lessons and more consistently, attended to student's needs better, were more opened to team work, were more confident, tried out new methods of teaching and faced challenges of large classes and lack of teaching /learning resources better. Equally it was established that students being handled by such teachers were actively involved in the learning Process, showed great interest and responsiveness, did their assignment readily and promptly, carried discussions beyond class time, had an improved relationship with teachers, developed team work and their attitudes towards learning changed for better. It was also noted with administration of achievement test that there was a positive and significant effect on the students' achievement as a result of SMASE ASEI-PDSI lesson plan approach of teaching and learning in schools. Ochonga (2013), noted that studies have shown that the ASEI-PDSI approach when not supervised by both quality assurance and standard officers and the head teachers has let in the poor performance in the school external examinations. Many head teachers spend more time with finance management than with curriculum and instructions, a factor attributed to lack of effective training in educational administration, thus lacking expertise to carry out effective supervision and evaluation of the curriculum practices in schools.

The SMASE INSET ASEI-PDSI WAS brought down to Kwara state by Kwara SUBEB in conjunction with UBE, NTI, FME and JICA after less than 20 teachers were selected from the state and trained at the National level at Kaduna NTI's headquarters. In the year 2014 April was the Cycle 1 of the training involving 200 mathematics and science teachers selected from the 16 LGAs in the state. The Cycle 2 training was held in the year 2016 August with 200 teachers also and the Cycle 3 training was held in the year 2018 February, involving 200 teachers too from all disciplines including mathematics, arts and science trying to ensure same teachers were trained in the three cycles. After each cycle teachers went back to their local governments where their LGEAs sponsor the local training and the school principals and head teachers see to the school based training so as to carry all teachers across the state along and well informed about the SMASE ASEI-PDSI training. The implementation of the ASEI-PDSI was advocated for at the Ilorin West Local Government and some other LGAs in the state and its monitoring was done to ensure the step down in all schools in Ilorin west LGA earlier this year. It's based on this fact that this researchers wish to assess the; attitude of teachers, the level of quality assurance in it class room delivery and the perception of learners towards this new approach.

Purpose of the Study

. The purpose of this study was to

- Assess the attitude of basic school teachers to SMASE'S ASEI-PDSI lesson plan approach in the teaching and learning of mathematics, science and arts education in basic schools.
- Assess the level of quality assurance in classroom delivery in basic schools.
- Investigate learners' perception in the use of ASEI-PDSI lesson approach.

Research Questions

The following research questions were used to guide the study:

- i. What is the attitude of teachers to the ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area?
- ii. What is the level of quality assurance in classroom delivery with the ASEI-PDSI lesson approach in basic schools in Ilorin West Local Government Area?
- iii. What is the students/learners' perception in the use of ASEI-PDSI lesson approach?

Research Hypothesis

One research hypothesis was formulated and tested in this study

HO. There is no significant difference between male and female teachers' attitude to the ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area.

Methodology

A descriptive survey of expo facto research design was adopted for this study. The population of this study comprises of all upper basic schools in Ilorin West Local Government, Kwara State. Multi-stage sampling technique was adopted for this study. Purposively, principal officers, teachers (who have been exposed and are already implementing the SMASE ASEI-PDSI lesson plan) and their students are the target population for the study. Simple random sampling procedure was used to select participants (100 teachers, 30 principal officers and 200 learners/students) across the upper basic schools in the Ilorin West Local Government. The 30 principal officers who assessed teachers' lesson plan and classroom delivery such as the assistant head teacher/ vice principal academics/HODs.

The instrument that was used to collect data were; "Teachers' Attitude ASEI-PDSI Lesson Plan Questionnaire" (TAALPQ), "Principal Officers' Quality Assurance in Classroom Delivery Checklist" (POQACD) and "Learners' Perception of ASEI-PDSI Lesson Approach Checklist" (LPALAC). Content and face validation was carried out by giving it out to 3 experts in Educational Management and Measurement and Evaluation. The reliability of the instrument was established using the Cronbach Alpha statistic. The instruments were found reliable at 0.799, 0.815 and 0.628 coefficients respectively. The research questions were answered using descriptive statistics of frequency, mean rating and percentage while inferential statistic of independent t-test was used to test the research hypothesis formulated at 0.05 level of significance.

Results and Discussion

Research Question 1: What is the attitude of teachers to the ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area?

Research Question One was answered based on the rating scale as responded to by the teachers who have been introduced to ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area as shown in Table 1. Mean scores of the responses were summed up and the decision was taken considering the rule.

Table 1

Attitude of Teachers to the ASEI-PDSI Lesson Plan Approach in Teaching and Learning

Level	Score Range	Frequency	Percentage
Poor	1-10	-	0.00
Fair	11-20	9	9.0
Good	21-30	27	27.0
Very Good	31-40	64	64.0
Total		100	100.0

Table 1 reveals that the attitude of teachers to the ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area is very good at 64 %. The range was determined by the sum of the items (10) multiplied by 4 (response scale) and equaled to 40. The maximum score will be 40 while the minimum 10. Therefore, the data was recoded to 1-10 = 1, 11-20 = 2, 21-30 = 3 and 31-40 = 4. Hence, the percentage was used to determine the level of their attitude. Thus, it means teachers' attitude to the ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools is excellent in Ilorin West Local Government Area, Kwara State.

Research Question 2: What is the level of quality assurance in classroom delivery with the ASEI-PDSI lesson approach in basic schools in Ilorin West Local Government Area?

Research question two was answered based on the rating scale as assessed by the principal officers of teachers who have been introduced to ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area as shown in Table 2. Mean scores of the responses were summed up and the decision was taken considering the rule.

Table 2

Level of Quality Assurance in Classroom Delivery with the ASEI-PDSI Lesson Approach

Level	Score Range	Frequency	Percentage
Low	14-27	4	13.3
Moderate	28-42	20	66.7
High	43-56	6	20.0
Total		30	100.0

Table 2 shows that the level of quality assurance in classroom delivery with the ASEI-PDSI lesson approach in the basic schools in Ilorin West Local Government Area as assessed by the principal officers is moderate at 66.7 %. The range was determined by the sum of the items (14) multiplied by 4 (response scale) and equaled to 56. The maximum minus minimum (56-14) equaled to 42 divided by 3. Thus, the data was recoded to 14-27 = 1, 28-42 = 2, and 43-56 = 3. Hence, the percentage was used to determine the level. This implies that level of quality assurance in classroom delivery with the ASEI-PDSI lesson approach in the basic schools in Ilorin West Local Government Area is moderate based on the principal officers' assessment.

Research Question 3: What is the students/learners' perception in the use of ASEI-PDSI lesson approach?

Research question three was answered based on the data obtained from students who have been under the teaching and learning of the teachers with the use of ASEI-PDSI lesson approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area as shown in Table 3.

Table 3
Students/Learners’ Perception in the Use of ASEI-PDSI Lesson Approach

Level	Score Range	Frequency	Percentage
Fair	10-20	2	1.0
Good	21-30	12	6.0
Outstanding	31-40	186	93.0
Total		200	100.0

Table 3 indicates the perception of learners on the use of ASEI-PDSI lesson approach. The result shows that students perceived the use of ASEI-PDSI lesson approach to be outstanding at 93.0 %. The range was established by the sum of the items (10) multiplied by 4 (response scale) and equaled to 40. The maximum minus minimum (40-10) equaled to 30 divided by 3. Hence, the data was recoded to 10-20 = 1, 21-30 = 2, and 31-40 = 3. Therefore, the percentage was used to measure the level of perception. This implies that learners are fascinating with the use of ASEI-PDSI lesson approach in classroom delivery.

HO: There is no significant difference between male and female teachers’ attitude to the ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area.

An independent-sample t-test was conducted on the responses from students of the sampled schools as shown in Table 4.

Table 4
Difference between Male and Female Teachers’ Attitude to the ASEI-PDSI Lesson Plan Approach

Respondents	N	Mean	SD	SEM	T	df	P	Decision
Male	39	30.46	4.27	.685	2.026	98	.042	Not-Accepted
Female	61	28.36	5.36	.686				

Significant @ $\rho < .05$

Table 4 indicates that there was significant difference exist between male and female teachers on the use of ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area. $\tilde{x} = (30.46; 28.36)$, $t (2.026) = .042$ $\rho > .05$. Since the p-value is less than .05 thresholds, the

hypothesis was therefore not accepted. It is evident that male and female are different on the use of ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area. The difference is in the favor of male teachers. This implies that male teachers have a better attitude than their female counterparts.

Discussion

Result from Table 1 reveals that the attitude of teachers towards the use of ASEI-PDSI lesson plan approach in teaching and learning of mathematics, science and arts in basic schools in Ilorin West Local Government Area is very good at 64 %. This means teachers who have been exposed to this approach are finding more interesting and committed to the use of it in their classes. Since the focus of the approach is to move from traditional approach of teachers' centred approach to activity and student-centred approach, it is interesting to deduce from the attitude of the teachers towards the ASEI-PDSI that approach will not only achieve its goals but improve teachers' performance and increase students' academic performance. The finding allude to the submission of Adeyanju (2011), Ijaiya (2012) and Awodiji (2018) who reported that the major weaknesses of the educational system of education in Nigeria is that once teachers complete their initial training, they hardly have the opportunity to continue to grow on the job professionally which often leads to their inefficiency and that those who have opportunities of attending one training or the other, nothing seems to change in their classroom delivery.

Furthermore, the level of quality assurance in classroom delivery with use of ASEI-PDSI lesson approach in the basic schools in Ilorin West Local Government Area as assessed by the principal officers is moderate at 66.7 %. This indicates that ASEI-PDSI lesson approach has moderately enhanced quality in the classroom delivery of teachers. This is perhaps the approach is still on early implementation stage where both the teachers and principal officers are yet to fully key into it. Also, could be attributed to level of involvement of principals in the SMASE INSET where the ASEI-PDSI lesson was taught. Wanbui (2006) found that school head teachers had significant influence on teachers' teaching delivery and the implementation of ASEI-PDSI approach.

In addition, the perception of learners on the use of ASEI-PDSI lesson approach was found to be outstanding. This means that learners welcome the approach and see the approach very interesting in the teaching and learning process. This serves as a pointer that the innovation is found more interesting and of more advantage to them over what has been obtainable previously.

This buttresses Wanbui (2006) findings that the nationwide SMASE project impact assessment survey conducted in 2004 established that teachers who has been exposed to the ASEI-PDSI approach planned better lessons and more consistently, attended to student's needs better.

Lastly, the result also shows that male teachers have a better attitude towards ASEI-PDSI lesson plan approach than their female counterparts. This implies gender has a role to play in the actualization of ASEI-PDSI lesson plan approach among teachers. Hence, female teachers attitude towards the approach could be as a result of technicality and the creativity skills needed with the improvisation of learning materials and other responsibilities attached to the female gender which is less with the male gender which might have make the ASEI-PDSI more burden for the female teachers.

Conclusion

Based on the findings in this study, the attitude of teachers to the implementation of the ASEI-PDSI lesson plan approach in teaching mathematics, art and science was excellent. This can be partly due to the moderate level of quality assurance by the principal officers in supervising classroom delivery, added to the outstanding level of learners acceptance of ASEI-PDSI lesson approach which is an improved approach towards teaching and learning in classroom which makes learning more permanent and makes learning fun rather than the former teacher centered and teaching in abstract which has been the former practices. The previous teaching approach by teachers in Kwara State basic schools was due to inadequate/ unavailability of teaching/learning materials, lack of training and ideas on improvisation of learning materials, poor subject mastery, poor logical presentation of concepts and less experimentation that is low/no activities aiding teaching and learning in the basic schools all of which are the focus and strategies advocated for teaching and learning in the ASE-PDSI lesson approach. The study also found that the principal officers' supervision of the implementation of ASEI/PDSI classroom practices in ensuring quality classroom delivery was moderate which can be attributed to level of involvement of principals in the SMASE INSET where the ASEI-PDSI lesson was taught.

Recommendations

It was therefore recommended based on the findings:

- That the government should provide adequate facilities to teachers to facilitate adequate preparation for ASEI lessons and structural facilities that will aid learner centered approaches that the innovation recommends.
- Also that in-service training for teachers such as the SMASE INSET should be organized regularly by the state government, the SUBEB and the local government education authority so as to be able to train all teachers on the new approach of ASEI-PDSI lesson on a regular basis either at the school based training level, local government level or the state level.

- In addition teachers should be well encouraged through incentive for attending training by adding training allowances to their grade level in their monthly salary so as to motivate teachers to keep up having an excellent attitude towards all new innovations to better the lot of education at the basic education level.
- There is need for the head teachers/ principal officers to attend the ASEI/PDSI training and strengthen the supervision of the ASEI/PDSI classroom practices implementation further for high level of quality assurance in basic schools' classroom delivery.
- Also, more instructional teaching/learning models and materials should be supplied to school so as to ease the burden of frequent improvisation of learning material which may sometimes cost both teachers and learners' time and money so as not to demotivate them towards the new ASEI-PDSI lesson approach.
- The Ministry of Education should develop a follow-up strategy to ensure that innovations are being implemented in the classrooms after an in-service training. This can be done by the Bureau of Quality Assurance (BQA) officers to ensure quality is maintained and to assist those having difficulties implementing the new practices and so as to ensure all teachers in all local government of the state can start implementing the innovation fully
- Local and multi-national organization support can be annexed to enhance the full implementation of this project via sponsorship and funding.

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