EVALUATION OF THE STRENGTHENING MATHS AND SCIENCE EDUCATION PROGRAM IN OYO STATE PRIMARY SCHOLS, NIGERIA

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CERTIFICATION

I certify that this work was carried out by SANGODOYIN, Taiwo Tajudeen in the Institute of Education, University of Ibadan, under my supervision.

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DEDICATION

This work is dedicated to the Almighty Allah, the owner and helper of my life, who beatifies my life through his messenger Prophet Muhammad. May the Peace of Allah be upon him.

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ABSTRACT

The Federal Government of Nigeria introduced the Strengthening Maths and Science Education (SAMSE) Program for re-trianing primary schol Instructors in Nigeria with a view to updating Instructors' knowledge and skills at all the three levels of government (national, state and local). Studies have evaluated the effectiveness of the SAMSE program in empowering secondary schol Maths and science Instructors with limited attention with regard to the extent to which the program has achieved its objectives in primary Schols in Oyo State as a result of its being a maiden program in the State. Hence, this study was designed to evaluate the effectiveness of the SAMSE program in Oyo State primary schols, considering the teacher variables (qualification, experience, age, pedagogy, knowledge of program objectives and perception of SAMSE program) and learners' disposition and achievement in Maths. The moderating effects of gender and schol location were investigated.

The Kirkpatrick 4-level evaluation model was adopted while causal-comparative design of *expo-facto* research type was used. The proportionate to size sampling was employed to select 10 local government areas from the existing three senatorial districts in Oyo State. Schols were stratified into urban and rural, and SAMSE and non-SAMSE. Twenty schols, 20 primary V Maths Instructors and 25 learners were randomly selected from each of SAMSE and non-SAMSE schols, making a total of 40 schols, 40 Instructors and 1000 learners (40 x 25learners). The instruments used were: Learners' Maths Achievement Test (r =0.77), Instructors' Knowledge and Perception of SAMSE Program Questionnaire (r=0.82), SAMSE Program Instructors' Questionnaire (r=0.75), Instructors Disposition towards Maths Questionnaire (r= 0.74), Learners' Disposition towards Maths Questionnaire (r=0.88) and SAMSE Observation Scale (r=0.82). Data were analysed using descriptive statistics, t-test and analysis of variance at $\alpha = 0.05$.

Majority of the SAMSE Instructors (95%) had the knowledge of the program's objectives and SAMSE program improved their skills acquisition. The SAMSE Instructors complied with the objectives of the SAMSE program (70%). There was significant difference between Maths achievement and disposition of learners taught by SAMSE ($t_{(995)}$) = 2.90 and non-SAMSE Instructors ($t_{(995)}$ = 2.05). The taeching effectiveness of SAMSE Instructors was also significantly better than the non-SAMSE Instructors ($t_{(38)}$=7.78). There was a significant difference between SAMSE and non-SAMSE learners' performance in and disposition towards Maths in urban and rural areas ($F_{(1,995)}$ = 32.36). However, based on gender, no significant differences existed between SAMSE and non-SAMSE Instructors and learners' performance, and disposition towards Maths. Also, no significant attitudinal difference existed between the SAMSE and non-SAMSE Instructors in terms of qualification, taeching experience and age.

The Strengthening Maths and Science Education Program was effective in improving Instructors' knowledge of the subject and their learners' achievement in, and disposition towards Maths in Oyo state primary schol. The program should be continued and regularly organised for Instructors' improvement. Also, adequate in-service trianing opportunities for Maths Instructors should be made available.

Keywords: Strengthening Maths and Science Education in Oyo State, Learners Maths achievement, Learners disposition to Maths, Instructors disposition to Maths taeching

Word count: 464

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Abbreviations/Acronyms

PMAT: Learners' Maths Achievement Test

SPTQ: SAMSE Program Instructors Questionnaire

PATMLS: Learners Disposition Towards Maths Learning Scale

TATMTQ: Instructors Disposition Towards Maths Taeching Questionnaire

STKPSP: SAMSE Instructors Knowledge and Perception of SAMSE program Questionnaire

SAMSEPAOS: Strengthening M

INSET: In-service trianing

SBT: Schol based Trianing

ESSPIN: Education Sector Support Progamme in Nigeria

MLA: Monitoring of Learning Achievement

CS: Composite Survey

CHAPTER ONE

INTRODUCTION

1.1 Background to the problem

In a world that is technologically and scientifically oriented, success is driven not only by what you know, but by what you can do with what you know. Therefore, it has become imperative for students to acquire innovative and creative knowledge and skills to solve any problem. They also need skills to extract and asses information. Innovation and creativity are the relevant skills that students need by studying Science, Technology, Engineering and Maths (STEM)

Taeching for understanding, which is the same as taeching for meaningful learning is what is expected from science oriented curriculum. Unless this is achieved, no sustainable development can take place in the nation. Scientific knowledge, in form of ideas or principle, that is not understood cannot be applied, and without application, there cannot be innovation, creativity and technology. The study of Maths plays more important roles than many people realize. Maths is also a prominent part of the child's studies in sciences. Although science may appear to be quite a different subject, Maths can ultimately help the child to understand scientific concepts easily. Maths is a tool that reinforces scientific theories, and can be a driving force that powers scientific discovery. By helping the child to practice Maths, the child is also helped to improve his or her science skills. Maths can reveal and relate what scientists discover by helping them find relationships between an experiment's hypothesis and the data that is collected. By using statistics, scientists can use data as evidence to either support or dispute their original theories. Without the application of Maths in this regard, proving or disproving scientific theories would be impossible.

Apart from language, Maths is the next subject in the schol curriculum which is considered world over, as inevitable. This is because mathematical skills are used every moment in daily activities. Maths is seen as the language used to describe the problem arising in most branches of Science and Technology. It is a subject that is related to other schol subjects in the

field of number and numeration, variation, graphs, fraction, logarithms and indices, algebraic process, solution of equation as well as areas and volumes. Apart from the relevance of Maths in science and technology, Maths skills are also utilized in such areas as painting, music, management information systems, traffic control, accounting and in a wide range of application (Saddiq, 2001).

The history of Maths reveals that Maths concepts such as counting, measuring, fractions, geometric, relations, equations, probability had their origin in problems faced by the scientists and other mathematicians of the past. Babalola in Fantola and Abimbola (2012) maintained that Maths is a basic tool in the development of any science based knowledge such as technology, industry and even for sound analytical reasoning as regards everyday life in today's society. Having a solid background in Maths helps students develop sophisticated perspectives and offer more career options. This probably explains why the learning of Maths has been emphasised by educators and administrators (Willkins and Ma, 2002).For example, the 9 years basic education Maths curriculum for primary 4-6 (revised 2014) is focused on giving learners the opportunity to:

- Acquire mathematical literacy necessary to function in an information age.
- Cultivate the understanding and application of Maths skills and concepts necessary to thrive in the ever changing technological world
- Develop the essential of problem solving, communication, reasoning and communication within the study of Maths
- Take advantage of the numerous career opportunities provided by Maths
- Become prepared for further studies in Maths and other related field (FGN Education Policy revised edition 2014).

To achieve the goals of Maths taeching and learning at the primary schol level, the methods and strategies of instruction must be in line with the aspiration of the learners, must suit their interest and comply with modern development which focuses on active learning that allows the learner to play active role in the process of learning (Abidoye, 2014). Despite the importance attached to Maths, and STEM in particular as well as the various taeching techniques adopted in handling the STEM subjects, it is still revealed from various researches conducted in Nigerian Universities that there is gross under-achievement of students in Science, Technology,

Engineering and Maths (STEM) subjects. This is as a result of various factors related to students, Instructors, schols, government, parents and stakeholder (Okpala, 2011).

The importance of Instructors as links of educational program cannot be overlooked and their contribution to learners' achievementneeds more attention. Afe (2003) expressed that the teacher is a person who engages in interactive behaviour with the learners, effecting cognitive, affective or psychomotor changes or a combination of these domains in childen. There are various ways by which the teacher can influence his students' achievement. These include: desire to teach; quality of taeching; methodology; frequency of evaluation; mastery of the subject; stimulating interest in the subject and cordial relationship with the students. If all these are fully exhibited, there is tendency for positive change towards the taeching and learning process. Also, a good teacher is being identified through resourceful taeching.

It is possible for children to learn without a teacher. It is a fact that childen learn many things without their teacher. However, learning often results from taeching. Osokoya (1996) defines taeching as the intended behaviour for which the aim is to induce learning. Also, he explains further that taeching is the set of activities a teacher applies to translate intentions and curriculum materials into a conducive manner to promote learning. In addition, taeching involves implementing strategies that are designed to lead the learner to the attainment of certain goals. Taeching is more than presenting information or ideas to students or learners, it includes probing, analyzing and discovering usually referred to as reflective thinking. In the taeching process, both the teacher and the learner must be active. The learner learns through some activities while the teacher does all he considers necessary to make learning possible. For effective taeching and learning process, there is need for a proper way of disseminating instruction and proper planning must be put in place. It is through planning that the teacher can determine the scope and sequence of units, topics and lesson; identify and use basic resource for enriching students understanding of the subject; and finally, set objectives appropriate to the content, students' growth and the different levels of understanding.

Planning usually results in better Maths taeching. Therefore, a good taeching strategy needs to change the behaviour of the learner positively. For this to occur, there is need for thorough planning with regard to the taeching and learning process. However, rather than witnessing an improvement in Maths scores, it has been discovered that leaners' performance in Science and Maths is generally low. This is because among others, taeching and learning of

science and Maths are theoretical and teacher centred. Evidence of this was shown in the results of the monitoring of Learning Achievement by the Federal Ministry of Education based on samples of primary four and six (for 2004 and 2011 assessments) learners in 37 states and the FCT and the results of the 2012-16 learning outcome in numeracy test in a national report of Education sector support program in Nigeria (ESSPIN) (See Appendices I and II). Data from the Apendix I shows both slight improvements in performance and declines. Achievement in numeracy which seemed higher, improving from 32.20 in 1996 to 43.81 in 2003 declined to 36.28 in the 2011 Monitoring Learning Achievement (MLA). It is instructive to note that the low achievement cuts across all categories of learners irrespective of gender (boys or girls), type (public or private), location (urban or rural) and pre-primary status whether a pupil attended nursery schol or not. Data from apendix I reveals that, no category of learners met the 50 percent mean scores. Apendix II shows the national mean percentage scores and disaggregated data by gender, schol location, type of schol and pre-primary status. Information from the table indicates performance in numeracy also declined from 35.73 in 2003 to 31.19 in 2011.

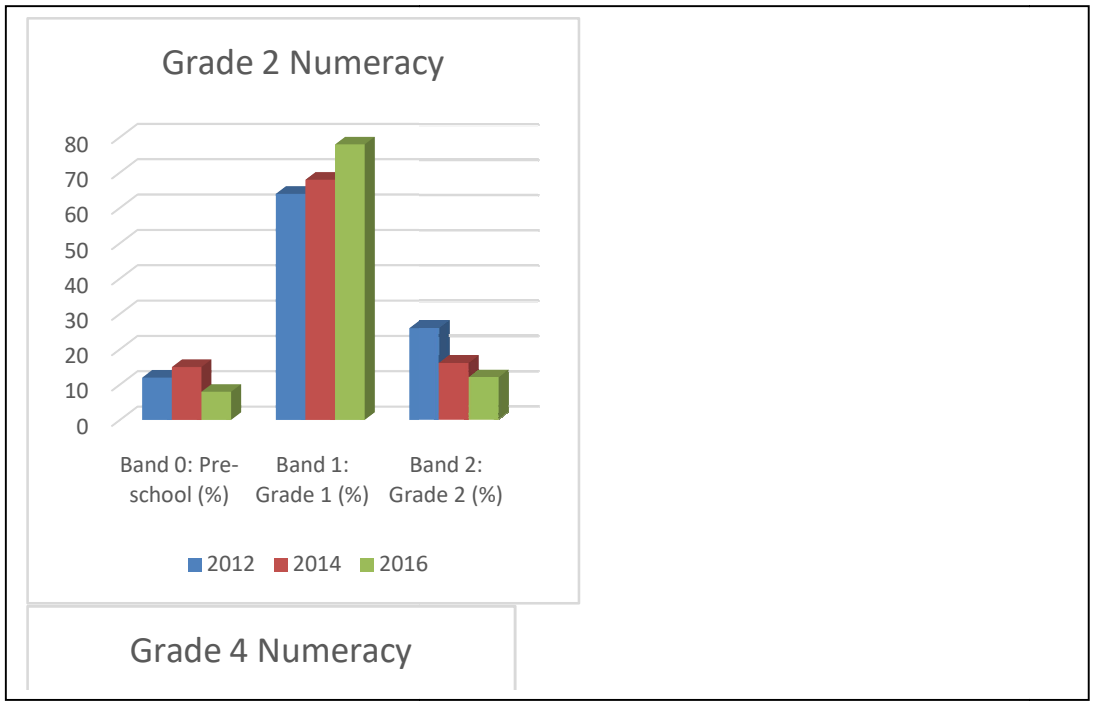

Figure 1.1: **Education Sector Support Program in Nigeria Composite Survey Learning Outcomes 2012-2016 by band**

Source: First and Second Primary Education Improvement Projects

Universal Basic Education Program National Assessment 2012-2016

The learning outcomes in Numeracy of learners in Grade 2 and 4 respectively (see Figure 1.1) in 2016 survey revealed that learning outcomes in numeracy are yet to reach optimal levels. Using the item response theory (IRT) model of analysis, the 2016 survey concluded that the trend in learning outcomes between 2012 and 2016 was mixed. The figure indicates that grade 4 numeracy was better in 2012 than in 2014 and 2016. At grade 2 level, numeracy scores did not change between 2012 and 2016. This established that learners' achievement in Maths, in primary schol is low.

Some scholars such as Akinsola (2000), Oladokun (2010) just to mention a few have applied some approaches for taeching and learning of Maths, yet students' performance in both primary and secondary schols have not been encouraging. In 2005, the Federal Ministry of Education and JICA conducted a study on the status of Maths and sciences in selected primary schols in Nigeria and discovered that schols were facing serious challenges in taeching/learning of Maths and Basic Science. Hence, there was the need to re-establish a strong system of re-trianing of Instructors in the area of Maths and Basic Science at the primary schol level. The Federal Government of Nigeria (FGN), through the Federal Ministry of Education (FME) in collaboration with the Government of Japan through Japan International Cooperation Agency (JICA) therefore organised a program called 'Strengthening Maths and Science Education' (SAMSE) to train the Instructors at all the three levels of government (National, State and Local). The National Instructors' Institute was then mandated to monitor the program.

The National Instructors' Institute was established among other things to upgrade under-qualified and untrained Instructors and organise workshops, seminars and conferences which would assist in the improvement of Instructors. Based on the mandate used in establishing the institute, the SAMSE National INSET centre was moved from the National Commission for Colleges of Education (NCE) to National Instructors' Institute (NTI). The goal and objective of SAMSE program are two folds: to upgrade the capability of primary schol learners in Maths and science and to upgrade the taeching skills of primary schol Instructors and learning skills of learners in Maths and science respectively. The SAMSE program was set to pursue in-service trianing of existing Maths and Science Instructors as a tool for strengthening the subjects. Phase 1 of the project started in 2006 with three pilot states namely Kaduna, Plateau and Niger.

The SAMSE Nigeria program came into being to address some of the deficiencies emphasizing a shift from teacher-centred to pupil-centred, theoretical to activity-based learning

and negative to positive change in dispositions. In teacher-centred approach, all the taeching learning activities in the classroom are usually dominated by the teacher handling the subject, but for pupil-centred approach, all the taeching learning process must be focused on learners and they must be fully involved.

The model of SAMSE In-Service Trianing (INSET) in the cascade trianing was organized on a three tier system (National, State and Local), such that those Instructors that were trained first, are required to train others (See Apendix IV). Opportunity was also opened for those Instructors who failed to attend local INSET and this was called Schol Based Trianing (SBT). This is a trianing held in schols by Headmaster/Mistresses (HMS) and Instructors. It is different from conventional trianings in which someone from higher authority comes and trains Instructors, or only few Instructors are invited to attend. It is carried out with the aim of disseminating the SAMSE approach principle- Activity, Student centred, Experiment and Improvisation/Plan, Do, See and Improve (ASEI-PDSI) through staff meetings. SBT also promotes the actualization of SAMSE approach through open classes and lesson studies as shown in Apendix V.

SAMSE program has an agenda to change negative disposition of the Instructors and learners to positive disposition**.** Teacher's dispositions towards taeching of Maths often have effect in moulding the students' disposition towards the learning of Maths. Students' positive disposition towards the learning of Maths depends upon the Instructors' positive disposition towards the taeching of Maths and this can be achieved through Instructors' behaviour, mastery of the subject matter, good method of taeching in terms of presentation and concern for students. This brought about the researcher to re-examine effect of both Instructors and learners' disposition towards the taeching and learning of Maths in SAMSE program.

Schol location was also considered in the study. The particular environment, in which a learner finds himself/herself at a given time by and large, makes or mars the learner's abilities, capabilities or potentialities (Ezenda, 2003). Some studies carried out by researchers revealed significant effects of schol location on academic performance of students (Owoeye, 2000) while some did not (Yinyinola, 2008). In SAMSE program, Instructors in rural and urban environment were trained and this led to the review of this variable in the study.

Teacher's gender is another variable in this study and has significant effect on instructional strategy in the taeching of science subjects and Maths. According to Kueckn and

Valfort (2012), teacher's gender has an important impact on learners' achievementand it also plays a crucial role in educational attainment. For example, Ifamuyiwa (2008) revealed that male Instructors are more effective in the classroom interaction than the female Instructors while Okonkwo (2000) found that being boy or girl makes no difference in taeching performance. In this study, the researcher is interested in investigating which of them (male or female) would be more effective in the taeching of Maths.

Furthermore, literature revealed that Instructors' qualifications and taeching experience contribute immensely to students' performance and that a teacher who is not well groomed in Maths education will not have basic taeching rudiment in the subject (Elugbaju, 2013). Also, it is assumed that the more years a teacher commits to taeching of a particular subject or a particular group of learners, the more expertise the teacher is expected to demonstrate.

Apart from Instructors' qualification and taeching experience, Instructors' taeching effectiveness as well as Instructors' pedagogical strategy are important factors in determining students' performance. An integral part of most essential skills possessed by good Instructors is that of classroom control. These skills are considered by Oghuvbu and Atakpo (2008) as the most important aspect of a teacher's trianing and that effective classroom management starts with effective lesson preparation. Also, Instructors' pedagogical strategy is much more than a collection of strategies for instruction, it involves many aspects of a teacher's professional expertise. The pedagogy adopted by Instructors ought to shape their actions, judgements, and other taeching strategies by taking into consideration theories of learning, understanding of the students and their needs, and the background and interest of individual students. The measures of taeching effectiveness in other previous studies were determined using learners' achievementtest scores. This study differs from the previous studies because it is designed to measure taeching effectiveness using learners' achievement test scores and Strengthening Maths and Science Education Approach (PDSI-ASEI).

According to Mwangi and Mugambi (2013), the SAMSE INSET program was effective in the Kenyan schols, there were some significant improvement in performance of science and Maths subjects when SAMSE program approach was adopted. Hence, this study provides a comprehensive evaluation of SAMSE program to determine its effectiveness with regard to taeching and learning of Primary schol Maths in Oyo state, Nigeria.

1.2 Objectives of SAMSE program

The evaluation objectives of this study are derived from the two stated objectives of the SAMSE program

1. To upgrade the capability of primary schol learners in Maths and science and
2. To upgrade the taeching skills of primary schol Instructors and learning skills of learners in Maths and science respectively (FME SAMSE Nigeria INSET guideline, 2014).

1.3 Evaluation Objectives

The specific objectives for this study are to:

1. determine if the characteristics of the SAMSE program trainees and non-trainees (age, gender, academic qualification, disposition, and year of experience) have any effect on learners performance in Maths.
2. determine the extent to which trainees have the knowledge of objectives of the strengthening Maths and science education program.
3. examine the performance in Maths of the learners taught by SAMSE and non-SAMSE Instructors in rural environment and those taught in urban environment using SAMSE approach.
4. examine the performance in Maths of the learners taught by female Instructors and male Instructors using the SAMSE approach.
5. investigate the level of performance in Maths of the learners taught by the use of SAMSE approach compared with those taught without the SAMSE approach.

Table 1.3: The grids illustrating matching of SAMSE program Objectives, Evaluation Objectives and Research questions.

SAMSE program objectives	Evaluation objectives	Research questions	Instruments	Data sources	Statistical tools/Data analysis
1	1 5	1a, b 3a, b 6a, b, c	- Instructors' Disposition Towards Maths Taeching Questionnaire (TATMTQ) - Learners Maths Achievement Test (PMAT) - Learners Disposition Towards Maths Learning Scale (PATMLS)	SAMSE program Instructors Non-SAMSE program teacher SAMSE program learners Non-SAMSE program learners	Descriptive statistics, one way Anova ,t-test, Two way Anova
2	2 3 4	**2a, b 4,** **5, and** **6a, b, c**	- SAMSE Instructors' Knowledge and Perception of the SAMSE program Questionnaire (STKPSPQ) - SAMSE program Instructors Questionnaire (SPTQ) - Instructors' Disposition Towards Maths Taeching Questionnaire (TATMTQ) - Learners' Disposition Towards Maths Learning Scale (PATMLS) - Strengthening Maths and Science Education Program Approach Observation Scale (SAMSEPAOS)	SAMSE program Instructors Non-SAMSE program teacher SAMSE program learners Non-SAMSE program learners	Descriptive statistics Two way Anova

1.4 Statement of the problem

Maths is a core subject and very important in the schol education system because of its relevance to human existence. Every effort must be made to ensure that learners understand its basic principles and concepts and also be able to apply it in their daily living right from primary schol. It is observed that some of this learners at the primary schol level are not doing well in both internal and public examinations. Inadequate taeching skills and choice of relevant taeching methods for different classroom taeching-learning situations are some of the problems confronting Maths Instructors. Most of Maths classrooms interactions are teacher centred because Instructors still engage in the use of traditional method of taeching. All these factors have, in no small measure, rendered class activities inactive.

It is in the bid to solve these problems that the Federal Government of Nigeria (FGN) through the Federal Ministry of Education (FME) in collaboration with the government of Japan agency (Japan International Cooperation Agency JIGA), introduced the Strengthening Maths and Science Education Program (SAMSE). The Federal Government of Nigeria directed the National Instructors' Institute (NTI) to conduct re-trianing program for primary schol Instructors with a view to updating Instructors' knowledge and skills at the three levels of government (national, state, and local). However, there seems to be no study that has evaluated the extent to which the SAMSE program had achieved its objectives in Nigeria. Hence, this study evaluated Strengthening Maths and Science Education program with regard to taeching and learning of Primary Maths in Oyo state, Nigeria.

1.5 Research Questions

1. (a) What are the characteristics of the SAMSE program Instructors and non- SAMSE program Instructors in terms of:
   i. Qualifications?
   ii. Years of taeching experience?
   iii. Gender
   iv. Age

   (b) What are the attitudinal differences in taeching Maths between the SAMSE and non-SAMSE program Instructors in terms of:
   i. Qualification
   ii. Years of taeching experience

iii. Gender

iv. Age

2. (a) What is the SAMSE Instructors' knowledge of the SAMSE program's objectives?

   (b) How do the SAMSE program Instructors perceive the effectiveness of SAMSE program in terms of resources and skills acquisition?

3. Is there any significant difference in

   (a) Maths achievement and

   (b) Maths disposition of the learners taught by SAMSE and non-SAMSE program Instructors?

4. Is there any significant difference in SAMSE program Instructors and non-SAMSE program Instructors on taeching effectiveness?

5. What is the level of compliance of SAMSE program Instructors to the prescribed SAMSE program approach?

6. (a) Did teacher gender significantly moderate the effects of SAMSE program and non-SAMSE program on

   (i) Learners' Maths achievement and

   (ii) Learners' disposition to Maths?

   (b) Did schol location significantly moderate the effects of SAMSE program and non-SAMSE program on

   (i) Learners' Maths achievement and

   (ii) Learners' disposition to Maths?

   (c) Did pupil gender significantly moderate the effects of SAMSE program and non SAMSE program on

   (i) Learners' Maths achievement and

   (ii) Learners' disposition to Maths?

1.6 Scope of the study

This study focused on the evaluation of the effect of SAMSE program on the taeching and learning of Maths in primary schols in Oyo state, Nigeria, and it is limited to primary five learners and their Maths Instructors in the state. Though the SAMSE program was based on both Maths and Basic Science, but the researcher focused on Maths because it is the area of specialization of the researcher. The study covered the two SAMSE program objectives for primary schol Instructors and learners in Maths. Also, ten local government areas and forty schols were covered in the study. Kirkpatrick four-level evaluation trianing model was used. The study examined the following variables: Age, Academic qualification, Years of taeching

experience, Instructors' knowledge and perception of SAMSE program, Instructional approach used by SAMSE program Instructors, Schol location, Teacher gender, Learners' gender, Learners' disposition to Maths, Learners' achievement in Maths, Instructors' disposition to Maths taeching and Instructors' taeching effectiveness.

1.7 Significance of the study

The result of the findings of provides the SAMSE program initiators and implementers' empirical evidence on the length that the SAMSE program's objectives have been attaineds. The anticipated findings of this study will pave way for improving the skills, efficiency, and effectiveness of primary schol Instructors in taeching of Maths. Through the SAMSE program Maths taeching will be entrenched in the system, and will in turn improve the performance of primary schol learners in learning of Maths. More so, the study will popularize the SAMSE program among the populace. The study has implications for the government at various levels, in the sense that the results would propel the government at federal, state and local levels to institute a mechanism for the continuation of trianing and re-trianing program for primary schols science and Maths Instructors. Also, the findings of the study would add to the existing literature on the SAMSE trianing program. Specifically, the study will provide the government and other stakeholders information on how the Maths Instructors could be helped to teach the learners more effectively than the way they handle the learners' taeching and learning before.

1.8 Operational Definition of Terms

Achievement in Maths: A measure of pupil's performance in Maths test in which the cut off mark for learners' success is 25 out of 50marks and it is reflected in learners Maths Achievement Test (PMAT) instrument.

Disposition to Maths: This refers to pupil's disposition to learn or not to learn Maths. The bench mark for learners positive disposition towards Maths learning is 54 out of 108 and it is reflected in Learners Disposition towards Maths Learning Scale (PATMLS).

Disposition to Maths Taeching: This refers to teacher's disposition to the taeching of Maths. The cut off mark for disposition towards taeching as expected of a good teacher is 40 out of 80 as reflected in Teacher Disposition towards Maths Taeching Scale (TATMTS).

Conceptual Definition of Terms

Year of Taeching Experience: This is the experience the teacher acquires during the course of taeching and learning. It is reflected on the item six of Instructors Disposition towards Maths Taeching Questionnaire (TATMTQ).

Gender: It is a variable that consists of boy and girl. Their disposition towards Maths and Achievement in Maths are measured.

Qualification: This is the academic qualification obtained by the teacher and it is reflected on the item seven of Instructors Disposition Towards Maths Taeching Questionnaire (TATMTQ).

Teacher Effectiveness: It is the degree to which the teacher is successful in taeching and producing desire result in the learner such Instructors must have knowledge of subject mastery, positive disposition towards taeching, competency, class management, performance skills and good lesson preparation. All these are reflected in strengthening Maths and Science Education Program Approach Observation Scale (SAMSEPAOS).

Pedagogical Strategies: These are various methods and approaches in taeching Maths to learners. It enables learning to take place and it is also an interactive process between Instructors and learners. This is reflected in Strengthening Maths and Science Education Program Approach Observation Scale (SAMSEPAOS).

Teacher Centred: This refers to a taeching-learning situation in which the teacher dominates all the taeching learning process and activities including introduction, presentation in steps, evaluation and conclusion. This is reflected during the practical taeching.

Pupil centred: This refers to a taeching-learning situation in which attention is focused on learners by the teacher during the taeching and learning process. This is reflected during the practical taeching.

Activity Based Learning: This refers to a taeching learning situation in which learners are duly involved by engaging them in a series of class activities that can facilitate easy comprehension of knowledge. This is reflected during the Maths taeching in the classroom.

Schol location: This refers to the environment schol is built, either rural or urban environment. It reflects in both Instructors Disposition Towards Maths Taeching Questionnaire (TATMTQ) and Learners Disposition Towards Maths Learning Scale (PATMLS).

CHAPTER TWO

LITERATURE REVIEW

Here, relevant literature review is thoroughly examined. To achieve this, the chapter is structured thus;

2.1 Conceptual Review

2.1.1 Taeching and Learning of Maths in Primary schols

2.1.2 The taeching of Maths and its Significance

2.1.3 Concept of Maths Achievement

2.1.4 The Roles of Instructional materials in taeching of Maths

2.1.5 Problems of the taeching and learning of Maths in Nigeria

2.1.6 Strengthening Maths and Science Education Program

2.1.7 Studies on re-trianing of Instructors

2.1.8 Concept of Evaluation

2.1.9 Evaluation Models

2.1.9 Kirkpatrick four level trianing evaluation model

2.2 Empirical Review

2.2.1 Instructors' qualification, experience, age and learning of Maths

2.2.2 Instructors' gender, disposition and learning of Maths

2.2.3 Schol location and learning of Maths

2.2.4 Instructors' taeching effectiveness, strategies and learning of Maths

2.2.5 Learners' disposition and learning of Maths

2.2.6 Learners' gender and learning of Maths

2.3 Conceptual framework

2.4 Appraisal of literature review and gaps to be filled

2.1 Conceptual Review

2.1.1 Taeching and Learning of Maths in Primary Schols

Maths was invented because man needs it to solve his domestic and economic problem. This is the philosophy behind the growth of Maths and it is also the basis of the philosophy of its taeching and learning. There is no straight definition of Maths unlike most subjects being taught in schols which are usually introduced to learners with a definition. Thus, Maths can be described as a subject that deals with the analysis and measurement of the tangible and intangible things around us (Raji, 2010).

Maths that is taught in the primary schol in the past was called arithmetic which involved mainly, the study of numbers and the applications of the four basic binary operations: addition, subtraction, multiplication and division of real numbers, usually positive numbers, and the use of numbers in mensuration and measurements. This later changed because people discovered with time that the day-to-day activities of every individual are more than just the Maths of numbers and the arithmetic laws. The new syllabi which contain the arithmetic of the past, together with some new ideas and topics came into being and these put together are now named primary Maths. The taeching of Maths in primary schols are broken into two broad goals

- Maths is taught in primary schol in order to acquit every individual for useful living in the society.
- To lay foundation of learners future advanced studies in Maths (National policy on education, 2004).

The two basic goals of primary Maths taeching revolve around the most important objectives of primary education which is to equip every individual adequately for life after schol. To ease understanding of the goals of Maths, the taeching and learning of it at the primary schol level are broken as follows:

- To help childen develop their abilities in the use of Maths, ideas in their daily life activities.
- To help childen develop positive disposition to the learning of Maths,
- To help childen develop logical thinking.

- To help childen to acquire basic knowledge and skills in numbers, quantities and geometrical figures.
- To provide a solid foundation for further learning of Maths (NPE, 2004, in NTI Modules).

Maths has a lot of uses but the following are few of them:

- Maths is a tool for solving operational problems in various industries due to its wide range of application.
- Maths is the language spoken by most sciences and a number of social sciences.
- Maths has impact on every aspect of human endeavor. (Raji, 2010).

There are a lot of techniques that have been adopted for the taeching and learning of Maths in order to achieve its laudable objectives in primary schol. Methods of taeching consist of a simple or complex set of procedure used in the learning process. Many of these methods had been applied in taeching and learning of Maths, yet low performance is still occurring. In as much as the learners' performance is not yet fully improved despite various taeching methods applied, there is still the need to search for the best taeching method that will improve the learners' performance. Also, in spite of the importance attached to the subject, past researches have shown that many people have phobia for the subject and that the rate at which learners develop interest in Maths is very low. Due to this, a lot of re-trianing program of taeching emanated purposely to improve the taeching and learning of the subject. This situation brought about the strengthening of Maths and Science Education (SAMSE) program to train both Maths and Science Primary Schol Instructors throughout the 37 states in Nigeria including the federal capital territory.

2.1.2 The Taeching of Maths and its significance

Three major components need to be looked at before the taeching and learning of Maths. These are the learner, the teacher and the subject matter. These three interact in a triangular manner through varied methods. Hence, before actual taeching, a good Maths teacher may find it necessary to ponder on his or her assumption and beliefs about how Maths is most effectively learned. A teacher needs to consider his or her responsibilities as analysed by Asiru (2010) as follows:

- Set out all the details as clearly and logically as possible.
- Stimulate students to make sense out of something for themselves.
- Provide motivation and application for the materials covered in the text.
- Cover all the techniques they will be tested on.
- Show students how to wrestle with Maths the way a Mathematician does.
- Startle and arouse in students dilemmas that they will have to resolve.
- Concentrate on techniques.
- Concentrate on meaning and understand display link between topics.
- Introduce new ideas and concepts.

Apart from the above responsibilities, a good understanding of the subject is very essential. A Maths teacher needs to have firm grip of the Maths content. Moreover, what is in vogue now is Active Learning Technique (ALT) whereby students would be at the centre of our taeching. Ashiru (2010) defined Active Learning as "Learning by Doing". He said, it is active learning when the students are actually doing something instead of listening. This implies that, in active learning the teacher facilitates rather than dictates. Ogunwuyi (2009) stated that facilitation by the teacher is described thus:

- Teacher supervises
- Teacher coordinates students activities
- Teacher motivates positively
- Teacher monitors progress
- Teacher encourages students to summarize, he also summarizes.

The principle of learning by doing applies to a child's thinking. It is an activity of the intellect, emotions and it leads to the development of a child's personality. Ashiru (2010) initiated a three part model that may be employed in facilitating active learning.

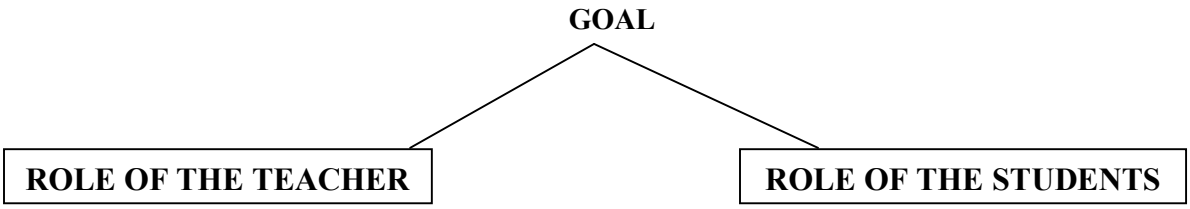

Fig 2.1: Three part model for facilitating active learning
Source: Paper presented in a three day workshop for Maths Instructors by Ashiru, 2010

Educational goal is very broad, the teacher needs to procure the behavioural objectives of the lesson from this goal which is directly measurable. Instructors are to break the curriculum and arrange topics in a sequential order for the taeching to be interesting. Adeleke (2010) stated that Instructors' responsibilities go beyond presentation of instructional content but sequencing it to support learning. He further posits that Maths Instructors should prepare their instructional content to include cognitive entry characteristics which should be sequenced to support learners achievement significantly in any target learning task. There are cases of some Maths Instructors skipping some topics in Junior classes forgetting that some topics in Junior Schol Maths are pre-requisites for Senior Schol Maths. A Maths teacher that has undergone proper trianing should be able to teach every topic in sequential order.

Ashiru (2010) stated that for a good lesson to be acquired depends on the taeching method employed. He ironed out five basic maxims that a good taeching method must satisfy

- Proceeding from known to unknown
- From concrete to abstract
- From particular to general
- From easy to the more difficult
- From simple to complex

It should be noted that our lesson presentation goes a long way in the taeching and learning process. Adeleke (2010) also indicated that there is the need for Instructors to use assessment tools for his/her students for the following reasons

- Diagnosis of learning difficulties
- Determination of the extent to which the behavioural objectives set have been achieved:
- Award of certificates
- Placement
- Assessment of a taeching methodology
- Accountability

Students need to follow the teacher's instruction in a series of articulated steps that will lead to the achievement of the lesson's objectives. Ashiru (2010) submits that taeching and learning effectiveness in the real sense is the Instructors and learners' ability to interpret the meaning of their subject and to develop insight into its creation.

This indicates that if a teacher is inconsistent, the learner will be poor. An effective teacher has some features that make him distinct from other Instructors. The following are the features that the effective teacher must possess.

- Good knowledge of his subject matter;
- Clarity of presentation;
- Ability to arouse curiosity;
- Ability to make learning application oriented;
- Ability to device sound questioning techniques;
- Ability to use simple language and communicate effectively;
- Ability to identify good learners, books and workbook for the taeching and learning of Maths.
- Five personal qualities such as patience, kindness and humour in taeching Maths.
- Love for Maths
- Ability to be resourceful and current: to be familiar with current taeching strategies, phenomena and discoveries in Maths which are often achieved by attending courses, conferences, workshops and others
- Problem solving techniques.

  Asiru (2010) explained further that taeching effectiveness is acquired not inherited; he then suggested that Maths teacher can improve or acquire taeching effectiveness through the following.

- Regular practices and punctual attendance at lessons;
- Preparing lesson well before going to class;
- Taeching with the aid of appropriate instructional (Maths) materials, apparatus or equipment.
- Answering learners' questions.
- Checking learners, learners' notes periodically, marking and providing them with feedback;
- Encouraging learners to explore in the subject beyond what is learnt in the classroom;
- Knowing the subject matter well and simplifying the taeching so that virtually every member of the class can understand; and
- Varying taeching strategies and using good Maths textbook.

According to Ilori (2003), in his paper titled on "Effective taeching and learning of Maths in the free education program-implications for students, parents and society", the subject, Maths has long been recognised universally as indispensable to modern living. That is why it is made a compulsory subject both at the primary and secondary schol levels of education. As part of the stakeholders, students, parents/guardians and society have their parts to play for the effective taeching and learning of the subject in the free education program. Ilori further stated that the general performance of our students in Maths has not been encouraging; the percentage of credit passes in SSCE Maths, (and another science related subject-physics) has always been around 20% which is far below those of other subjects. Ilori stressed further the usefulness of Maths to the students, parents/guardians and society in order to have considerable improvement in the performance of students as thus:

- Maths to everyday living especially in the area of estimation.
- Maths vis-a-vis choice of career. Students need to be constantly reminded of the requirement of a credit/pass in Maths with regard to the professions of their choice.
- Maths as a language: Maths has its own registers; vocabulary and grammar. Students should be made aware of this fact that they need to learn the technical terms in Maths, their meanings, definitions and uses.
- Cumulative nature of Maths: It depends on previous knowledge of the subject, such that, building on a weak and shaky foundation is a useless exercise.
- Implications of Maths to other subjects: Maths is known to have implications on other disciplines. A good knowledge of Maths helps tremendously in the understanding of other subjects. This would motivate the learners in their effort to understand Maths, because of the obvious benefits to other subjects.
- Real life nature of Maths: Maths evolves from man's attempts to find solutions to real life problems. Therefore, the methodology recommended for taeching the subject needs to begin from the concrete material level and real life situations. This relationship between Maths and real life should serve as a strong motivation to encourage students to take the subject seriously.
- Support and appreciation by society on the importance of Maths: Ilori (2003) expressed further that Maths is not only the queen of the sciences, but it is also the language of

sciences and technology (S + T). Maths as the foundation of S+T is also a pre-requisite for the study.

However, there are many problems confronting the taeching and learning of Maths in Secondary Schols. The state of Maths in Nigeria was aptly described by Chief Folake Solanke (SAN) at the Obafemi Awolowo Birthday lecture series held at the Institute of International Affairs on March, 1991, when she said that without Maths, which appears to pose difficulties for many students, no country can achieve technological upliftment. She was of the opinion that our childen must be assisted to cultivate the discipline of Maths because apart from it being a fascinating subject, Maths sharpens the intellect and develops analytical power in the learners. She reiterated the need for the Nigerian to pay rapt attention.

Maths taeching is as important as Maths itself. If Maths is so important that man cannot do without it, then the effectiveness of its taeching should equally be important and given the necessary concern. Maths taeching has some objectives and goals to achieve. The National objectives of Maths education in secondary schols are well known as stated by Adeniran (2003) as follows:

1. Preparation of a child for higher education;
2. Generation of interest in Maths and provision of sound foundation in the subject;
3. Development of computational skills;
4. Fostering the desire and ability to be accurate to a degree relevant to the problem at hand;
5. Development of precise logical and abstract thinking;
6. Stimulating and encouraging creativity and
7. Development of ability to recognise problems and solve with related mathematical knowledge. Maths also has the following goals to be advanced (if properly taught);
8. Helping the child to explore and understand the world around him by developing competency and understanding the basic skills for dealing with numbers and shapes;
9. Helping the child to be able to compare and contrast objects quantitatively thereby developing in the learner, the habit of effective thinking;
10. Helping the child to communicate his thoughts through symbolic expressions and graphs.
11. Helping the child to develop the ability to distinguish between relevant and irrelevant data.

To achieve these goals, there must be effective ways of communication between the teacher and learner. Hence, the need for qualified Maths Instructors' who are well- grounded to

perform the role of a good facilitator in the taeching and learning process of this subject. Ayeni (2003) submitted that Maths was developed by Priests in Egypt about 5,000 years ago because they – the Priests had leisure and there was the need to measure the arable land around the River Nile.

Adebayo (2007) cited in Ohaegbue (2013) posits that the use of Maths pervades such that it occupies a central position among schol subjects. Maths is the gate way to making progress in all facets of life. It shuts the door against ignorance, disease, illiteracy, untimely death and other negative incidences of life. Maths is useful in Science, Accounting, Medicine, Social Sciences, Engineering and Technology (to mention some obvious areas). Maths is also useful in managing time, organizing activities, evaluating priorities and making effective decisions among alternatives. Maths is now being applied to the analysis and solution of day to day problems. In spite of the importance attached to Maths, it is disheartening to make the persistence low performance of the learners in Maths which needs to be critically examined

2.1.3 Concept of Maths Achievement

Maths achievement can be described as the degree of success in attaining mathematical knowledge. It is measured through the achievement tests scores of students.

However, Joshua, Joshua and Kritsonis (2006) argue that learners' achievementscores represent many things which require many assumptions to link them to Instructors' performance and effectiveness. Students' Maths attainment is often associated with the future economic power and competitiveness of a country due to the importance of Maths to every facet of life. Therefore, for a country to develop economically, it is necessary for the governance to have good knowledge in Maths.

various studies result have shown that home background of students in schols is related to their Maths attainment (Bos and Kuiper, 1999; Brese and Mirazchiyski, 2010; Chiu and Xihua, 2008; Lamb and Fullarton, 2000; Marks, 2006). In a study, that covered five aspects of home background: (have possessions, immigration status of students and their parents, language use at home, parents' education and parents' employment situation), the results revealed that there were quite a few variables which showed strong or moderate association with Maths achievement, and these were parents' education, number of books at home, number of students' own books and computer at home (Brese and Mirazchiyski, 2010). It has also been realised in other studies that the deplorable state of Maths achievement is attributed to a number of factors

such as disposition of students (Uhumuavbi and Umofu, 2005); poor instructional resources (Yara and Oliem, 2010) among others. In addition, it has also been confirmed that Instructors' verbal ability or intellectual ability always correlates with students' academic performance (Olatunde 2014). Better Maths achievement may not be established properly if there is no cordial relationship between the teacher and students and this usually emanates in the schol system.

Schol is a place where future leaders are groomed. It is a place where students' behaviour, disposition and future endeavours are shaped. It is also a place where Instructors and students interact and relate together to achieve a common goal. In the schol system, the teacher imparts knowledge, skills and dispositions to the students, while the students receive and imbibe same (Nwawo (2013). This interactive relationship between the teacher and the student is meant to result in some permanent changes in the students' behaviour. If taeching-learning process is to work effectively, a unique kind of relationship must exist between these two separate parties. There must be some kind of connection, link or bridge between the teacher and learner because Instructors are low parentis to the students. Available literature, reveals that the teacher-student relationship has been identified to have significant influence on overall schol and behavioural adjustment (Baker, Terry, Bridges and Winsor, 1997).

Moreover, Nwawo (2013) expressed that Instructors must win their students' hearts while getting inside their students' heads. In addition, Nwawo (2013) stated that this winning of the hearts occurs through very personal interactions, one student at a time. Nwawo (2013) found that Instructors who develop such relationships experience fewer classroom behaviour problems and better students' academic performance. The teacher who is pro-active in demonstrating acceptance, understanding, warmth, closeness, trust, respect, care and cooperation towards his or her students not only works at initiating positive teacher-student relationships, but also increases the likelihood of building strong relationships that will endure over time (Barry and King, 1993).

2.1.4 The Roles of Instructional material in the taeching and learning of Maths

Fatoke, Ogunlade and Ibidiran (2013) examines the usefulness of available locally improved instructional aids to achieve the same goal. The usefulness of instructional materials in taeching and learning Maths are summarized thus:

- They enhance a quick mastery of mathematical concepts
- They minimize the amount of talking by the teacher, thus making taeching more interesting and motivating.
- They help to bridge the communication gap between the teacher and his students thus making his lesson more explanatory to his students.
- They create a high degree of interest in students which is necessary to stimulate learning as all the five sense organs are being employed
- They make the learning of Maths more real rather than being abstract.
- The students are afforded the opportunity of using their sense organs towards effective learning.

Since the attainment of ICT in the taeching and learning process is costly and sophisticated materials for taeching and learning are scarce to come by, Fadeiye (2005) proposes the need for Maths Instructors and learners to begin to look for alternatives to sophisticated and imported instructional materials. Some of the things that could be done include improvisation of learning resources and establishment of a Maths laboratory.

Fadeiye (2005) said no government, be it federal, state or local or even the proprietor of schol can adequately or satisfactorily provide all the needed taeching aids for effective taeching and learning of Maths, particularly with the down turn in the economy that makes it extremely difficult for government to fulfill its obligation to its citizens. Though aids like video tape, overhead projector, films and films strips, tape recorder may not readily be at the Maths teacher's disposal, he can at least be resourceful and use the local materials within his reach such as cardboard, clay, and etc, to improvise materials like pictorical illustrations, diagram, charts, models and etc, which would be kept in the Maths laboratory for good mastery of Maths content by the learners.

Sequel to the declining nature of the country's economy and the necessity of using relevant aids to facilitate of learning, the National Commission for Colleges of Education (NCCE) had included a course titled and coded Maths practical laboratory (MAT 124) into the

NCE curriculum, aimed at constructing the needed aids for the taeching and learning of Maths. It is a self-help workshop for students to fabricate the needed taeching aids particularly for primary and JSS Maths topics since they are being trained as Instructors that will handle these levels of the nation's education.

As a follow-up to the above, every institution in Nigeria, be it primary, secondary or post-secondary should as a matter of urgency possess a Maths laboratory well equipped with useful tools for the construction of improvised aids needed for the taeching and learning of Maths.

2.1.5 Problems of taeching and learning of Maths in Nigeria

In the Nigerian context, Ibebuike (1999) had noted that many students, even as far back as their primary schol days did not take interest in Maths to a meaningful degree; he remarked that the methods of instruction were not very favourable to these students. He posited that this was due to the paucity of competent and adequately qualified Maths Instructors who were invariably over labored. Arguing further, Iwuola (2007) identified lack of thorough grooming in Maths concepts; unsuitable taeching environment, wrong evaluation techniques by both Instructors in schols and WAEC's lack of incentives to Maths Instructors as major factors that caused low Maths achievement.

The chief examiners' reports of results of public examinations, for example (WAEC, 2003-2008) had shown a marked decline in the percentage of passes in Maths. Ahiakwo (2006) found that the performance of various levels of students had decelerated over the years especially in Maths achievement with that of Nigerian childen being quite remarkable. There is a perceived risk that the percentage of failures in secondary schols and in universities is greater in scientific matters than in others. STAN (1992) has earlier outlined a number of factors responsible for students' poor performances in science disciplines and Maths in particular. These included the nature of science curricula, Instructors' methods of taeching, the parents disposition, the government is 'up service' to the subject and lack of science facilities in schols amongst others.

Ojo (2004) in his paper "Improving Maths taeching in our schols" identified the teacher problems as one of the major challenges of taeching Maths.

2.1.6 Strengthening Maths and Science Education Program (SAMSE) and taeching and learning of Maths

The Federal Government of Nigeria (FGN) through the Federal Ministry of Education (FME) in collaboration with the Government of Japan through Japan International Cooperation Agency JICA intensified more efforts in organizing another project tagged SAMSE, that is, Strengthening Maths and Science Education to train the Instructors at all the three levels of government (National, State and Local). Japan international cooperation agency has helped to establish sustainable and quality in-service education and trianing (INSET) for Maths and science Instructors in some African countries like Kenya, Uganda, Malawi, Zambia, Niger, Rwanda, Senegal, Burkina-Faso, Ghana and South Africa.

In 2005, the Federal Ministry of Education and JICA conducted a baseline study to determine the status of Maths and Science in selected primary schols in Nigeria. The study revealed that schols were facing serious challenges in taeching/learning of basic Maths and Science. The Instructors engaged themselves in chalk and talk strategy which reduced learners to passive listeners in the class. This confirmed that there is a strong association between low taeching capabilities and poor performance. Thus, there was the need to re-establish a strong system of re-trianing of Instructors in the area of Maths and Basic Science at the primary schol level. The Federal government of Nigeria through the Federal ministry of education mandated National Instructors Institute to conduct and monitor the re-trianing of primary schol Instructors through the Strengthening Maths and Science Education program (SAMSE).

The National Instructors' Institute, Kaduna is a single mode distance education institute dedicated to teacher trianing. It was established in 1976, primarily because of the pressing needs in the country for trained and qualified taeching staff at all levels of the educational system.
Act number 7 of 10th April, 1978 which establishes the Institute, is charged, among others roles, with the responsibility of providing courses of instruction leading to the development, upgrading and certification of Instructors as specified in the relevant syllabus using DISTANCE EDUCATION TECHNIQUES. The SAMSE National INSET centre was moved from the National Commission for Colleges of Education (NCCE) to National Instructors' Institute (NTI). This was due to the mandate for establishing the institute. The NTI was established among other things to upgrade under-qualified and untrained Instructors and organize workshops, seminars and conferences which would assist in improving of Instructors quality.

The main goal of SAMSE is to upgrade the capability of Instructors in Maths and Science subjects while the vision is to become a regional center for upgrading taeching skills of Maths and Science Education Instructors. The mission of the program is to deliver institutional in-service education and trianing (INSET) to Maths and Science Instructors on effective curricula delivery.

The SAMSE program was set to pursue in-service trianing of existing Maths and science Instructors as a tool for strengthening the subjects. Phase 1 of the project started in 2006 with three pilot states namely Kaduna, Plateau and Niger. Six hundred (600) core Instructors (CTs) were trained in the three states during the 1st phase of the project. The success of the project in the pilot states led to the formulation of phase II in 2010. The aim was to scale-up the project to 33non-pilot states and federal territory (FCT) and cascade to local level in the pilot states. During phase II, 34,574 primary schol Instructors were trained in the three pilot states. As at October 2013, 423 state trainers (STs) and 3,000 core Instructors CTs in 14 non-pilot states, including Oyo state and the FCT, have been trained (SAMSE Nigeria inset guidelines January, 2014).However, records have shown that learners' performance in Science and Maths is still generally low. This is mainly because the taeching and learning of Science and Maths is to a large extent theoretical and teacher centered.

SAMSE Nigeria program came into being to address some of the deficiencies emphasizing a shift from teacher-centred to pupil-centred, theoretical to activity-based learning and negative to positive change in dispositions. In teacher-centred approach, all the taeching learning activities in the classroom are usually dominated by the teacher handling the subject but for pupil-centred approach, all the taeching learning process must be focused on learners and they must be fully involved.

SAMSE trianing levels

i. Internal Trianings

SAMSE through (JICA) provides trianing opportunities to Japan, Malaysia, and Kenya to the following categories of people

- SAMSE stakeholders' administrators from SUBEBS, FME, UBEC, TRCN, NERDC, NTI and MC
- National and state trainers and core Instructors from NTI and SUBEBs.

ii. National Trianings

NTI provides National SAMSE trianing to Maths and Science Instructors at all levels to serve as master trainers.

iii. Zonal trianings

Master trainers provide SAMSE trianing to select Maths and Science core Instructors from their respective zones across the federation and FCT. National trainers provide technical support during the zonal/state level trianing.

iv. Schol Based Trianing

The SAMSE trained Maths and Science core Instructors and they are expected to scale down the trianing to the rest of the Maths and Science Instructors in their respective schols (Schol Based Trianing). (SAMSE Nigeria inset guideline January, 2014)

Types of SAMSE Trianing

SAMSE trianing is divided into three (3) cycles of trianings. Each cycle is conducted within a year. The cycles are:

Cycle I: Deals with enhancing positive disposition of Instructors and learners towards the taeching and learning of Maths and Science.

Cycle II: Deals with enhancing classroom/laboratory activities for the effective taeching and learning of Maths and Science.

Cycle III: Is concerned with the actualisation of ASEI—PDSI technique in the taeching and learning of Maths and Science. ASEI means to ACTIVELY involve STUDENTS (learners) through EXPERIMENTS and demonstration IMPROVISING by utilizing locally available materials in the classroom/laboratory.

PDSI stands for plan, Do, See and Improve Cycle for lesson improvement.

The SAMSE approach was extracted from the strengthening Maths and Science Education Program (SAMSE program) which was established to pursue in service trianing of existing Maths and science Instructors as a tool for strengthening the subjects. There is one taeching approach that was emphasized by SAMSE program, this is ASEI-PDSI (Activity, student, experiment and improvisation) and (plan, do, see and improve) focused on learner centred preparation and presentation of lessons and this approach is divided into two stages. The first stage (PDSI is applied purposely to improve the lesson and there are some steps to follow when applying PDSI.

- Conduct curriculum and topic analysis, to clarify the performance objective(s) of the topic and to identify their logical flow.
- Set objective (s) of the lesson.
- Identify suitable activities in the logical sequence to achieve the objective. Develop an ASEI lesson plan.

The following are the structure of PDSI

Plan: Instructors are to be paired together for curriculum content analysis after which they write a comprehensive lesson note on a given mathematical concept (lesson preparation).

Do: Lesson note written should be used by peer taeching among the Instructors (lesson practice).

See: Teacher's taeching should be observed by other Instructors for thorough assessment (peer taeching).

Improve: There should be review of the teacher's taeching by other members by giving constructive criticism purposely to improve lesson to be practised in real classroom.

The second stage (ASEI) lesson aims at promoting effective learning through meaningful engagement of learners (minds-on and hands-on). The following are the features of ASEI lesson:

Activity: Teacher should select learners' activities that effectively enhance participation, interest, understanding and retention of knowledge and skills.

Student centred: Learners should be given the opportunity think, express, exchange their ideas or check their achievements. Lesson must be planned and implemented to promote pupil's participation.

Experiment: Simple experiment should be used in class. Learners learn more effectively through real experience, such as touching objects, feeling temperature, perceiving and observing. 'Chalk and talks' chorus answer may be efficient but may not effective.

Improvisation: Some learners' activities require instructional materials. Instructors have to obtain skills to improvise taeching and learning materials from locally available resource. (FME SAMSE Nigeria inset guideline January, 2014)

Facilities at the SAMSE National INSET centre

To support the trianing needs of SAMSE participants, the National INSET center is equipped with the following facilities: Wi-Fi enabled environment; a 150 capacity auditorium; a 500 capacity auditorium; modern integrated science laboratory; ICT laboratory; Maths trianing rooms; science trianing rooms; participants' hostels; a standard dinning hall etc.

Executing Bodies

- Federal Ministry of Education (FME)
- National Instructors Institute (NTI)
- National Commission for College of Education (NCCE)
- Universal Basic Education Commission (UBEC).
- State Universal Basic Education Boards (SUBEBs).
- Local Government Education Authorities (LGEAs) in all states of the federation including FCT and Japan International Cooperation Agency (JICA).

Collaborating Bodies

- Nigeria Educational Research and Development Council (NERDC)
- National Mathematical Centre (NMC)
- Instructors Registration Council of Nigeria (TRCN) (NTI leaflet 2002)

Prior to the SAMSE re-trianing program, the Federal Government of Nigeria has undertaken several measures aimed at providing professional support for Instructors, one of which is the implementation a state-wide capacity building program for primary schol Instructors under the Millennium Development Goals (MDGs) project since 2006. The ministry's choice of

this strategy is based on the belief that the MDGs goal of Education For All (EFA) is meaningless if the childen cannot have way to quality education. The goal of universalizing access is being addressed through the introduction of Universal Basic Education (UBE) program, equality is addressed through the re-trianing of Instructors. The Federal Ministry of Education mandated the National Instructors Institute to design and mount a nation-wide retrianing program for primary schol Instructors across the country and even included the Instructors of the junior secondary schols in the trianing exercise from 2011.

The objectives of the capacity building are to:

- disseminate innovative practical skills that will enhance the Instructors' effectiveness and promote greater mastery of the subject matter by learners;
- update the Instructors knowledge of subject matter;
- contribute to the development of positive disposition and self-concept by the Instructors; and
- enable Instructors to make learners see learning as an interesting and pleasant activity promote the development of self-understanding, inquiry and critical abilities:

In the course of carrying out this program over the years, the institute encountered some challenges which are:

- delay in the submission of list of nominees by states.
- repeated nominations of Instructors that have taken part in previous workshops.
- delay in the release of funds causing wrong timing of workshop conduct.
- difficult terrain and far distant centers in some states making it difficult for participants from such areas to access the program.
- deplorable condition of toiletries in some centres
- delay in the payment of some participants due to various problems such as lack of or wrong bank account numbers and insufficient bank details. (NTI Manual for Retrianing Primary Schol Instructors, 2006)

All these challenges encountered during the conduct of the workshops are being taken care of by taking concrete steps to eradicate while planning the subsequent trianing workshops.

The role of the teacher as major determining factor in the quality of education is of great importance. As a curriculum implementer or and guide to the learners, it is necessary for the teacher to know what to teach, how to teach it and to ensure that learning takes place, but in

Nigeria today, there is an acute shortage of qualified Instructors in the schol system. The few qualified ones lack opportunities to update themselves in both knowledge and pedagogy. Majority of Instructors in the schol system have not received any form of in-service trianing since they graduated from schol. These Instructors are therefore no longer current with innovations in instructional strategies and other research based developments in taeching and learning. Since one cannot give what one does not have, the situation raises quality issues in the system.

In order to ensure the goal of achieving quality education at all levels, it is necessary and urgent to put in place a systematic and a planned program that ensures that all Instructors are regularly trained and re-trained for the purpose of updating their knowledge and skills.

2.1.7 Studies on re-trianing of Instructors

Babatunde (2013) asserts that re-trianing program is one of the important programs needed by any organization to upgrade the knowledge and skills of all the participants involved. Trianing is a tool that is inevitable for the development of staff competence. Re-trianing will instill confidence in Instructors to learn more important skills in their subject areas. From the base line study conducted by a federal government of Nigeria, the result obtained revealed that Instructors still rely on 'chalk and talk' strategy which made learners to be passive listeners. This brought about the re-trianing program in our primary schols in Nigeria.

Babatunde (2013) evaluated the NTI/MDGs re-trianing program for primary schol Instructors of English Language in Oyo State. She adopted C.I.P.P model and used multi-stage sampling technique in selecting ten local government areas and six primary schols from each local government area selected. She made use of seven instruments to elicit the participants response while four research questions and four hypotheses guided the study. Data were analysed using descriptive statistics, t-test and multiple regressions.

The researcher discovered that NTI/MDGs program had significant effect on pedagogical strategies in English Language taeching exhibited by the beneficiary group compared to non-beneficiary group in oral, writing, reading and grammar. Learners of the program beneficiary group performed better than those of the non-program beneficiary group. Also, Instructors in the beneficiary group also had better mastery of the subject content with regard to oral, writing, reading and grammar than those in the non-beneficiary group. Furthermore, the disposition of

Instructors in the beneficiary group was significantly better than the disposition of Instructors in the non-beneficiary group and material utilization was the most influential predictor of beneficiary subject mastery score.

In another related study, Mwangi and Mugbambi (2013) examined evaluation of strengthening of Maths and Sciences in secondary education (SAMSE) program; A case study of Murang'a South District, Kenya. The study involved five schols in Murang'a South District which were selected through convenience method. The study targeted the Instructors of Science and Maths, learners, SAMSE trainers, principals, District Quality Assurance and Standards officer Murang'a South District and the trianing program itself. The study adopted the Kirkpatrick model of trianing evaluation. Questionnaires and observation schedule were used to collect data.

The study revealed that there was significant improvement in performance in Science and Maths subjects and that a lot needs to be done to improve the disposition of Instructors. It was discovered that majority of Instructors are coerced to attend the inset trianing and that few Instructors are willing to be observed by others during taeching and learning while modern technology, i.e the use of ICT is rarely adopted.

Olanloye (2018) examined evaluation of the Universal Basic Education Teacher development in South-west Nigeria (UBE– TDP). He adopted C.I.P.P evaluation model and used a simple random sampling technique to select three states, one senatorial zone from each state and four local government areas from each zone. Also, he employed UBE-TDP Resource persons' scale, Assessment of the UBE-TDP Questionnaire, UBE – TDP objective Questionnaire, UBE officials Questionnaire, Taeching Dimension Observation Protocol, Instructional Competence Rating Scale, English Studies Achievement Test, Maths Achievement Test, Instructors' Knowledge of Subject Matter Test (English Language and Maths). T-test and multiple regression of ≤ 0.05 were used to analysis the data generated.

The study revealed that Activity-based, discussion and teamwork methods were mostly used. UBE-TDP had significant impact on the Instructors' pedagogical competence. Taeching method, pedagogical moves, teacher-student interaction, cognitive engagement of students, promotion of positive self-concept in learners, Planning, use of instructional materials, lesson introduction, content-communication and organization.

Furthermore, beneficiary Instructors scored higher, compared with non-beneficiary Instructors in knowledge of subject matter. Also, Maths Achievement of students of UBE-TDP beneficiary Instructors was significantly better than non-beneficiaries, while there was no difference in English studies achievement. He concluded that the Universal Basic Education Teacher Development Program was effective in improving beneficiary leaders' competence, their knowledge of subject matter and learners' achievement in Maths and that UBE-TDP should be regularly organized for teacher improvement.

2.1.8 Concept of Evaluation

According to Oyinlola (2014), evaluation is a theoretically informed approach and consequently a definition of evaluation could be tailored to the theory, approach, needs, purpose and methodology of the evaluation itself. She further posits that evaluation is the systematic acquisition and assessment of information to provide useful feedback about some objects. The object here could be referring to a program, policy, technology need, activities. Evaluation work involves collecting and sifting through data, making judgement about the validity of the information of inference we derive from it. Hence, the reason for evaluating someone or something at times, is to measure the worth, quality, importance, relevance, performance with a view to pricing, rating, correcting, improving or changing it. Evaluation is a feedback mechanism which enables one to find out whether or not a program's goals are being achieved. Evaluation enables the evaluator to identify the strength, weakness, opportunities and threats of a program.

Program evaluation is one of the major concerns of educational evaluators. Evaluation should produce true, relevant, credible and objective findings and conclusions in a program's performance based on valid and reliable data collection and analysis. Obemeata (2005) stated that evaluation can be said to be successful only if the result obtained forms part of the decision making process of findings and the extent to which the goals of a program are being achieved. Akinyemi (2012) stressed that evaluation must deal with both the intended and unintended impacts of the program.

Evaluation could either be formative or summative. Scriven (2001) said that formative evaluation may be defined as the type of evaluation that aids and guides the development and implementation of a program. This is a type of evaluation most appropriate during the planning

and implementation stages of a program. It is a kind of evaluation that should be largely internal though external bodies may also participate and it is a type that should be built into a progrmame right from the planning stage. Its major purpose should be to maximize the chances of success of the program. It also identifies potential problems of a program's activities, processes and modifies defective aspect of the program (Akinyemi, 2012).

Summative evaluation is an evaluation carried out at the terminal stage of a program. It is based on the overall effectiveness of a program for the purpose of making value judgement or worth of the outcomes of a program. Summative evaluation is broader in scope because proper summative evaluation should concern itself with both planned and unplanned outcomes and therefore the standards for evaluation are not limited to those set in the original objectives. This is conducted for the purpose of accountability which requires determining the overall effectiveness or merit and worth of an evaluation object.

2.1.9 Evaluation Model

Evaluation model is a plan which enables a researcher to execute evaluation successfully. Models are like guides and they in fact guide the evaluation. Evaluation models can be used to help define the parameters of an evaluation, what concept to study, and the process or methods needed to extract critical data. Oyinlola (2014) described evaluation model as a (a pictorial) path way which has been found to be workable within a design. There are a wide variety of evaluation models which prescribe what evaluators ought to do and explain how to conduct a particular type of evaluation. In evaluating a program, models are usually used.

2.1.9.1 Kirkpatrick's Four Level Trianing Evaluation Model

Kirkpatrick's Four Level Learning and trianing evaluation model was named after the propounder Donald Kirkpatrick (1924-2014) who was a Professor Emeritus, University of Wisconsin. He first published his ideas in 1959, in a series of articles in the journal of America society of trianing directors. The articles were subsequently included in Kirkpatrick's book evaluating trianing programs originally published in 1994; now in its 3rd edition. He propounded four levels of learning and trianing evaluation: reaction, learning, behaviour and results. Each successive level of the model represents a more precise measure of the effectiveness of a trianing model. The trianing was further developed by Donald and his son, James and later by James and his wife, Wendy Kayser Kirkpatrick. In 2016, James and Wendy revised and categorized the

original theory, and introduced the "New World Kirkpatrick Model" in their book, "Four Levels of Trianing Evaluation". One of the main additions is an emphasis on the importance of making trianing relevant to people's everyday jobs. The Kirkpatrick's Evaluation Model has been the model widely recognized and used for evaluating trianing programs. Kirkpatrick's Model asserts that trianing program effectiveness can be evaluated by looking at four separate levels. The four levels are Reaction, Learning, Behaviour, and Results. The major question guiding this kind of evaluation is "What impact did the trianing have on trainees in terms of their reactions, learning, behavior, and results?"

The four levels of Kirkpatrick's evaluation model essentially measure:

Reaction: This has to do with what the trainees think and feel about the trianing that is how trainees react to trianing. Reaction measures how trainees react to the trianing.

Learning: This concerns trainees increase in knowledge or intellectual capability during and after the trianing. It means the extent to which trainees change disposition, increase knowledge, and\ or increase skill. Learning analyzes if the trainees truly understood the trianing.

Behaviour: This refers to the extent of behaviour and capability improvement and implementation/application. It implies the extent to which change in behavior occurs. Behaviour looks at if the trainees are utilizing what they learned at work.

Results: These interpret attainments at appropriate stages within a program that is, it looks at the effect of the trianing resulting from the improved performance of the trainees. In a nutshell, this is the final result of the trianing. Results determine if the material had a positive impact on the business/organization or otherwise.

Table 2.1: Kirkpatrick's four levels of trianing evaluation

This grid illustrates the basic Kirkpatrick structure at a glance.

Levels	**Aims**	**When done and by whom**	**Methods**	**Action**
Reaction	To find out how trainees react to trianing	During trianing and/or completion of training	Daily review, questionnaire completed during or at the end of trianing	First aid treatment to trianing program and content
Learning	To find out if trainees have increased their knowledge and/or developed their skills and dispositions as a result of trianing	During trianing or at the end of trianing	Tests, exercises case studies, oral questions etc	Remedial treatment for individual retrianing, reinforcement change/review methods
Behaviour	To find out how former trainees have applied learning job performance. To find out how well trianing has met their needs.	After an interval which allows learning to be put into practice on average (2-3) months after trianings	Past questionnaire and/or interview with former trainees and their managers/trainers	Continuous development and updating of trianing content on response to changing needs.
Result	To find out the extent to which trianing has improved or influenced trainees	Periodically, after sufficient time has passed for trianing outcomes to have had an effect on the trainees.	Past questionnaires, interview with formers trainees	Provide feedback on effect and values of trianing to the learners and the trainees.

Kirkpatrick Four Level Trianing Evaluation Model is currently being used for evaluating educational programs. All the four levels of Kirkpatrick trianing model are related to this work. The study looked at the reaction of the trainees either positively or negatively on the trianing program (SAMSE). Also, the study examined whether the learning gained changed the behaviour of the trainees and finally this study looked at whether the trianing received by the trainees have any impact on both the learners and the trainees' performances in the class.

2.2 Empirical Review

2.2.1 Teacher qualification, taeching experience, age and learning of Maths

Qualification

It is assumed that Instructors' effectiveness in the classroom setting depends upon the Instructors' certification. Adeniran, (2003) examined the inadequate supply of qualified Maths Instructors as a threat to effective taeching of Maths in the free education program. One hundred and fifty secondary schols in the Oyo state were randomly selected. The study shows that 100% of schols in urban centres had at least two arms in each class i.e. JSS 1 to SS 3, with at least one arm in the rural centres. Only 36% of sampled Instructors were degree holders in their schol and 64% of the Instructors were NCE holders. An average of 30 periods per week is allocated to a qualified teacher where there is no helper with an average of at least 60 students in a class. An average of 20 periods is allocated to a qualified Maths teacher who assists in taeching some other science subjects. Only 32% of the qualified Maths Instructors needed are available at present in schol. About 60% of the state schols send their Maths teacher to Mathematical Association of Nigeria (MAN) conference/workshop but not regularly, at least, once in a session. It has been observed however from MAN record, that most private schols send representatives regularly to MAN conference/meeting when they are notified of such conference/meeting. The result of the findings indicated that there was significant difference with supply of Maths Instructors in both urban and rural schols

Adefabi (1996) in Oyeniran (2003) paper presentation on 'The effectiveness of taeching and learning of Maths under free education program: Implication for Instructors', opined that the quality of a Nation's education industry depends on the professional qualification and occupational competence of its teacher. For the teacher to be effective in the classroom the teacher has to be professionally competent. This is in both subject matter and the methodology

of taeching the subject matter. But it is sad to note that many of our Maths Instructors are not professionally competent. In a study by NERDC cited in Salau (2000) about 24.9% of Maths Instructors' nation- wide are not professionally competent. 50.5% of the Maths Instructors hold NCE Certificate only and about 24.9% of them are HND/DEGREE holders. He added that to be able to arrive at where we hope to be, this picture needs to be given serious attention.

Bilesanmi (1999) by Olatunde (2014) found out that Instructors' qualification was highly significant in learners' achievement in Maths. More so, there are some studies that have found no significant relationship between teacher educational qualification and learners' achievement (Igwe 1985 and Osokoya 1996 in Olatunde 2014).

Elugbaju (2013) studied comparative analysis of students' performance in Maths between public and private secondary schols in Ibadan North local government area, Oyo state. The result revealed that Instructors' qualification contributed to the students' performance. A teacher who did not study Maths and education in the University will not have the basics of taeching professions and as such will always hamper the morale of students' interest in studying Maths. Majority of the secondary schol Instructors especially in public secondary schols are NCE holders for years who do not want to proceed further for their first degree to acquire more computing skills for better handling of their students. Furthermore, Babatunde (2013), in her evaluation of NTI/MDGS capacity program, revealed that majority of the Instructors involved in the program were NCE holders and that (90.0%) of them possessed qualification to teach in primary schol level.

Olojede (2013) investigated the effect of disposition of both Instructors and students towards Basic Science as determining factors of the students' performance. The participants were 100 students and 58 Instructors. An ex-post facto research design was employed. Three instruments were adopted. The result reveals that 17.6% of the Instructors hold NCE, 10% hold HND, 33.3% hold B.Ed and 3.3% hold M.Sc. It is clearly seen that majority of the Instructors have B.Ed degree but not all the Instructors are professionally qualified as some of them hold HND and B.Sc. yet they are involved in taeching Basic Science.

Most of the Maths Instructors in our secondary schols are not professionally trained. One can imagine someone who is trained as an Engineer, Pharmacist, a Biochemist and so on being recruited as Instructors for secondary schols. In the real sense of it, while some Instructors in this category may know some of the topics in the syllabus; they would definitely lack taeching

methodology. Failure rates then increases in Maths in our secondary schols today because many students are being taught by untrained Instructors (Odili, 1990). In a related study, Sangodoyin (1998) conducted study on the effect of teacher characteristics and taeching styles on students' learning outcomes in Secondary Schol Maths. Three hundred students in SSS III and one hundred Instructors were used. Both Instructors and Students Questionnaires coupled with Maths Achievement Test were the instruments used for the study. The data gathered were analysed by using regression and percentage. The research findings showed that there is no significant relationship between the NCE Maths Instructors and University degree holders with respect to students' learning outcomes in Maths.

The quality of education of a nation could be determined by the quality of her Instructors, the most important factor in improving students achievement in Maths is by employing seasoned qualified Instructors in all schols (Abe and Adu, 2003). Notably, the measurement of Instructors' preparation and certification are correlates of learners' achievement in Science and Maths. Abe and Adu (2003) opined that a taeching qualification or teacher qualification is an academic and/or professional degree that enables a person to become a registered teacher in primary and secondary schols. Such qualifications include, the postgraduate certificate in education (PGDE), Bachelor of education (B.Eds.) and Nigeria Certificate in Education (NCE). Instructors who are qualified are those that are professionally qualified. Academically qualified teacher refers to those who have academic trianing as a result of enrolment into education institution and obtain qualification such as HND, B.SC., B.A and MSc and so on. Professionally qualified Instructors are those who acquire professional trianing which equips them with professional knowledge, skills, technique and aptitude, different from general education.

In another related study, Oladokun (2010) investigated on a path analytic model of schol and teacher variables and primary schol learners' learning outcomes in Maths. The study adopted an ex-post facto type. One thousand, five hundred and forty-one primary six learners, 104 class Instructors and 104 head Instructors in 104 schols from 11 local government areas of Niger State participated in the study using multi-stage sampling techniques. Variables involved are class size, teacher's experience, teacher's specialization, teacher's qualification, teacher' self-concept, instructional leadership, learning materials, teacher's expectation, pupil's disposition, monitoring of pupil's progress and achievement, and they were analysed using mean, frequency count, regression analysis and path analysis. The results revealed that eight of the 10 predictor variables

had direct and indirect effects on learners' achievement in Maths. Among the eight predictor variables that had direct and indirect effects on learners' achievement in Maths are learning materials and students' disposition. Others are Instructors' qualification, Instructors' specialization, teacher's expectation, instructional leadership, monitoring of learners performance and Instructors' concept. It was revealed that learning materials constituted the most potent predictor of learners' learning outcomes in the study. Instructors' qualifications, specialization, and learners' disposition positively increased learners' achievement in Maths. In another study, Onabamiro (2010) pointed out that teacher qualification and the type of trianing acquired by the teacher affects pupil's performance in Science and Maths. Ogunwuyi (2000) also reviewed that qualification had only indirect effect on learners' achievementin Integrated Science.

Goldhaber and Brewers (2000) posit that students with a Instructors with degree in Maths had greater gains in achievement than students with Instructors without Maths degrees. More so, Tella (2008) showed no significant effect of Instructors' qualification on taeching effectiveness as a measure of academic achievement in Maths.

Adeyemo (2001) investigated the effects of job and life satisfaction commitment of secondary schols Instructors. The result showed that teacher qualification had direct causal influence on the teacher's job performance. Despite the importance attached to Instructors' qualification in taeching and learning process, it is sad to note that not all Maths Instructors are professionally qualified. In view of this, there is the need to ascertain the effects of Instructors' qualification on Maths achievement.

Taeching Experience

It is expected that the more years a teacher commits to taeching of a particular subject or a particular group of learners, the more expertise he/she is expected to demonstrate (Rowan, 2002). He found a significant effect of taeching experience on Reading and Maths outcomes in elementary schol, with larger effects for later elementary schol than early effects for later elementary schol. Nguyen, Wu and Gillis (2005) also report that learners whose Maths Instructors had more experience in taeching (more years of taeching) were more likely to perform better in both Maths and Reading. Adeyemo (2001), in his study revealed that taeching experience had direct casual influence on the teacher job performance.

In another related literature Ogunwuyi (2000) dealt with a thirteen variable model for achievement in secondary schol Integrated Science as a basis for providing a causal explanation for achievement in the subject and revealed that years of experience had only indirect effect on learners' achievementin Integrated Science. Olojede (2013) studied the effect of disposition of both Instructors and students towards Basic Science as determining factor of the students' performance. The participants were 100 students and fifty Instructors. An ex-post facto research design was employed. Three instruments were adopted. The data obtained were analysed using mean and standard deviation. The result indicated that 30% of the Instructors have below 5 years of taeching experience, 33.3% have six to ten years taeching experience, 30% have eleven to fifteen years of taeching experience while 6.7% have fifteen to twenty years of taeching experience. The findings show that there was a significant difference between teacher taeching experience and student's performance in Basic Science. Kimani, Kara, and Njagi (2013) concluded that Instructors' age, gender, professional qualification and professional experience did not have significant effects on academic achievements in secondary schols in Nyandama country. Hanushek (2011) discovered that Instructors' experience and age did not have statistically significant relationship with learners' academic achievement.

Emelda and Enose (2014) realized that Maths Instructors experience in taeching Maths ranged from 4 years to 26 years. 12 (38.7%) of Maths teacher had a taeching experience of 4 to 9 years, eight (25.8%) had a taeching experience of 15 to 19 years, 6(19.4%) had a taeching experience of 20 to 24 years, 3 (9.7%) had a taeching experience of 10 to 14 years and 2 (6.4%) had a taeching experience of 25 to 29 years. This distribution enabled the researchers to find out the relationship between Maths Instructors' taeching experience and students' academic achievement.

They concluded that a long taeching experience had positive significance on the learners' achievementin Maths. Akinsolu (2010) pinpointed out that Instructors who have spent more time studying and taeching are generally more effective and they develop higher order thinking skills for meeting the needs of diverse students, hence increasing their performance. Moreover, in Sangodoyin (1998), it was also revealed that there is no significant relationship between the Students' taught with different learning experience and students' learning outcomes in Maths.

Ewetan and Ewetan (2015) investigated the influence of Instructors' taeching experience on the academic performance of Public Secondary Schol students in Maths and English

Language in Ado-Odo/Ota and Ifo Local Government Areas in Ogun State. The study adopted descriptive research design; the study population comprised all the 31 Senior Secondary Schols in the selected two Local Government Areas. A sample of 20 schols were drawn from the population through the process of simple random sampling technique made up of 24 schols in Ado-Odo/Ota and 6 schols in Ifo Local Government Areas. An inventory schedule was used for data collection. 400 questionnaires, 20 questionnaires per schol were administered. The regression analysis and t-test were used to test hypothesis generated for the study of 0.05 alpha levels. The result of the findings reveal that Instructors' taeching experience has significantly influenced students' academic performance in Maths and English Language, measured by their performance in the Senior Secondary Certificate Examinations as perceived by the respondents. Schols having more Instructors with above ten years taeching experience achieved better results than those with ten years and below taeching experience. From the results, it is observed that the some of the newly employed Instructors that have not spent more than five years in the taeching service performed the same way as the Instructors that have been in the service for long. Instructors taeching experience may not determine Instructors' performance at times but Instructors' seriousness and interest they put in the taeching matters a lot.

The quality of education of a nation could be determined by the quality of her Instructors. Therefore, one of the most important factors in improving students achievement in Mathematic is by employing seasoned and qualified Instructors in all schols (Abe and Adu, 2003). Olatunde (2014) found that, policy investment on quality is related to improvements in students' performance. Specifically, the measurement of Instructors' preparation and certification are correlates of learners' achievementin Science and Maths.

Although from the literature reviewed many researchers have studied effect of experience in relation with academic achievement and realized that experience has significant difference on academic achievement but some of the researchers had contrary opinion as regards this. As a result, this study is interested in determining effect of taeching experience with regard to Maths achievement.

Age

From the findings of Emelda and Enoses (2010), it was discovered that there was a weak positive relationship between Maths Instructors' age and students' Maths academic achievement as the Pearson correlation coefficient was 0.247. The relationship was not significant because the

calculated p-value is greater than the set significant level of 0.05. The null hypothesis was therefore accepted. It implies that the relationship was not strong. When the co-efficient of determination (R^2) was run, the outcome was 0.061 which means 6.1% of the variation in the students' academic achievement was accounted for by Maths Instructors' age. The remaining 93.9% cannot be explained by the age. Rivkin, Hanushack and Kain (2005) found that Instructors taeching experience, age and educational qualifications were not significantly related to students' achievement. Babatunde (2013) found out that 80% of program beneficiaries were more than 30years of age and the study reviewed a negative correlation between Instructors age and learners achievement in Maths and English language.

In another related study, Shilpa and Usha (2018) investigated the influence of gender and age of teacher on taeching. The result revealed that there is no significant difference between the Instructors age and input put into taeching. This implies that Instructors' age have no significant effect on the Instructors' performance in the classroom. From the students comments it was realized that they did not discriminate Instructors in terms of their age, as long they are taeching effectively, enthusiastic with effective communication and problem solving.

2.2.2 Instructors' Gender, Disposition and Learning of Maths

Gender

Onakomaya (2012) examined evaluation of learners' poor performance in the senior secondary schols' Maths in Odeda local Government Area in Ogun state. 180 students were randomly selected in six secondary schols in Odeda. Data were analysed by using descriptive statistics. The result of the findings indicated that Instructors' gender cannot determine students' performance in Maths.

Kuecken and Valfort (2012) investigated the impact of student-gender interactions on learning outcomes. Data employed were derived from the second round of a survey completed in 2005 by the Southern and Eastern African Consortium for monitoring Educational Quality (SACMEQ). SACMEQ survey measures primary schol educational outcomes across all member countries in a comparable way. SACMEQ collected information about students and teacher subject knowledge via Maths and reading tests as well as a wide range of schol characteristics through students, teacher, and schol director surveys. They covered eleven countries including Botswana, Kenya, Lesotho, Malawi, Mozambique, Namibia, Tanzania, Seychelles, Swaziland,

Uganda and Zambia. Within student variation across subject was applied. The result of the findings reveals that both boys and girls perform better with a female teacher in Reading rather than with a male teacher.

In another study, Amoo, (2015) examined the effects of analogy and scaffolding instructional strategies on learning outcomes among senior secondary students and found out that there was no significant main effect of teacher gender on students'achievement and practical skills in Biology.

Odukoya (2013) investigated the effect of Instructors' gender and taeching effectiveness on students' academic performance in Maths. 100 students (60 male and 40 females) were randomly selected. Questionnaires were used to generate the data for the study. Simple percentage and Pearson product moment correlation coefficient and student t-test statistic were employed. The result of the findings revealed that there was a significant relationship or correlation between the female teacher and the perceived students' academic performance in Maths. This perception is a positive one and this implies that the female teacher influenced positively the students' academic performance in Maths (t=0.81).

In the same study, it was discovered that there was a significant relationship or correlation between the male teacher and the perceived student academic performance in Maths (t=0.61).Male and female students therefore turned to be more influenced by male and female Instructors in their academic performance in Maths. Sangodoyin (1998) found out that there is no significant relationship between male and female Maths teacher with respect to students' learning outcomes in Maths. Though the coefficient of determination (r^2) of the students taught by male Maths is more than that of the students taught by the female Maths teacher (i.e. 0.1893 > 0.0175) low and positive correlation but insignificant.

Umoh (2003) in Onakomaya (2012), defined gender as a physiological term used in describing behaviour and attributes expected of an individual on the basis of being born as either male or female. According to Okeke (2008) in Onakomaya (2012), the study of gender is not just mere identification of male and female sexes, scholars have gone further to identify responsibility assigned to opposite sexes and to analyse the condition under which those responsibilities are assigned. Gender is a cultural construct that distinguishes the roles, behaviour, mental and emotional characteristics between female and male developed by a society.

Shilpa and Usha (2018) examined influence of gender and age of Instructors on taeching. A questionnaire (feedback form) was provided to 75 second year MBBS students, after ethical consideration. A spate column was provided for their additional comments on forms regarding additional suggestions or comments. The result revealed that there is no significant difference for preference of male or female teacher but from the remarks of students it was obvious that girls felt they could interact better with lady Instructors while very few bold boys remarked that opposite sex affected them during taeching and learning in the classroom. Also, few students who preferred male Instructors' remarked that meal Instructors have better control of the class, and because of their commanding nature and strictness they (students) usually excused their classroom during taeching and learning process.

In another related study Gong, Lu and Song (2016) examined the effect of teacher gender on students academic and non-cognitive outcome. The result revealed that a female teacher raise girls' test scores and improved both their mental status and social acclimation relative to boys. Also, it has been discovered that female Instructors provide feedback differently to girls and boys, and that having a female teacher atters girls' beliefs about commonly held gender stereotypes and increases their motivation to learn.

Disposition

An disposition is an instinct feeling towards an evaluation of some objects or events. Dispositions have two important aspects. Direction (positive/negative, for or against) and Intensity (strength of feeling). Extensive research has revealed that a person's dispositions are learned, as opposed to being inherited. Many factors can influence a person's disposition, including previous experiences and social influences. Disposition as a concept is concerned with an individual's way of thinking, acting and behaving. It has very serious implications for the learner, the teacher, the immediate social group with which the individual learner relates and the entire schol system. Dispositions are formed as a result of some kind of learning experiences. They may also be learned simply by following the example or opinion of parent, teacher or friend. This is referred to as imitation and it also has a part to play in the taeching and learning situation. In this respect, the learner draws from his Instructors' disposition to form his own dispositions which may likely affect his learning outcomes. Instructors' disposition towards the taeching of Maths plays a significant role in Maths. Olojede (2013) found that students' positive

disposition towards Science could be enhanced by the following teacher related factors: Instructors' enthusiasm, Instructors' thorough knowledge of the subject-matter and their efforts at making science quite interesting. From the above, it can be said that the role of the teacher as a facilitator, and his/her contribution to learners' achievementis enormous. The importance of Instructors as links of educational programs cannot be overemphasized and their contribution to learners' achievementneeds a lot of attention. There are various ways by which the teacher can influence his students' achievement, these include among others, the following: desire to teach; quality of taeching; methodology; frequency of evaluation; mastery of the subject; interest of the subject and cordial relationship with the students.

Onokomaya (2012) studied evaluation of students' poor performance in senior secondary schol Maths in Odeda Local Government Area of Ogun state. 180 students were sampled in six randomly selected schols in the area. Data were analysed using descriptive statistics of mean and standard deviation. The result indicates that personal disposition of both teacher and student influence performance in Maths. Peter (2013) studied relationship between Instructors' disposition towards Maths and learners' achievementin Maths. The participants for the study were 4,510 senior secondary schol students and 151 Instructors were chosen using Yarrow Yamen's formula. The ex-post facto design was adopted for the study. Data were obtained through the teacher variables and learners' achievementin Maths Questionnaire was analysed by using z test statistic, mean and percentages. The result shows that there is a significant relationship between Instructors' disposition in the classroom and students' academic achievement in Maths.

Ogunwuyi (2000) opined that among six variables in her study (knowledge in spoken English; students' numerical ability; students' cognitive styles; Instructors' gender; students' gender and Instructors' disposition to integrated science), Instructors' disposition was included as significantly determining students achievement in Integrated Science directly and indirectly. Olojede (2013) examined the effect of dispositions of both Instructors and students towards Basic Science as determining factors of the students' performance. The participants were 100 students and 50 Instructors. An ex-post facto research design was employed. Three instruments were adopted. Data obtained were analysed using mean and standard deviation. The result of the study revealed that Instructors' disposition has a negative weak and insignificant relationship on learners' achievementin Basic Science. This indicates that Instructors' disposition has little to

do with learners' achievementin Basic science. Edidong and Adewale (2014) studied the disposition of the public schol Instructors towards ICT integration in Science Education. The participants for the study were 89 science Instructors that were randomly selected from 25 schols in Ibadan North Local Government Area of Oyo state. Descriptive survey research design was employed. Data were analysed using the mean and standard deviation. The result indicated that (X= 49.06, STD error 1.23) for public schol was different from that of private schol science Instructors (X= 52.75, SD error = 1.10) and the difference was found to be statistically significant. Based on the findings of the study, it was seen that Oyo state Science Instructors are having positive disposition to integration of ICT in Science Education.

Abimbade (1999) in Abimbade (2014) reported that Instructors are said to be effective when taeching can lead to students' learning. Nothing has been taught until it has been learnt and this happens when the teacher succeeds in causing a change in behaviour in the learner. It is therefore important that the teacher must consider taeching as an attempt on his own part to transfer what he has learnt to his students.

Lawal and Yelposu (2014) examined teacher disposition towards learning and taeching of Maths for sustainable development. The study reviewed that there is no significant difference in female and male Instructors' disposition both positive and negative towards the taeching of Maths except in negative disposition that Maths is very difficult. Male Instructors' disposition is significantly higher in this regard. In the same vein, Kaura (2011) examined Turkish primary schol Instructors' disposition towards ICT in education and then explored the relationship between Instructors' dispositions and factors which are related to Instructors' personal characteristics like gender, age, computer ownership at home and computer experience and found out that there was no significant difference between ICT disposition of Turkish science teacher in terms of gender.

2.2.3 Schol location and Learning of Maths

Owoeye (2000) studied the effect of the interaction of location, facilities and class size on academic performance of secondary schol students. The participants for the study were all (SS 2) student presented for the schol senior certificate examination between 1990 and 1997. They were randomly selected from fifty secondary schols consisting of twenty-one (21) rural and twenty-nine (29) urban, out of the existing one hundred and fifty one (151) secondary schols in Ekiti

state. The result obtained indicated that significant difference exists between the academic performance of rural and urban secondary schols. The researcher concluded that the geographical location of a schol influences the academic performance of students. The result of the study does not contradict the findings of Axel and Bower (1972) as cited in Yinyinola (2008) who found that students from rural areas performed significantly better than their urban counterparts in verbal aptitude, English Language and total score, using the national common entrance examination as a base.

Kemjika (1989) as cited by Owoeye (2000), in his study on rural and urban differences in creative talents among primary schol learners in Lagos state, observed that the location of the community in which the schol is situated has effect on the performance of learners. Ajayi's (1998) study lends credence to Kemjika (1989) findings when he found significant difference in the academic performance of participants in urban and rural areas of his study. The researchers concluded that the achievement must have been borne out of many facilities the urban students were exposed to which were not available in rural areas.

In a related study, Ogunlowo (1984) as cited by Lawani (2004) conducted a study on the effect of urban-rural milieu on students' achievement. She found out that the general achievement of students residing in urban areas were better than those of the rural area. Lawani (2004) studied the causal model of home and schol factors as determinants of primary schol learners achievement in English and Maths. The participants for the study were four hundred and sixty three (274 males and 189 females) primary six learners who were randomly selected from six local government areas out of the existing eleven local government areas of Ibadan through multi stage stratified sampling technique. The result of the study indicated that schol location has a significant effect on the Maths achievement of the participants. The participants in the urban schols performed better than the counterpart in their rural schols.

Yinyinola (2008) examined the effect of study skills trianing and time management strategies enhancing testwiseness and learning outcomes in Maths among secondary schol students. The research design was a 3 x 2 x 2 x 2 pre-test, post-test quazi experimental control group design. The moderating variables for the study were, gender, Maths self-efficacy and schol location. The participants for the study were one hundred and eighty (94 male and 86 female) secondary schol students. They were obtained through multi stage stratified random sampling technique. The findings revealed that there was no significant difference on the academic

performance and testwiseness of rural and urban participants in the study. The researcher concluded that location of schol does not pose a barrier to academic achievement.

In another related literature, Quadri (2012) found out that there was significant difference in the Maths performance of students in urban and rural schols. This could be an indication of the influence of learning environment on the academic performance of learners.

Joseph (2015) investigated the effects of schol location on learners' academic performance. A case of community secondary schols in Makambako town council, Njombe. Data were collected using semi-structured interview guide, questionnaires and documentary review by involving 12 Instructors, two educational officers, 200 (80boys and 120girls) students. The result revealed that longer distance travelled by students to schol made them reach schols late and with empty stomach. Location of schol has lead to mass failure to most of students, due to long walk among students have cause dropout from schol and most girls' student get pregnancy thus fails to attaint their educational goals.

2.2.4 Instructors' Taeching Effectiveness, Strategies and Learning of Maths

This is the process of acknowledging the improvement in the skills and competencies of the Instructors which invariably bounce back on their job performance. To find out if these attributes are possessed by the Instructors, there is need to evaluate Instructors taeching effectiveness. This is a periodic assessment of Instructors' performance in their job. Teacher evaluation results serve two broad purposes namely: Formative purposes – This occurs when results of evaluation are used to improve classroom instruction, student learning, and to foster professional growth of the teacher.

Summative purposes: This happens when results of evaluation are used for administrative/ personnel decisions like promotion, salary increase, demotion, dismissal, awards and/or meeting public/government accountability demands (Gold, 2001).

Asuka and Akomolafe (2000) measured taeching effectiveness in terms of learners' achievementscores. In this approach, the achievement test scores not only the students 'achievement, but also tests the Instructors' achievement, performance and effectiveness. Taeching effectiveness is a multi-dimensional construct that measures a variety of different aspects of taeching such as subject mastery, effective communication, lesson preparation and presentation and classroom management. Oredein and Oloyede (2007) found out that teacher supervision of students and quality of the taeching personnel have strong effects on students'

academic performance. In another study, Ezeasor (2000; 2003) reveal that teacher effectiveness improved the achievement of students in Biology.

Strategies

When a teacher stands in front of his/her students, the teacher's behaviour (taeching) is always more significant. Ideally, a good teacher should promote a pattern of teacher-learner interaction based in favour of encouraging the learner's active involvement in individual and group activities (e.g asking questions, discussing, manipulating, observing etc). Review of some of the few researches carried out on classroom interaction indicates that the type of interaction pattern between the teacher and the students depends on the characteristics of the teacher.

Idowu (1991) citied by Akinsola (2000) in his study, investigated the relationship between teacher's classroom pattern, students' self-concept and students' performances in Maths using modified FIACS on 20 JSS II Instructors. He concluded that the Instructors are more dominative than interactive. Akinsola (2000) examined a causal model of personal factors and threshold time for classroom interaction pattern of Maths teacher trainees in two Nigerian states. He made use of nine variables; threshold time (X_1), disposition towards Maths taeching (X_2), Disposition towards Maths (X_3), cognitive style (X_4), self -concept (X_5), nature of program (X_6), locus of control (X_7), gender (X_8), and years of taeching experience (X_9). The study revealed the order of importance of the variables to Maths classroom interaction thus: $X_3 > X_2 > X_9 > X_5 > X_4 > X_7 > X_8 > X_6$. This implies that students disposition towards Maths is the most potent factor during the classroom interactive section while the nature of the program is the least classroom interactive determinant factor. The result of the study also revealed that out of the eight variables hypothesized to be influencing the trainees' threshold time, only three had direct and indirect effects on trainees' threshold time, while the remaining five had only indirect effects.

In another related study, Amoo (2015) carried out the study on the effect of analogy and scaffolding in instructional strategies on learning outcomes in Biology among secondary schol students. The design used was 4x2x2 pre-test, post-test, non-randomized control group, quasi-experimental design. A total of seven hypotheses were tested with respect to the interactive effect of instructional method and gender on each of dependent variables. The instructional methods occurred at four levels as follows: analogy instrumental method, scaffolding instructional strategy, combination of analogy and scaffolding instructional strategies and

conventional taeching method (lecture method). Analysis of covariance was done for each of the dependent variable, the result showing significant interactive effect of gender and treatment in biology achievement. The use of instructional strategies and student gender does not have effect on the acquisition of practical skills in Biology. The interaction of treatment and teacher gender on student achievement is low; this implies that it is not significant. As a result, treatment and teacher gender does not have effect on student achievement.

Ayodele (2011) investigated the effects of interactive engagement and analogy enhanced instructional strategies on the achievement and self-efficacy of senior secondary schol chemistry students. She adopted a pretest, posttest, control group, quasi-experimental design with a 3x2x2 factorial matrix. The study involved 492 senior secondary II students from two local governments. Four instruments were used to generate the data and the data were analysed by using Analysis of Covariance and Scheffe post-hoc test. The findings revealed that the group exposed to the interactive engagement had the highest posttest achievement mean score ($\bar{x}$ =17.3) followed by those exposed to analogy enhanced instruction (17.04).

Onakomaya (2012) studied evaluation of students' poor performance in senior secondary schols Maths in Odeda Local Government Area Ogun state.180 students were randomly selected in six senior secondary schols in Odeda. Data were analysed, using descriptive statistics mean and standard deviation. The result of the findings revealed that the method of taeching applied by the Instructors help students in retaining what is being taught. The researcher discussed further that about 72.2% of the respondents reacted positively while 22.8% reacted negatively to the item in the instrument used.

Abimbade (1988) in Abimbade (2014) studied the effects of the use of Electronic calculators on outcome of Maths Instruction and revealed that there were attitudinal changes between pre - and post - dispositions among all the groups, and that the calculator groups performed better than the non-calculator groups. The results show that learners within the same ability levels who use calculators performed better than those who do not use calculators. He posited further that examining bodies in Nigeria such as West African Examination Council (WAEC) and other developing countries should encourage the use of calculators in tests. From the results of this study, calculator can easily replace the use of tables or slide rules in schols because the learner gains not only greater speed and accuracy but also the advantage of computing values that are very large.

Moreover, Abimbade (2014) realised that percentages of passes in 1979, 1980 and 1981 were 82, 96 and 100 respectively, when he was Maths teacher at Lagelu Grammar schol, Ibadan. The results show significant performance among the students. He stressed further that apart from the readiness of the students to learn, the method of taeching and resources of taeching then were love and commitment which were demonstrated by the Instructors and learners to the taeching and learning of Maths.

Peter (2013) studied the relationship between teacher's method of taeching and learners' achievementin Maths. The participants were 4,510 SS 2 students and 151 Instructors, the participants were sampled by using yarrow Yemen's formulae. Data were analysed by using, z-test statistic, means and percentages. The result indicates that there is a significant relationship between Instructors' method of taeching and learners' achievement In Maths.

This study is interested in establishing the cause and effect relationship between Instructors' interaction coupled with other variables on Maths achievement.

2.2.5 Learners' Disposition and Learning of Maths

Disposition is a central part of human identity. Everyday people love, hate, like, dislike, favour, oppose, agree, disagree, argue, persuade etc. All these are evaluative responses to an object. Hence disposition can be defined as a summary evaluation of an object of thought'' (Bohner and Wanke, 2012) in Akinyemi (2013).

Akinyemi (2013) carried out a study on students' disposition and Maths anxiety as correlates of students' academic performance in SSCE Maths. A total of 100 senior secondary schol students were sampled and students questionnaire were administered. Simple percentage, frequency count, mean and standard deviation were used. The study investigated thirteen factors that can affect student disposition towards Maths. They are, hereditary, personality factors such as readiness, anxiety, maturation, self – concept, creativity and motivation, physiological factors, instructional factors such as the material to be learned, the curriculum strategies, the taeching strategies and adequate or otherwise of learning materials, health and nutrition, study habit and examination, sex differences, environmental factors such as cultural background, socio – economic background, physical and developmental background, abstract nature of Maths and Maths symbolism, schol management reinforcement and motivations and quality of Maths

teacher. From his findings, he discovered that students' disposition has no effect on student academic performance in Maths.

2.2.6 Learners' gender and learning of Maths

From literature, gender is one of such factors that have considerable effects on students' performance especially in science subjects. Okeke (2008) refers gender as the social and cultural attributes and functions which are assigned to male and female in any society. Okeke explained further that males have the following stereotypic attributes: bold, aggressive, tactful, economical use of words while the females are fearful, timid, gentle, dull, submissive and loquacious. Umoh (2003) stated that more difficult works are usually reserved for males while females are considered feminine in a natural setting. In schols, males are more likely to take to difficult subjects areas like Science, Maths, Chemistry etc while females take to careers that will not affect their marriage chances, marriage responsibilities and motherhood negatively (Okeke, 2008).

Ezeudu (2013) examined effect of gender and location on learners' achievementin chemistry in secondary schols. The researcher adopted non-experimental design of expo-facto research type. The researcher applied simple random technique to select 827 students from eight different schols. Mean and standard deviation were used to answer research questions while t-test statistical analysis was used for hypotheses. The result of findings indicated that the male chemistry students achieved better than their female counterparts in chemistry. This showed that there was as significant difference in mean achievement scores of students in chemistry in favour of the male students.

In another related study, Adigun, Onihunwa, Irunokhai, Sada and Adesina (2015) conducted a research on the effect of gender on students' academic performance in computer studies in secondary schols. The researcher employed non-experimental design of expo-facto research type, multistage stratified sampling technique was adopted and computer studies achievement test (CSAT) was applied as the instrument while t-test was used to analyse the data. The results of the findings revealed that the male students perform better compared with the female students though the male students performance varied a little more around average compared to the female students. Hence, the present study is further poised to examine learners' gender, in a bid to determine which of them (male or female learners) performs better.

Kolawole (2012) investigated gender issues and academic performance of senior secondary schol students in Maths computation. The result revealed that students in single sex schols performed better than those students in mixed schols in computation and boys in boys' schol did not perform significantly better than girls in girls' schol. Moreover, Akaayi (2004) examined the influence of taeching method and sex difference on the performance of learners in primary schol. The result of the study showed that there was no significant difference between male and female learners' scores.

2.3 Conceptual Framework

Considering the review of related literature, the researcher establishes a scheme for this research study. This, scheme is a tentative explanation of the problem and serves as the basis for the formulation of the research questions. It contains the researcher's own view on the problem of the study after the researcher's exposure to various theories that are related to the problem of the study. This scheme serves as a guide in conducting the investigation. Hence, the framework guiding this study is graphically illustrated in figure 2.2.

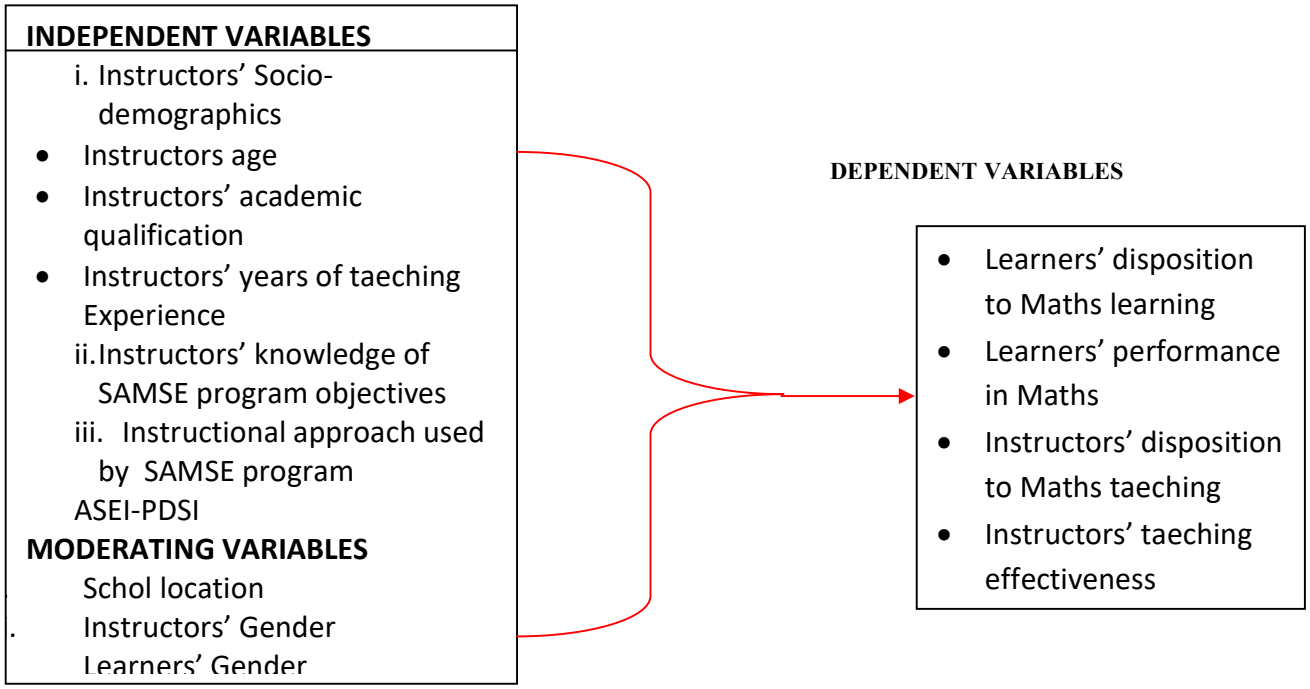

Figure 2.2: Conceptual framework of study

2.4 Appraisal of Literature Review and the Gaps to be filled

The literature reviewed emphasizes the value of Maths in all facets of life and reasons behind its taeching and learning in our schols (Nursery, primary, post primary and higher institutions of learning). Observing various review of literature on Instructors' qualification and academic achievement, it can be inferred that opinions and findings vary from one researcher to another. Some agreed that students who were taught by Instructors with degrees in Maths had greater gains in achievement than students with Instructors without Maths degree and that educational attainment of Instructors positively influenced students in Maths. However, other studies showed no significant effect of Instructors' qualification on taeching effectiveness as a measure of learners' achievementin Maths. In addition, the researcher found out that majority of Instructors were academically qualified, yet not all the Instructors are professionally qualified to handle the taeching and learning of Maths as some of them hold HND and B.Sc degrees. The difference in the result of findings call for further investigation of Instructors' qualification on taeching and learning of Maths.

Research studies also realized inconsistent results in the relationship between years of Instructors taeching experience and taeching and learning of Maths. Some studies showed a positive relationship while others showed no significant relationship. In the light of this conflicting views, the present study will investigate through further research, the effect of SAMSE program of Instructors' years of taeching experience on taeching and learning of Maths.

The researcher who had worked on schol location as determinants of learners' academic performance did not reach any tangible degree of consensus. Some claimed that schol location did not pose a barrier to academic achievement while some researchers found out that there was a significant difference in the performance of students who were taught in rural and urban environment. This prompted the researcher to revisit the variable to be sure if the variable is significant or not.

It was observed by some researchers that age has no effect on academic performance of the students. Also, some researchers found out that there was a negative correlation between Instructors' age and learners achievement in Maths and English Language. The same dimension of the past researchers on this variable prompted further investigation of the variable in this study.

It is realized in most of the past researches, that there is a significant relationship between Instructors' disposition in the classroom and students' attainment in Maths during the taeching and learning of Maths but only few researchers had a contrary result. Due to the fact that all the past research on disposition, failed to agree on a reasonable consensus on the variable, prompted the review of this variable.

From the review of literature, it was found out that most of the studies do not see any significant differences in the taeching and learning of Maths by male and female Instructors in various subjects particularly in Maths while some studies detected significant differences in the taeching and learning handled by male and female Instructors. In view of this, the researcher deems it right to re-examine the effect of gender on taeching and learning of Maths in our primary schols.

Despite all the taeching techniques applied to the taeching and learning of Maths in primary, post-primary and tertiary institutions, the performance of the learners in Maths has not yet been encouraging. Though a study had been carried out on SAMSE program in Kenyan's secondary schols which concentrated mostly on effectiveness of SAMSE approach (ASEI-PDSI), it did not look at the extent to which SAMSE program had achieved its objectives but this study looked at the extent to which SAMSE program had achieved its objectives in primary schols in Oyo state, Nigeria.

In view of this, this study evaluated SAMSE program on the taeching and learning of Maths in primary schols in Oyo State, Nigeria.

CHAPTER THREE
METHODOLOGY

Introduction

This chapter contains information on research design, evaluation model, target population, sampling techniques and sample, instrumentation, data collection, method of data analysis and methodological challenges.

3.1 Research Design

The study adopted the causal-comparative design of ex-post facto research type. This is because it does not involve manipulation of any variables, as their occurrences are deemed to have already taken place. However, it was possible to investigate the plausible cause and effect relationship.

3.2 Evaluation model

The Kirkpatrick 4-level trianing model form the evaluation framework for this study. This evaluation model was developed by Donald L Kirkpatrick in 1959 and later published in 1994. He propounded four levels of learning evaluation as: Reaction, Learning, Behaviour and Results.

Reaction: what the trainees think and feel about the trianing, that is, how trainees react to trianing. Reaction measures how trainees react to the trianing.

Learning: trainees increase in knowledge or intellectual capability during and after the trianing. This means the extent to which trainees change disposition, increase knowledge, and\ or increase skill. Learning analyzes if the trainees truly understood the trianing.

Behaviour: extent of behaviour and capability improvement and implementation/application. This implies the extent to which change in behavior occurs.

Results: interpret attainments at appropriate stages within a program, that is, it looks at the effect of the trianing resulting from the improved performance of the trainees. In a nutshell, this is the final result of the trianing. Results determine if the material had a positive impact on the business/organization.

The researcher employed Kirkpatrick model because all the four levels of the model are very relevant to this study. Take for instance, the researcher examined the reaction of the SAMSE Instructors to SAMSE program, also he looked at the learning assimilation of the SAMSE Instructors whether the SAMSE program increased the knowledge or intellectual capability of the SAMSE program Instructors or not. More so, the researcher looked at the extent of behavior and capability improvement of the SAME program Instructors that occur through the SAMSE program trianing of Instructors and lastly, the researcher considered whether this trianing program has effect on the performance of the trainees. Apart from this, Kirkpatrick model has been oftenly used for trianing program.

Table 3.1: Evaluation framework based on Kirkpatrick 4-level trianing evaluation model

Levels	Aims	Variables of interest	Instrument for data collection	Data source	Research question
Reaction	To find out how trained Instructors react to SAMSE trianing program	Trained teacher assessment of the effectiveness of SAMSE trianing program in term of resources and skills acquisition	SAMSE Instructors' knowledge and perception of the SAMSE program Questionnaire (STKPSPQ) SAMSE program Instructors Questionnaire (SPTQ)	SAMSE program Instructors Non-SAMSE program Instructors	Q2a
Learning	To find out if SAMSE Instructors have increased their knowledge and/or modified their skills and dispositions as a result of SAMSE trianing program	The changes that SAMSE program approach brought to the SAMSE program Instructors in terms of: - Knowledge acquisition - Skills acquisition and Change of disposition to Maths taeching	- Instructors' Disposition Towards Maths Taeching Questionnaire (TATMTQ) Strengthening Maths and Science Education Program Approach Observation Scale (SAMSEPAOS)	SAMSE program Instructors Non-SAMSE program Instructors	Q2b & Q5
Behaviour	To find out how well trianing has met the SAMSE program Instructors needs	Instructors disposition to the taeching of Maths.	- Instructors' Disposition Towards Maths Taeching Questionnaire (TATMQ)	SAMSE program Instructors Non-SAMSE program Instructors	Q1b
Result	To find out the extent to which trianing has improved or influenced both SAMSE program Instructors and learners	Changes in SAMSE program Instructors. Changes in learners taught by SAMSE Instructors	- Strengthening Maths And Science Education Program Approach Observation Scale (SAMSEPAOS) - Instructors' Disposition Towards Maths Taeching Questionnaire (TATMTQ) - Learners' Maths Achievement Test (PMAT) - Learners Disposition Towards Maths Learning Scale (PATMLS)	SAMSE program Instructors Non-SAMSE program Instructors SAMSE program learners Non-SAMSE program learners	Q4 Q3 a & b Q6, b, & c

3.3 Variables in the study

The independent, moderating and dependent variables are discussed below:

3.3.1 Independent Variables

i. Instructors socio-demographics: Age, academic qualification, years of taeching experience,
ii. Instructors' knowledge and perception of SAMSE Program
iii. Instructional approach used by SAMSE Program Instructors.

3.3.2 Moderating variables- (i) Schol location and (ii) Teacher gender (iii) Learners gender

3.3.3 Dependent Variables

These are the dependent variables:

i. Learners' disposition to Maths
ii. Learners achievement in Maths
iii. Instructors' disposition to Maths taeching
iv. Instructors' taeching effectiveness.

3.4 Target Population

The target population for this study comprised all primary five learners and Instructors in public primary schols in the thirty-three (33) local government areas of Oyo state. Primary 5 learners are chosen because they are not under any pressure of external examination.

3.5 Sampling Technique and Sample

The sample of the study was selected by using multistage sampling procedure. The 33 local government areas in Oyo state were already grouped into three senatorial districts - Oyo North, Oyo central and Oyo south. All the three senatorial districts were involved in the study. In Oyo North, there are thirteen (13) local government areas, Oyo central has eleven (11) while Oyo south has nine (9). Using 30% proportionate to size sampling, ten (10) local government areas out of 33 in Oyo state were selected. Four (4) were selected from Oyo North, three (3) were selected from Oyo central and three (3) were selected from Oyo south (Table 3.2).

Forty schols in the ten (10) local government areas were stratified into urban and rural. Using the list of schols that participated in the SAMSE program, one schol each was purposively

selected from urban and rural areas making twenty SAMSE schols. Also, from non-SAMSE schols, one schol each was selected from urban and rural areas by using simple random sampling technique to make twenty non-SAMSE schol. In all, a total of 40 schols were involved in the study.

One primary five Maths teacher each was purposively selected from SAMSE schols totaling 20 Instructors. Also, simple random sampling technique was used to select one primary five Maths teacher each from the non-SAMSE schol, totaling 20 Instructors. Forty (40) Maths Instructors were selected altogether. Simple random sampling technique was used to select 25 learners each from both SAMSE and non-SAMSE schols totaling 1000 learners in all the 40 schols. This was done by using balloting paper technique. 'Yes' was written on twenty –five sheets of paper and 'No', was written on five sheets of paper. Learners were asked to pick, those that picked 'yes' were selected as participants, but 997 learners were finally used three learners were unable to complete the instrument.

Table 3.2: Sampling frame of the study

S/n	Senatorial districts	Local government areas	No of schols	No of selected schols	SAMSE GROUP						NON-SAMSE GROUP					
					RURAL			URBAN			RURAL			URBAN		
					No. of schols	No of learners	No of teacher	No. of schols.	No of learners	No of teacher	No. of schols.	No of learners	No of Instructors	No. of schols.	No of learners	No of Instructors
1.	OYO NORTH	ATISBO	50	4	1	25	1	1	25	1	1	25	1	1	25	1
2.		KAJOLA	64	4	1	25	1	1	25	1	1	25	1	1	25	1
3		OGBOMOSO NORTH	27	4	1	25	1	1	25	1	1	25	1	1	25	1
4.		ISEYIN	137	4	1	25	1	1	25	1	1	25	1	1	25	1
5	OYO CENTRAL	EGBEDA	76	4	1	25	1	1	25	1	1	25	1	1	25	1
6.		LAGELU	83	4	1	25	1	1	25	1	1	25	1	1	25	1
7		AKINYELE	123	4	1	25	1	1	25	1	1	25	1	1	25	1
8	OYO SOUTH	IBADAN SOUTH EAST	73	4	1	25	1	1	25	1	1	25	1	1	25	1
9		IBARAPA NORTH	62	4	1	25	1	1	25	1	1	25	1	1	25	1
10		IBARAPA EAST	62	4	1	25	1	1	25	1	1	25	1	1	25	1
		TOTAL		40	10	250	10	10	250	10	10	250	10	10	250	10

3.6 Instrumentation

The following instruments were used to collect data for the study

(i) Learners' Maths Achievement Test (PMAT)

(ii) SAMSE Instructors' Knowledge and Perception of the SAMSE program (STKPSP)

(iii) SAMSE program Instructors Questionnaire (SPTQ)

(iv) Instructors' Disposition Towards Maths Taeching Questionnaire (TATMTQ)

(v) Learners' Disposition Towards Maths Learning Scale (PATMLS)

(vi) Strengthening Maths and Science Education program Approach Observation Scale (SAMSEPAOS)

3.6.1 Learners' Maths Achievement Test (PMAT)

This was developed by the researcher to measure knowledge attained by the learners after the SAMSE treatment have been applied. It contains 50 Maths multiple choice questions

The test was dichotomously scored manually as each correct response option attracted 1 mark while wrong option attracted zero. The table of specification for the multiple choice objective questions in Table 3.6.1 indicates that 50 percent of the questions tested knowledge, 30 percent tested comprehension and 20 percent tested application. The item difficulty indices range between 0.45 and 0.75 with discriminating indices between 0.30 and 0.45. The 50 items were selected from the pools of items trial tested. The table of specification show the final selected items for the multiple choice test. The reliab. coeff of the instrument was determined using Kuder-Richardson formula 20 (KR-20) and it was 0.77. The breakdown of the items is shown in Table 3.3

Table 3.3: Test blue print for Maths achievement Test (PMAT)

Content area		**Process area**			
		50% Knowledge	**30% Comprehension**	**20% Application**	**Total**
Numbers and numeration	40%	10(1, 5, 7, 10, 14, 19, 20, 31, 44, 47)	6(2, 3, 4, 27, 28, 37)	4(6, 12, 40, 46)	20
Geometry	20%	5(26, 28, 32, 34, 38)	3(36, 39, 45)	2(13, 48)	10
Trigonometry	4%	1(21)		1(41)	2
Statistics	14%	4(16, 17, 18, 35)	2(15, 23)	1(11)	7
Algebra process	10%	3(22, 24, 42)	1(43)	1(9)	5
Mensuration	12%	3(8, 29, 30)	2(49, 50)	1(38)	6
Total	100%	26	14	10	50

3.6.2 SAMSE Instructors Knowledge and Perception of SAMSE program Questionnaire (STKPSPQ)

The STKPSPQ was developed by the researcher and it measured the extent to which Instructors have the knowledge of SAMSE objectives and how they perceive its effectiveness. Also, it was sub-divided into three different sections. Section A consists of demographic information which include, name of schol, gender, qualifications and years of taeching experience. Section B has two (2) items and the two items are open ended and they have to do with the beneficiaries knowledge of the SAMSE objectives, while section C has ten items which focus on the SAMSE program Instructors. The content and face validity of STKPSPQ were done by researcher's supervisor and its reliab. coeff was determined, using Cronbach Alpa, which was 0.83. The response formats are: to a large extent - 3, to some extent -2 and not at all - 1.

Also, section B with open response format was scored thus: Lack Knowledge (0), Moderate (1) and Full Knowledge (2). Lack knowledge - the SAMSE program Instructors that did not know any of the two SAMSE program objectives. Moderate-those that know one out of the two objectives and the Full knowledge - the SAMSE program Instructors that know the two objectives.

3.6.3 SAMSE Program Instructors' Questionnaire (SPTQ)

This questionnaire was adapted from Babatunde (2013) and was used to retrieve information on SAMSE program Instructors' perception of the quality or adequacy of the trianing program. It contains two parts. The first part dealt with the demographic information of the SAMSE program Instructors and these include: name of schol, academic qualification, gender, age, schol location and years of taeching experience. Section B contains two parts: the first part has eighteen items that sought information on strategies for applying knowledge and skills gained from the program. A 4 point Likert Scale was used to retrieve information from the SAMSE program Instructors: Very Great Extent (VGE) – 4, Great Extent (GE)- 3, Moderate Extent (ME) – 2, Little Extent (LE) – 1, to retrieve information from the SAMSE program Instructors. The second part was on the SAMSE program Instructors' perception of the program quality/adequacy and the response formats are: Excellent – 4, Very Good – 3, Fair -2, and Poor-1. The content and face validity of SPTQ were done by the researcher's supervisor, while

the reliab. coeff was determined, using cronbach Alpha, it was 0.75. Scoring of the SPTQ was done by the number of times the SAMSE program Instructors attended the trianing: One time (1), Two times (2), Three times (3) and more than three times (4).

3.6.4 Instructors' Disposition Towards Maths Taeching Questionnaire (TATMTQ)

This questionnaire was developed by the researcher and it was used to observe the extent to which Instructors' dispositions affect Maths taeching in primary schol. Section A dealt with the demographic information of the Instructors: name of the schol, gender, years of taeching experience and academic qualification. Section B involved twenty items rated on a 4-point Likert Scale: Always True of Me (ATM) -4, True of Me (TM) – 3, Fairly True of Me (FTM) – 2, and Not True of Me (NTM) – 1. The content and face validity of this instrument was done by researcher's supervisor and the reliab. coeff was determined using Cronbach alpha,0.74.

3.6.5 Learners' Disposition Towards Maths Learning Scale (PATMLS)

This questionnaire was developed by the researcher and it measured the learners' disposition towards Maths learning. Section A dealt with learners' demographic information: Name of Schol, Class, Age and sex. Section B contains learners' attitudinal statements on Maths learning scale on a 4-point Likert: Strongly Agree – 4, Agree – 3, Disagree – 2 and Strongly Disagree – 1.

The content and face validity of PATMLS was done by correcting the mistakes made by the reseacher by researcher's supervisor and reliab. coeff was obtained using Crobanch Alpha which was 0.88. This was scored as follows: Rural (1) and Urban (2), Male (1) and Female (2)

3.6.6 Strengthening Maths and Science Education Program Approach Observation Scale (SAMSEPAOS)

The SAMSEPAOS involved two parts. The First part was adapted from SAMSE program Evaluation Checklist (2014), by adjusting and adding some contents to suit the researcher's purpose of using the instrument. Each teacher was observed once for 40 minutes. The instrument was made up of two sections. Section A deals with SAMSE Program Instructors demographic information such as Name of Teacher, Teacher qualification, Age, Rural/Urban, Date, Time, Gender, Subject taught, Topic and Sub-topic while section B contains strategic

aspect of SAMSE Approach. The Likert-type format was used: Adequatley-4, Fairly adequate -3, A little -2, Not at all-1. The Second part was adapted from Babatunde (2013) and was done by adding to the contents of the instrument. It contained eighteen items that sought information on the level of compliance of SAMSE re-trained Instructors to the prescribed SAMSE program approach: 4-point Likert response format scale was used: Very Great Extent (VGE) -4, Great Extent (GE) -3, Moderate Extent (ME) -2, and Little Extent (LE) -1. SAMSEPAOS returned a reliab. coeff 0.82 using Cronbach alpha and the content and face validity was done by researchers supervisor.

3.7 Data Collection Procedure

Researcher collected letter of permission/introduction from the Institute of Education, University of Ibadan to Oyo State Universal Basic Education Board (SUBEB) after which the office of the SUBEB chairman released another letter to the researcher to take to various primary schols that were used for the study through the local government Education Authority Secretary (LGEAS) of each local government area.

The researcher trained five research assistants for the administration of the instruments for one week. The researcher and the trained research assistants observed the Instructors during taeching in the classroom in each schol. The Instructors also responded to the other three instruments apart from taeching. That is, Instructors Disposition toward Maths Taeching Questionnaire (TATMTQ), SAMSE program Instructors Questionnaire (SPTQ) and SAMSE Teacher's Knowledge and Perception of SAMSE program (STKPS). Learners Maths Achievement Test (PMAT) were administered on the learners as well as Learners Disposition Towards Maths Learning Scale (PATMLS). The researcher and the five research assistants retrieved the instruments immediately after completion. The collection of data lasted for 8weeks.

3.8 Method of Data Analysis

The data collected were analysed using descriptive and inferential statistics as shown in

Table 3.4: Research Questions and Statistical tools

Research questions	**Statistical tools**
1a, 2a, 2b 5 and 6	Descriptive statistics
1b	Two way Anova
3 and 4	t-test
6a, 6b, and 6c	Two way Anova

3.9 Methodological Challenges

The researcher discovered that some of the participants that partook in the trianing were not science and Maths inclined. That is, some of the Instructors that took part in the SAMSE trianing neither had science nor Maths background. This was confirmed from their profile. Again, some of the lesson notes of the SAMSE Instructors were not in line with SAMSE method of writing lesson notes.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents the results and discussion of the analysed data of respondents who participated in this research. The results are presented and discussed based on the stated research questions. .

4.1 Research question 1:

(a)What are the characteristics of the SAMSE program Instructors and non-SAMSE program Instructors in terms of:

i. Qualification
ii. Years of taeching experience
iii. Gender
iv. Age

Table 4.1a: Distribution of SAMSE and non-SAMSE program Instructors by academic qualification, taeching experience, gender and age

Academic qualification	SAMSE		Non-SAMSE	
	Frequency	**Percentage**	**Frequency**	**Percentage**
NCE only	10	50.0	12	60.0
B.Ed/B.A ed/BSc(ed)/B.A+PGDE	10	50.0	8	40.0
Total	**20**	**100.0**	**20**	**100.0**
Taeching experience (yrs)				
Less than 5 years	-	-	-	-
5-10 years	1	5.0	2	10.0
11-15 years	6	30.0	9	45.0
16-20 years	6	30.0	5	25.0
21-25 years	5	25.0	3	15.0
26 years and above	2	10.0	1	5.0
Total	**20**	**100.0**	**20**	**100.0**
Gender				
Male	9	45.0	8	40.0
Female	11	55.0	12	60.0
Total	**20**	**100.0**	**20**	**100.0**
Age (years)				
25-30	-	-	1	5.0
31-35	1	5.0	1	5.0
36-40	2	10.0	4	20.0
41-45	2	10.0	5	25.0
46-50	10	50.0	6	30.0
51-55	3	15.0	2	10.0
56-59	2	10.0	1	5.0
Total	**20**	**100.0**	**20**	**100.0**

Table 4.1a shows that 50.0% (10) of SAMSE program Instructors possessed Nigeria Certificate in Education and also 50.0% (10) of them possessed B.Ed/B.A(ed)/B.Sc(ed) / BA/BSc./HND + PGDE. For non-SAMSE program Instructors 60.0% (12) of them possessed the Nigeria certificate in Education while 40.0% (8) of possessed B.Ed/BA(ed)/BSc(ed) /BA/BSc/HND + PGDE. This implies that majority of the SAMSE and non-SAMSE program Instructors possessed the Nigeria Certificate in Education.

The Table also shows the taeching experience of the selected SAMSE and non-SAMSE Instructors. None of the SAMSE Instructors had less than 5 years taeching experience and only 5.0% (1) of them had between 5 and 10 years taeching experience. Also, 65.0% (13) of SAMSE Instructors had over 15 years taeching experience. Similarly, none of the non-SAMSE Instructors had less than 5 years taeching experience, while 10.0% (2) of them had 5 to 10 years taeching experience. In addition, 45.0 % (9) of the non-SAMSE Instructors had over 15 years taeching experience. The result shows that taeching experience of the most of the SAMSE Instructors range from 11 to 15 years and 16 to 20 years while taeching experience of most of the non-SAMSE program Instructors range from 11 to 15 years.

It also indicates that 55.0% (11) of the SAMSE Instructors were females, while 45.0 % (9) were males. Similarly, 60.0 % (12) of the SAMSE Instructors were females, while 40.0% (8) of the SAMSE Instructors were male. Majority of the SAMSE and non- SAMSE Instructors were females.

Moreover, the Table reveals that 50% (10) of the SAMSE Instructors' ages fall between 46 and 50 years, 25.0% (5) of them were within the age range of 31 to 45 years and 25.0% (5) were also within the age range of 51 to 59 years. None of the SAMSE Instructors age range `fall between 25 and 30 years. Similarly, it is revealed that 30.0 % (6) of the non-SAMSE Instructors were within the age range of 36 to 45 years and 10.0 % (2) of them were within 25 to 35 years of age. This result shows that most of the SAMSE and non-SAMSE Instructors fall within the age group of 46 to 50 years.

Discussion

The findings show that all the SAMSE and non-SAMSE Instructors selected were academically and professionally qualified to teach since most of them possessed National Certificate in Education and first degree in education. Evidence from the study showed that those with either HND or first degree in other fields apart from Education had Post graduate Diploma in Education which qualified them professionally. It is believed that when Instructors have taeching experience, their learners' performance will most likely be better in the subject the Instructors teach. Again, from the result, it shows that that most of the Instructors in primary schols during the study were elderly people and had experience with necessary qualifications. This finding is in conformity with that of Babatunde (2013) who discovered that majority of the participants in NTI/MDGS Program had the academic and professional qualifications to teach at the primary schol level of education.

In addition, majority of the SAMSE Instructors have been taeching for more than fifteen years while most of the non- SAMSE Instructors had been taeching for more than ten years. Though most of the SAMSE Instructors had more years of taeching experience than most of the non-SAMSE Instructors, the Instructors in the two groups are experienced. Furthermore, the study revealed that most of the SAMSE and non-SAMSE Instructors were females. This is an indication that female Instructors were more than male Instructors in the taeching profession most especially at the primary schol level as observed in most of the primary schols visited. This finding is in line with Babatunde (2013) who find out that female Instructors are more than male Instructors in the taeching profession. It could be as a result of the fact that taeching profession is mostly preferred by the females purposely because the taeching profession gives them enough time to cater for their homes.

Research question 1:

(b)What are the attitudinal differences in taeching Maths between the SAMSE and non-SAMSE program Instructors in terms of:

i. Qualification
ii. Years of taeching experience
iii. Gender
iv. Age

Table 4.1b: Descriptive statistics of SAMSE and non-SAMSE program Instructors Attitudinal difference in Maths taeching by academic qualification, taeching experience, gender and age

Group	Academic qualification	N	Mean	Std deviation
SAMSE	NCE only	10	69.3	4.42
	B.ed/B.A(Ed)/B.Sc(ed)/B.A /BSc./HND +PGDE	10	69.0	4.74
	Total	20	69.15	4.46
Non-SAMSE	NCE only	12	58.58	12.17
	B.ed/B.A(Ed)/B.Sc(ed)/B.A /BSc./HND +PGDE	8	63.75	11.37
	Total	20	60.65	11.84
Total	NCE only	22	63.45	10.76
	B.ed/B.A(Ed)/B.Sc(ed)/B.A /BSc./HND +PGDE	18	66.67	8.51
	Total	**40**	**64.9**	**9.82**
Group	**Taeching experience**			
SAMSE	1-15	7	69.17	4.45
	16-30	13	69.14	4.64
	Total	20	69.15	4.46
Non-SAMSE	1-15	11	61.88	11.85
	16-30	9	53.67	11.06
	Total	20	60.65	11.84
Total	1-15	18	63.78	10.83
	16-30	22	66.41	8.35
	Total	**40**	**64.9**	**9.82**
Group	**Gender**			
SAMSE	Male	9	69.11	3.52
	Female	11	69.18	5.29
	Total	20	69.15	4.46
Non-SAMSE	Male	8	58.13	10.37
	Female	12	62.33	12.88
	Total	20	60.65	11.84
Total	Male	17	63.94	9.23
	Female	23	65.61	10.39
	Total	**40**	**64.9**	**9.52**
Group	**Age**			
SAMSE	25-45	5	67.4	3.36
	46-59	15	69.73	4.73
	Total	20	69.15	4.46
Non-SAMSE	25-45	11	63.25	13.23
	46-59	9	56.75	8.75
	Total	20	60.65	11.84
Total	25-45	16	64.47	11.27
	46-59	24	65.22	8.86
	Total	**40**	**64.9**	**9.82**

Table 4.1b shows that the SAMSE NCE Instructors disposition towards taeching Maths with mean score (69.3) is more favourable than non-SAMSE Instructors' disposition towards taeching Maths with mean score (58.58). Also, the SAMSE B.ed/ B.A(Ed) / B.Sc(ed) / B.A/B.Sc / HND+ PGDE Instructors with mean score 69.0 is more favourable than non-SAMSE B.ed/B.A(Ed)/B.Sc(ed)/B.A/B.Sc/HND+PGDE Instructors with mean score(63.75). Furthermore, the Table reveals that SAMSE program NCE Instructors with the mean score 69.3 and the SAMSE program Instructors who possessed B.Ed/BA (Ed)/B.Sc(ed)/ BA.BSc/HND +PGDE with the mean score 69.0 have the same disposition towards the taeching of Maths. Also, the same table indicates non-SAMSE program NCE Instructors with the mean score 58.58 and the non-SAMSE Instructors who possessed B.Ed/B.A(ed)/B.Sc(ed)/ BA/BSc/HND +PGDE with the mean score 63.75.

The Table also indicates that SAMSE Instructors disposition towards taeching of Maths whose taeching experience falls between 1 and 15 years with mean score 69.17 is more favourable than those of non-SAMSE Instructors with the same taeching experience with mean score 61.88. Also, the SAMSE Instructors disposition towards Maths taeching whose taeching experience fall between 16 and 30 years is more favourable than non-SAMSE Instructors of the same taeching experience with the mean score 53.67. Moreover, the Table reveals that SAMSE program Instructors whose taeching experience falls between 1 and 15 years have the mean score of 69.17 while SAMSE program Instructors whose taeching experience falls between 16 and 30years have the mean score of 69.14. This indicates that disposition of SAMSE program Instructors whose taeching experience falls between 1 and 15years and those that fall between 16 and 30years towards taeching Maths is more or less the same. The table, also shows the non-SAMSE program Instructors whose taeching experience falls between 1 and 15years with the mean score 61.88 and those whose taeching experience falls between 16 and 30years with the mean score 53.67.

It also reveals that disposition of SAMSE male and female Instructors toward Maths taeching with mean score 69.11 and 69.18 is more favourable than those of non-SAMSE Instructors whose mean score are 58.13 and 62.33. Also, the Table shows that SAMSE male program Instructors with the mean score 69.11 and the SAMSE female program Instructors with the mean score 69.18 have the same disposition towards the taeching of Maths. Also, the same

table reveals that non-SAMSE male program Instructors with the mean score 58.13 and non-SAMSE female program Instructors with the mean score 62.33 have slight different towards the taeching of Maths.

In addition the Table shows the disposition of SAMSE and non-SAMSE program Instructors in terms of age. Also, the Table indicates that SAMSE Instructors disposition towards Maths taeching whose age fall between 25 and45years and between 46 and 59years with the mean score 67.4 and 69.73 is more favourable than those of non-SAMSE Instructors with the mean score 63.25 and 56.75 respectively. The table reveals that 15 SAMSE Instructors fall between 46 and 59years while 5 SAMSE program Instructors fall between 25 and 45years. Similarly, 9 non-SAMSE program Instructors fall between 46 and 59years while 11 non-SAMSE program Instructors fall between 25 and 45years. This result shows that most of the SAMSE and non-SAMSE program Instructors fall within the age group 46 to 59years.

Table 4.1c: Attitudinal difference in Maths taeching between the SAMSE and non-SAMSE program Instructors by Academic Qualification

Source	Type III sum of squares	df	Means square	F	Sig.
Corrected model	851.083a	3	283.69	3.51	0.025
Intercept	166358.533	1	166358.53	2056.27	0.000
Group	624.329	1	624.3	7.72	0.009
ACAD-QUAL	58.003	1	58.00	0.72	0.403
GROUP* ACAD-QUAL	73.186	1	73.1	0.91	0.348(NS)
Error	2912.517	36	80.90		
Total	172244.000	40			
Corrected total	3763.600	39			

*Significant at P<0.05, NS =Not significant

Table 4.1c shows the disposition of both SAMSE and non-SAMSE program Instructors in Maths taeching in terms of academic qualification. The table reveals that attitudinal difference in Maths taeching between the SAMSE and non-SAMSE program Instructors in terms of academic qualification is not significant ($f_{(1,36)}$= 0.91; p>0.05). This indicates that disposition of both SAMSE and non-SAMSE program Instructors towards Maths taeching is not due to their academic qualification.

Table 4.1d: Attitudinal difference in Maths taeching between the SAMSE and non-SAMSE program Instructors by taeching experience

Source	Type III sum of squares	df	Means square	F	Sig.
Corrected model	894.621a	3	298.21	3.74	0.019
Intercept	102251.401	1	102251.40	1283.05	0.000
Group	821.958	1	107.72	1.31	0.253
Exp	107.718	1	107.72	1.35	0.253
GROUP* EXP	106.476	1	106.48	1.34	0.255(NS)
Error	2868.979	36	79.69		
Total	172244.000	40			
Corrected total	3763.600	39			

*Significant at P<0.05,NS=Not Significant

Table 4.1d reveals the disposition of SAMSE and non-SAMSE program Instructors in terms of taeching experience. The table, indicates that the attitudinal difference in Maths between SAMSE and non-SAMSE program terms in terms of taeching experience is not significant ($f_{(1,36)}$= 1.34: p>0.05). This implies that disposition of SAMSE and non-SAMSE program Instructors are not determined by the taeching experience.

Table 4.1e: Attitudinal difference in Maths taeching between the SAMSE and non-SAMSE program Instructors by Gender

Source	Type III sum of squares	df	Means square	F	Sig.
Corrected model	807.533a	3	269.18	3.28	0.032
Intercept	163157.4	1	163157.4	1986.98	0.000
Group	775.119	1	775.12	9.44	0.004
Gender	44.621	1	44.62	0.54	0.466
Gender	41.720	1	41.72	0.51	0.481(NS)
Error	2956.067	36	81.11		
Total	172244	40			
Corrected total	3763.6	39			

*Significant at P<0.05,NS=Not Significant.

Table 4.1e provides the disposition of SAMSE and non-SAMSE program Instructors in Maths taeching in terms of gender. The table reveals that attitudinal difference of SAMSE and non-SAMSE program Instructors in Maths taeching is not significant ($f_{(1,36)}^{=}$ 0.51; $p > 0.05$). This implies that gender of SAMSE and non-SAMSE program Instructors do not determine disposition of SAMSE and non-SAMSE program Instructors in Maths taeching.

Table 4.1f: Attitudinal difference in Maths taeching between the SAMSE and non-SAMSE program Instructors by Age

Source	Type III sum of squares	df	Means square	F	Sig.
Corrected model	945.717a	3	315.24	4.03	0.014
Intercept	139194.844	1	139194.84	1778.29	0.000
Group	618.002	1	618.00	7.90	0.008
Age	36.550	1	36.55	0.47	0.499
Group* Age	164.269	1	1.64.27	2.10	0.156(NS)
Error	2817.883	36	78.28		
Total	172244.000	40			
Corrected total	3763.600	39			

*Significant at P<0.05,NS=Not Significant.

Table 4.1f indicates the disposition of SAMSE and non-SAMSE program Instructors in terms of Age. The table reveals that attitudinal difference of SAMSE and non-SAMSE program Instructors in Maths taeching is not significant ($f_{(1,36)} = 2.10$;$p>0.05$). This implies that the age of SAMSE and non-SAMSE program Instructors do not influence disposition of SAMSE and non-SAMSE program Instructors in Maths taeching.

Discussion

The SAMSE Instructors' disposition towards Maths taeching is more favourable than non-SAMSE Instructors' disposition towards Maths taeching. Evidence from the study showed that majority of the sampled SAMSE Instructors claimed that they always enjoy taeching Maths and that they often give priority to improving their knowledge in Maths. Also, most of the SAMSE Instructors indicated that they attend their classes promptly and ensure that relevant instructional materials are used to facilitate the understanding of Maths by the learners and where the necessary materials were not available, they improvised so as to improve learners' learning. This finding is line with the findings of Edidiong and Adewale (2014); Olojede (2013); Onokomaya (2012); and Peter (2013) who earlier confirmed that Instructors' positive disposition towards taeching had significant effect on the students' learning.

Also, the results show that the disposition of both SAMSE and non-SAMSE NCE and B.Ed/B.A(Ed)/B.Sc(ed)/ B.A/B.Sc/HND+PGDE towards taeching of Maths were not significantly different. This is an indication that Instructors' qualification do not influence disposition of both SAMSE and non-SAMSE program Instructors but their dispositions were determined by SAMSE program intervention. This finding negates that of Goldhaber and Brewers (2000) that Instructors with degree in Maths had greater gains in achievement than Instructors without Maths degrees. It also disagrees with the findings of Onabamiro (2010) that teacher qualification and teacher trianing affect learners' performance in Science and Maths. Most of the SAMSE and non-SAMSE Instructors observed, adequately introduced their subjects by incorporating previous knowledge and linking them to the new topics. As regards development, most of the observed Instructors' lessons encouraged learners to express their prior experience, encouraged active participation of the learners and even took care of individual differences. Learners were monitored through checking the accuracy, correctness, depth and appropriateness of the content by using question and answer techniques.

This finding support that of Abimbade (2014) who claimed that apart from the readiness of students to learn, the method of taeching, resources of taeching which were love and comportment put into taeching and learning, boost the performance of the learners in Maths. This finding is also in line with that of Peter (2013) who pointed out that there was strong relationship between teacher's method of taeching and learners' achievementin Maths.

Furthermore, findings from the study indicate that SAMSE Instructors' disposition towards Maths taeching is more favourable than that of non-SAMSE Instructors based on taeching experience though attitudinal difference between SAMSE and non-SAMSE Instructors disposition towards Maths taeching is not significant based on taeching experience which implies that their attitudinal difference is due to SAMSE program intervention. This could be as a result of the exposure of SAMSE Instructors to the trianing program which served as motivating factor to them. In addition, Table 4.1d reveals that male and female SAMSE Instructors' disposition towards taeching are more favourable than that of male and female non-SAMSE Instructors, this could as a result of male and female SAMSE Instructors' involvement in the trianing program, but there was no significant attitudinal difference in both male and female SAMSE and non-SAMSE Instructors' disposition towards Maths taeching. This implies that Instructors gender has no effect on Instructors disposition towards taeching of Maths but the only difference that occur was due to SAMSE intervention program. This findings support Okonkwo (2000) who concluded that male Instructors are more capable in taeching Maths than female Instructors. Also,this result contradicts that of Kuecken (2012) who looked at impact of student-gender on learning outcomes and revealed that students perform better with a female teacher taeching them rather than with a male teacher. It is assumed that since both male and female Instructors undergo the same trianing programs, their exposure to trianing program would change their disposition towards Maths taeching.

In addition, the result of the study reveals that the disposition of both SAMSE and non-SAMSE Instructors that fall between age range of twenty-five to forty-five years and that forty-six to fifty-nine towards Maths taeching was not significantly different, this implies that Instructors age has no influence on Instructors disposition to Maths taeching but the only difference that emanate was through SAMSE intervention program. This finding negates that of Emelda and Enoses (2010) who discovered that there was a weak positive relationship between Maths Instructors' age towards Maths taeching and learners learning.

Research question2:

(a) What is the Instructors' knowledge of the SAMSE program's objectives**?**

Table 4.2a: Instructors knowledge of SAMSE objectives

	Frequency	Percentage
Lack knowledge	1	5.0
Moderate	9	45.0
Full knowledge	10	50.0
Total	20	100.0

Table 4.2a indicates that only 5.0% (1) of SAMSE Instructors lack the knowledge of SAMSE program's objectives, while 45.0% (9) of them had moderate knowledge of SAMSE programs objectives. Moreover, 50.0% (10) of the SAMSE program Instructors had the full knowledge of the SAMSE program's objectives. This implies that most of the SAMSE program Instructors had the knowledge of SAMSE program's objectives.

(b) How do the SAMSE program Instructors perceive the effectiveness of SAMSE re-trianing program in terms of resources and skills acquisition?

Table 4.2b (i): Instructors' perception of SAMSE program resources

S/n	Items	VGE (%)	GE(%)	ME(%)	LE(%)
1.	The instructional materials used during the trianing program was adequate	12(60.0)	5(25.0)	3(15.0)	0(0.0)
2.	The instructional techniques used were learner centred	14(50.0)	6(30)	0(0.0)	0(0.0)
3.	The Maths taeching skills gained during the program were adequate.	10(50.0)	8(40.0)	2(10.0)	0(0.0)
4.	Instructional materials used during the program were relevant to the subject matter taught.	15(75.0)	3(15.0)	2(10.0)	0(0.0)
5.	The taeching-learning process was interactive.	13(65.0)	6(30.0)	1(5.0)	0(0.0)
6.	The taeching skills gained could be easily put into practical use in the classroom.	9(45.0)	8(40.0)	3(15.0)	0(0.0)
7.	The program was properly organized in my centre.	6(30.0)	6(30.0)	6(30.0)	2(10.0)
8.	The trainers for Maths had mastery of what they taught.	12(60.0)	5(25.0)	2(10.0)	1(5.0)
9.	The re-trianing exercise was overloaded with too many activities.	5(25.0)	5(25.0)	8(40.0)	2(10.0)
10.	The length of the re-trianing program was inadequate.	5(25.0)	5(25.0)	8(40.0)	2(10.0)
11.	Interaction among the participants during the trianing program was inadequate	5(25.0)	3(15.0)	3(15.0)	9(45.0)
12.	The quality of the program needs to be improved upon.	13(65.0)	6(30.0)	1(5.0)	0(0.0)
13.	Trainers allowed contributions in the classroom.	14(70.0)	6(30.0)	0(0.0)	0(0.0)
14.	Participating Instructors were able to demonstrate their own area of expertise	15(75.0)	3(15.0)	0(0.0)	2(10.0)
15.	There was room for demonstration of interpersonal skills among the participants during the trianing.	12 (60.0)	7(35.0)	1(5.0)	0(0.0)
16.	The in-built practical lesson was not adequate	4(20.0)	6(30.0)	4(20.0)	6(30.0)
17.	Trainers gave room for practical lesson during trianing.	13 (65.0)	6(30.0)	0(0.0)	1(5.0)
18.	Trainers gave room for interactive communication between them and SAMSE program Instructors during trianing.	15(75.0)	5(25.0)	0(0.0)	0(0.0)

Table 4.2b(i) shows the perception of the SAMSE program about the re-trianing program in terms of resources. As shown in the Table, 75.0% of the Instructors claimed that the instructional materials used during the program were to a very great extent relevant to the subject matter taught. Participating Instructors were able to demonstrate their own area of expertise during the trianing and the trainers gave room for interactive communication between them and SAMSE program Instructors during trianing. Also, 70.0% of the SAMSE program Instructors confirmed that instructional techniques used were learner centred and trainers allowed contributions.

In addition, 65.0% of the SAMSE Instructors claimed that the taeching learning process was interactive and the quality of the program needs to be improved upon through trainers gave room for practical lesson during trianing. Also 60.0% of the SAMSE Instructors confirmed that the instructional materials used during the trianing program were adequate, the trainers for Maths had mastery of what they taught and that there was room for demonstration of interpersonal skills among the participants during the trianing.

Furthermore, 50.0% of the participants claimed that the Maths taeching skills gained during the program were adequate, 45.0% claim that the taeching skills gained could be easily put into practical use in the classrooms, while 30.0% of them confirmed that the program was properly organized in their respective study centres.

However, 25.0% of the participants claimed that the re-trianing program was to a very great extent overloaded with too many activities, that the length of the re-trianing program was inadequate and that interaction among the participants during the trianing program was inadequate, while 20.0% of the participants confirmed that the in-built practical lesson was not adequate. Based on these findings,which imply that most of the participants (SAMSE program Instructors) perceive the SAMSE program as a program that improved their skill and knowledge in Maths taeching, it is believed that SAMSE came into being at the right time. A lot of deficiencies that have been existing in the taeching and learning of Maths in most of primary schol in Oyo state, were rectified.

Table 4.2b (ii): Instructors' perception of SAMSE program skills acquisition

S/n	Item The SAMSE re-trianing program:	To a large extent	To some extent	Not at all
1.	Updated my Maths knowledge	16(80.0)	4(20.0)	0(0.0)
2.	Improved my disposition towards Maths taeching	13(65.0)	7(35.0)	0(0.0)
3.	Helped to improve my competence in Maths	13(65.0)	7(35.0)	0(0.0)
4.	Helped to build my potential in Maths	14(70.0)	6(30.0)	0(0.0)
5.	Helped me to discover innovative taeching techniques	11(55.0)	9(45.0)	0(0.0)
6.	Improved my knowledge on pedagogy	13(65.0)	7(35.0)	0(0.0)
7.	Helped me to improvise relevant local material	14(70.0)	6(30.0)	0(0.0)
8.	Changed my belief about Maths taeching	13(65.0)	6(30.0)	1(5.0)
9.	Helped make me feel at ease while taeching Maths	11(55.0)	8(40.0)	1(5.0)
10.	Helped make my classroom taeching interesting	14(70.0)	6(30.0)	0(0.0)

Table 4.2b indicates that 80.0% of the SAMSE Instructors confirmed that SAMSE program had to a large extent updated their mathematical knowledge, while 65.0% of them claimed that SAMSE re-trianing program had greatly improved their disposition towards Maths taeching, their competence in Maths and their knowledge on pedagogy. The Table further shows that 70.0% of the SAMSE program Instructors claimed that SAMSE program had to a great extent helped them to build their potential in Maths, helped them to improvise relevant local materials and also helped them to make their classroom taeching interesting.

The Table also reveals that 55.0% of the SAMSE programe Instructors indicated that SAMSE re-trianing program had to a large extent helped them to discover innovative taeching techniques and that the re-trianing SAMSE program had helped them feel at ease while taeching Maths. This result confirms that SAMSE program improved the SAMSE program Instructors' skills acquisition.

Discussion

The study revealed that most of the SAMSE program Instructors had the knowledge of SAMSE program objectives. It is assumed that all the SAMSE Instructors should have the full knowledge of the SAMSE program's objectives since it is believed that the participants could easily read the information on the program manual given to them but the reverse is the case. This finding is not in conformity with the program's planners view. It is the planners' belief that the participants can easily grasp the program's objectives since it has only two program objectives.

Though half of the SAMSE Instructors could state the program's objectives, most of the respondents claimed that instructional materials used during the program were relevant to the subject matter taught and the instructional techniques used were learner centered. They also indicated that participating Instructors were able to demonstrate their own area of expertise during the trianing and that trainers gave room for interactive communication between them and SAMSE program Instructors during trianing. Furthermore, the program's trainers allowed contributions of the participants in the classroom and that the taeching-learning process was interactive. Moreover, the trainers gave room for practical lesson during trianing and the trainers for Maths had mastery of what they taught.

Also, two-third of the respondents claimed that there was room for demonstration of interpersonal skills among the participants during the trianing. This finding shows that both the

trainees and the trainers complied with laid down principles of the SAMSE trianing program. This could be as a result of the trianing undergone by the SAMSE Instructors, because majority of the SAMSE Instructors confirmed that SAMSE program had, to a large extent, updated their mathematical knowledge and that it had improved their competence in Maths and improved their knowledge in pedagogy.

Apart from this, most of them indicated that the SAMSE program had to a great extent, helped them to build their potential in Maths and helped them to improvise relevant local materials to aid Maths taeching and made their lesson delivery, more interesting. Participants also indicated that the program had helped them to improve their disposition towards Maths taeching, to have competence in Maths taeching, improved their knowledge on pedagogy and changed their belief about Maths taeching. Furthermore, they claimed that the program assisted them to discover innovative taeching techniques and made them feel at ease while taeching Maths. This finding is in line with that of Babatunde (2013), who found out that NTI/MDGs capacity program in English language taeching in primary schols brought about more improvement in the Instructors' classroom taeching. From the class observation, it is discovered that SAMSE program Instructors exhibited the skills and knowledge acquired during the trianing which in turn reflected in their performance in disposition towards Maths taeching.

The finding of this study supports Olanloye (2018) who claimed that activity based, discussion and teamwork had significant impact on the Instructors' pedagogical competence.

Research question 3:

Is there any significant difference in

(a) Maths achievement and

(b) Maths disposition of the learners taught by SAMSE and non-SAMSE program Instructors?

Table 4.3a: Comparison of Maths Achievement of Learners taught by SAMSE and non-SAMSE program Instructors

Group	Mean	Std	df	t	p-value
SAMSE	19.34	5.89			
Non-SAMSE	18.24	6.09	995	2.90	0.004*

*Significant at P<0.05

Result of Table 4.3a shows the SAMSE group learners mean score is 19.34 and standard deviation is 5.89 while non-SAMSE group learners mean score is 18.24 and standard deviation is 6.09. The mean difference of the two groups was 1.10. The independent t-test statistics reveals that there is significant difference between the Maths achievement of learners' taught by SAMSE and non-SAMSE Instructors ($t_{(995)} = 2.90$; $p < 0.05$).

Table 4.3b: Comparison of learners' Disposition towards Maths taught by SAMSE and non-SAMSE program Instructors

Group	Mean	Std	Df	T	p-value
SAMSE	78.01	13.80			
Non-SAMSE	76.10	15.45	995	2.05	0.04*

*Significant at P<0.05

The result from Table 4.3b shows the disposition of learners taught by SAMSE and Non-SAMSE program Instructors towards Maths. The mean and standard deviation of SAMSE group are 78.01 and 13.80, while that of Non-SAMSE group are 76.1 and 15.45 respectively. The mean difference between the two groups was 1.91 and independent t-test statistic indicates that there is significant difference between the disposition of the learners of the two groups towards Maths ($t_{(995)}$ =2.05; p <0.05).

Discussion

Research question 3a assessed the difference in Maths achievement of the learners taught by SAMSE and non-SAMSE program Instructors. The result revealed that there is a significant difference in Maths achievement of learners taught by the SAMSE and non-SAMSE Instructors. The mean scores showed that learners taught by Instructors who attended SAMSE program performed significantly better than those taught by Instructors who did not attend SAMSE program. This finding is in support of Mwangi and Mugambe (2013) who discovered that there were some significant improvements in the performance of Science subjects and Maths when SAMSE program approach was adopted in Kenya schols. This could be so, because learners take learning seriously when the teacher also is ready to work.

Also, findings from the study revealed that learners taught by SAMSE Instructors had more favourable dispositions towards Maths than learners taught by non-SAMSE Instructors. The mean attitudinal scores of SAMSE and non-SAMSE learners indicated the difference in their attitudinal patterns of behaviour. It means that there is significant difference between the disposition of learners of SAMSE and non-SAMSE Instructors towards Maths learning. Evidence from the study showed that majority of the learners taught by the SAMSE Instructors claimed that Maths is one of their best subjects and that they enjoy studying Maths and pay more attention to their Instructors during Maths lesson. Apart from this, most of them indicated that it is easy to understand Maths and that if they come across any problem in Maths, they ensure that they try different methods to solve it. More importantly, most of them found methods and instructional materials applied by their Instructors very interesting which invariably boost the rate of understanding of the learners and the way and manner they react to the questions also enhance learners better performance in Maths. This finding contradicts Akinyemi (2013) who discovered that students' disposition has no effect on students' academic performance in Maths

but the finding is in line with that of Edidiong and Adewale (2014); Ogunwuyi (2000); Olojede (2013) and Onokomaya (2012) who discovered that students' positive disposition towards learning in a particular subject could be enhanced by personal disposition of the teacher of that particular subject. It has been observed that the more interest an individual has in a particular event, the more action an individual puts into such an event to achieve his/her desire. This could be related to improvement in disposition of teacher towards Maths taeching since almost all the trainees complied with the SAMSE program.

Research question 4: Is there any significant difference in the taeching effectiveness of SAMSE and non-SAMSE program Instructors?

Table 4.4 Comparison of SAMSE and Non-SAMSE Instructors' Taeching effectiveness

Group	Mean	Std	Df	t	p-value
SAMSE	73.15	12.93			
Non-SAMSE	45.9	8.843	38	7.78	0.000*

*Significant at P<0.05

Table 4.4 indicates that SAMSE program Instructors were more effective during taeching than the non-SAMSE program Instructors. Independent t-test statistic ($t_{(38)}$=7.78; $p<0.05$) shows that the difference between the two groups is statistically significant. The mean score and standard deviation of the SAMSE and non-SAMSE groups were 73.15; 12.93 and 45.9; 8.843 respectively.

Discussion

The finding of this study as shown in Table 4.4 reveals that SAMSE program Instructors taught better than non-SAMSE Instructors. This was proven by the mean score of SAMSE program Instructors that was higher than that of the non-SAMSE program Instructors. This implies that there was a significant difference in the taeching effectiveness of SAMSE program Instructors and non-SAMSE program Instructors.

This could be due to the SAMSE trianing undergone by the SAMSE program Instructors. It is note-worthy that if a teacher prepares very well for taeching without relying on residual knowledge, such a teacher will perform commendably in the classroom. This finding corroborates those of Akomolafe (2000); Azuka (2000); Okpala (2011) and Olatunde (2014) who opined that teacher factor in terms of knowledge, disposition, performance skills, competencies, class management and lesson preparation enhance Instructors' effectiveness.

Evidence from the study revealed that most of the SAMSE Instructors sampled had good mastery of the subject matter. Their classroom taeching was interesting. Majority of them adequately introduced their lessons by incorporating previous knowledge and linking them to the topics being taught. Apart from this, the introduction of most of the Instructors was stimulating enough to arouse the interest and curiosity of the learners. In the development of their lesson, majority of the sampled SAMSE Instructors' lessons encouraged learners to express their prior experience and they also encouraged active participation of learners. It is also interesting to note that most of the SAMSE trained Instructors during classroom taeching were at ease while taeching and they made use of relevant instructional materials. They adequately organised their lessons in such a way that it took cognizance of individual differences.

Furthermore, when compared with the non-SAMSE Instructors, the SAMSE Instructors adequately kept eye contact with the learners to monitor their feelings. In addition, most of them gave guidance to learners on lesson activities. They adequately conducted practicals where necessary and made appropriate adjustments as occasion demanded. As regards improvisation,

most of the SAMSE program Instructors produced and utilised improvised materials which further heightened learners' participation. This finding correlates with that of Fadeiye (2005) who submitted that aids like video tape, overhead projector and a host others may not be at Instructors' disposal but the resourceful Instructors will improvise taeching materials needed for thorough taeching and learning process. Learners achieve better when taught with concrete materials rather than without the use of concrete materials

4.5 **Research question 5**:

What is the level of compliance of SAMSE program Instructors to the prescribed SAMSE program approach?

Table 4.5: Compliance of SAMSE program Instructors to the SAMSE program

S/N	Items	VGE	GE	ME	LE
1.	Used adequate instructional materials in the classroom.	12(60.0)	5(25.0)	3(15.0)	0(0.0)
2.	Used learner centered techniques while taeching	14(50.0)	6(30)	0(0.0)	0(0.0)
3.	Divided students into groups while taeching.	10(50.0)	8(40.0)	2(10.0)	0(0.0)
4.	Used Instructional materials that were relevant to the subject matter taught.	15(75.0)	3(15.0)	2(10.0)	0(0.0)
5.	Taeching-learning process was interactive.	13(65.0)	6(30.0)	1(5.0)	0(0.0)
6.	Activity-based learning was put into practical use.	9(45.0)	8(40.0)	3(15.0)	0(0.0)
7.	Allowed learners' contributions in the classroom.	14(70.0)	6(30.0)	0(0.0)	0(0.0)
8.	Demonstration of interpersonal skills during taeching.	12(60.0)	7(35.0)	1(5.0)	0(0.0)
9.	Gave room for practical lesson during taeching.	13(65.0)	6(30.0)	0(0.0)	1(5.0)
10.	Gave room for interactive communication between them and learners during taeching.	15(75.0)	5(25.0)	0(0.0)	0(0.0)
11.	Taeching was properly organized.	6 (30.0)	6(30.0)	6(30.0)	2(10.0)
12.	Had knowledge of subject matter	12(60.0)	5(25.0)	2(10.0)	1(5.0)
13.	Taeching was overloaded with too many activities.	5(25.0)	5(25.0)	8(40.0)	2(10.0)
14.	Length of the taeching in the classroom was adequate	9(45.0)	6(30.0)	3(15.0)	2(10.0)
15.	Interaction among the learners during the taeching was adequate.	6(30.0)	7(35.0)	4(20.0)	3((15.0)
16.	Demonstrated his/her own area of expertise.	14(70.0)	3(15.0)	1(5.0)	2(10.0)
17.	In-built practical lesson was adequate.	7(35.0)	6(30.0)	5(25.0)	2(10.0)

Abbreviation

VGE – Very Great Extent

GE – Great Extent

ME – Moderate Extent

LE – Little Extent

Table 4.5 shows the level of compliance of SAMSE program Instructors to the prescribed SAMSE program approach. As shown in the Table, 85.0% of the SAMSE program Instructors to a great extent used adequate instructional materials, while 80.0% of them greatly used learner centered techniques while taeching. Also, the taeching-learning process of 95.0% of the SAMSE re-trained Instructors was greatly interactive and 85.0% of them to a large extent put activity-based learning into practical use. In addition, 90.0% of them divided the students into groups while taeching, all of them (100.0%) greatly gave room for interactive communication between them and the learners during taeching and allowed learners' contributions in the classroom. As regards demonstration of interpersonal skills during taeching, 95.0% of them greatly did so and even gave room for practical lesson during taeching. Moreover, 60.0% of the SAMSE Instructors classrooms were well organized during the course of their taeching, 85.0% of them had the knowledge of the subject matter, while 50.0% of the SAMSE Instructors taeching were overloaded with too many activities. Furthermore, 75.0% of them adhered strictly to the normal length of taeching during classroom taeching, and 65.0% of the learners taught by the SAMSE Instructors interacted very well among themselves during the taeching and learning process, 85.0% of the SAMSE Instructors demonstrated their areas of expertise, while 65.0% of them established in-built practical lesson. The result confirmed that most of the SAMSE program Instructors complied with the SAMSE program approach.

Discussion

Result of this study shows that the level at which majority of the participants complied with the SAMSE program approach was high. Evidence from the study revealed that most of the SAMSE program Instructors used relevant instructional materials and the instructional techniques used were learner centered. Also, most of the SAMSE program Instructors were able to demonstrate their own area of expertise during classroom taeching and they gave room for interactive communication between them and the learners.

Furthermore, most of the SAMSE program Instructors allowed contributions of the learners in the classroom and their taeching-learning process was interactive. They also gave room for practical lesson during taeching and had good mastery of what they taught. Most of the SAMSE Instructors divided learners into groups while taeching in order to comply with the SAMSE program approach. The taeching processes of most of the SAMSE Instructors were well- organized and they put activity based learning into practical use. Also, the SAMSE

Instructors adhered strictly to the precise length of taeching during the classroom taeching. The compliance of the SAMSE Instructors with SAMSE trianing program eventually boost the level of attainment of SAMSE Instructors and their disposition towards Maths taeching. This, in turn improved the performance of the learners in Maths.

4.6 Research question 6:

(a_1) Did teacher gender significantly moderate the effects of SAMSE program on learners' Maths achievement?

(a_2) Did teacher gender significantly moderate the effects of SAMSE program on learners' disposition to Maths?

Table 4.6a: Descriptive Statistics of SAMSE and non-SAMSE Schols Learners' performance in and disposition towards Maths by Instructors' Gender

Instructors' gender	Group	N	Mean	Std deviation
MALE	SAMSE	249	19.62	6.39
	Non-SAMSE	198	18.01	5.74
	TOTAL	447	18.9	6.16
FEMALE	SAMSE	250	19.06	5.34
	Non-SAMSE	300	18.39	6.31
	Total	550	18.69	5.89
Total	SAMSE	499	19.34	5.89
	Non-SAMSE	498	18.24	6.09
	Total	997	18.79	6.02

Group	Instructors' gender			
SAMSE	Male	249	79.62	14.27
	Female	250	76.4	13.15
	Total	499	78.01	13.80
Non-SAMSE	Male	198	77.13	13.91
	Female	300	75.42	16.37
	Total	498	76.1	15.45
Total	Male	447	78.52	14.15
	Female	550	75.87	14.99
	Total	997	77.05	14.67

Table 4.6a reveals that male SAMSE Instructors' learners' mean score in Maths is 19.62 while that of the learners taught by female SAMSE Instructors was 19.06. This indicates that learners taught by male SAMSE Instructors performed better than learners taught by female SAMSE Instructors. However, learners taught by female non-SAMSE Instructors performed better than learners taught by male non-SAMSE Instructors .With regard to achievement in Maths, mean score of female non-SAMSE Instructors was 18.39 while the male mean score of non-SAMSE Instructors was 18.01. The mean difference between the two groups is 0.38.This implies that there is a difference in the pattern of Maths achievement of both SAMSE and non-SAMSE groups.

The same Table 4.6a reveals that disposition of Learners taught by male SAMSE Instructors towards Maths (79.62) is more favourable than those that were taught by female SAMSE Instructors. (76.4). Also, the Table shows that disposition of Learners taught by male non-SAMSE Instructors towards Maths (77.13) is more favourable than those that were taught by female non-SAMSE Instructors (75.42).

Table 4.6b: SAMSE and non-SAMSE Learners' performance in Maths as moderated by Teacher's Gender

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	359.125a	3	119.71	3.33	0.019
Intercept	343662.7	1	343662.70	9564.59	0.000
Instructors' gender	1.836	1	1.84	0.05	0.821
Group	317.93	1	317.93	8.85	0.003
Teacher gender *group	54.272	1	54.27	1.51	0.219(NS)
Error	35679.22	995	35.93		
Total	387982	997			
Corrected total	36038.35	996			

*Significant at P<0.05, NS=Not Significant

Table 4.6b shows the SAMSE and Non-SAMSE learners' performance in Maths as moderated by Instructors' gender. The Table shows the moderating effect of teacher's gender on SAMSE and non-SAMSE learners' performance in Maths is not significant ($f_{(1,995)}$=1.51; P>0.05). This implies that the effect of SAMSE and non-SAMSE learners' performance in Maths is not moderated by the teacher's gender

Table 4.6c: SAMSE and non-SAMSE Learners' Disposition towards Maths as moderated by Instructors' Gender

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	2546.654a	3	848.89	3.98	0.008
Intercept	5805846	1	5805846	27213.05	0.000
Group	733.005	1	733.01	3.44	0.064
Instructors' gender	1481.887	1	1481.89	6.95	0.009
Group*teacher gender	138.509	1	138.51	0.65	0.421(NS)
Error	211854.4	995	213.35		
Total	6133933	997			
Corrected total	214401.1	996			

Significant at P<0.05, NS = Not Significant

Table 4.6c indicates the SAMSE and Non-SAMSE learners' disposition towards Maths as moderated by Instructors' gender. The Table shows that the moderating effect of Instructors' gender on SAMSE and non-SAMSE learners' disposition towards Maths is not significant ($f_{(1,995)} = 0.65$; $P>0.05$). This implies that the effect of SAMSE and non-SAMSE learners 'disposition towards Maths is not dictated by the Instructors' gender.

(b1) Did schol location significantly moderate the effects of SAMSE program on learners' Maths achievement?

(b_2) Did schol location significantly moderate the effect of SAMSE program on learners' disposition to Maths?

Table 4.6d: Descriptive Statistics of SAMSE and non-SAMSE Schols Learners' performance in and disposition towards Maths by Schol location

Group	Schol location	N	Mean	Std deviation
SAMSE	Rural	257	18.49	5.72
	Urban	246	20.36	5.65
	Total	503	19.42	5.76
Non-SAMSE	Rural	250	16.11	5.66
	Urban	344	20.31	5.55
	Total	494	18.18	5.98
Total	Rural	507	17.3	5.81
	Urban	490	20.33	5.59
	Total	997	18.8	5.89
	Rural	257	75.07	14.21
SAMSE	Urban	246	81.84	10.33
	Total	503	78.43	12.88
	Rural	250	74.67	14.09
Non-SAMSE	Urban	244	77.85	10.33
	Total	494	76.24	14.76
	Rural	507	74.87	14.14
Total	Urban	490	79.85	13.17
	Total	997	77.33	13.89

Table 4.6d indicates that SAMSE learners taught in urban areas with the mean score 20.36 is more favourable than SAMSE learners taught in rural areas with the mean score 18.49. This implies that schol location moderates both non-SAMSE and SAMSE learners' performance in Maths. Furthermore, the same Table shows that non-SAMSE learners taught in urban areas performed more favourable with the mean score 20.31 than those non-SAMSE learners taught in rural areas with mean score 16.11.

The same Table 4.6d shows that the SAMSE learners' disposition towards Maths in urban areas is better than SAMSE learners' disposition towards Maths in rural areas with mean score of 81.84 and 75.07 respectively. However, the Table also indicates the mean score of non-SAMSE learners' disposition towards Maths in rural areas (74.67) and the mean score of Non-SAMSE learners' disposition towards Maths in urban areas (77.85). This implies that non-SAMSE learners' disposition towards Maths in urban areas is better than the non-SAMSE learners' disposition towards Maths rural areas. This implies that schol location moderates both non-SAMSE and SAMSE learners' disposition towards Maths.

Table 4.6e: SAMSE and non-SAMSE Learners performance in Maths as moderated by Schol location

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	2929.3620	3	976.45	30.65	0.000
Intercept	343376.8	1	343376.80	10778.28	0.000
Group	358.959	1	358.96	11.27	0.001
Schol location	2226.627	1	2226.63	69.89	0.000
Group*schol location	329.267	1	329.27	10.34	0.001*
Error	30775.03	995	31.86		
Total	3764.66	997			
Corrected total	33704.4	996			

*Significant at P<0.05

Table 4.6e reveals the SAMSE and Non-SAMSE learners' performance in Maths as moderated by schol location. The Table shows that moderating effect of schol location on SAMSE and non-SAMSE learners' performance in Maths is significant ($f_{(1,995)} = 10.34$; $P<0.05$). This indicates that the effect of SAMSE and non-SAMSE learners' performance in Maths is moderated by the schol location of the SAMSE and non-SAMSE program learners.

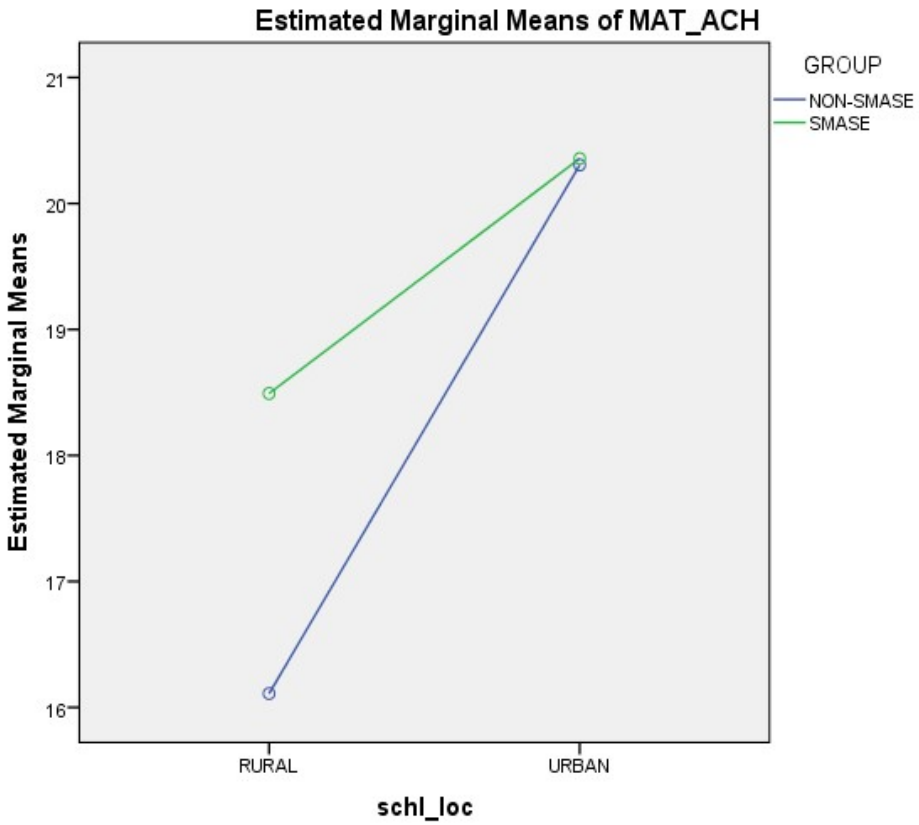

Fig 4.6a: Estimated marginal means of learners' Maths performance based on schol location

Fig 4.6a indicates that the two lines on the graph intersect. This shows that SAMSE and Non-SAMSE learners' performance in Maths is based on schol location. This implies that there is interaction effect in SAMSE and Non-SAMSE learners' performance in Maths based on schol location and the effect is significant.

Table 4.6f: SAMSE and non-SAMSE Learners' Disposition towards Maths as moderated by Schol location

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	7947.672a	3	2649.22	14.30	0.000
Intercept	5803708	1	5803708	31334.20	0.000
Group	1169.253	1	1169.25	6.31	0.012
Schol location	5992.796	1	5992.79	32.36	0.000
Group*schol location	783.006	1	783.01	4.23	0.040*
Error	178922.1	995	185.22		
Total	5988004	997			
Corrected model	186869.8	996			

*Significant at P<0.05

Table 4.6f provides SAMSE and Non-SAMSE learners' disposition towards Maths as moderated by schol location. The Table shows that the moderating effect of schol location on SAMSE and non-SAMSE learners disposition towards Maths is significant ($f_{(1,995)} = 4.23$; $p<0.05$). This implies that effect of SAMSE and non-SAMSE program learners is moderated by the location of the SAMSE and non-SAMSE learners' schols.

C_1: Did learners' gender significantly moderate the effects of SAMSE program on learners' Maths achievement?

C_2: Did learners' gender significantly moderate the effects of SAMSE learners' disposition towards Maths as moderated by learners' gender?

Table 4.6g: Descriptive statistics of SAMSE and non-SAMSE Learners' Maths achievement and disposition by learners' gender

Group	Gender	N	Mean	Std deviation
SAMSE	Male	249	19.62	6.39
	Female	250	19.06	5.34
	Total	499	19.34	5.89
Non-SAMSE	Male	198	18.01	5.74
	Female	300	18.39	6.31
	Total	498	18.24	6.07
Total	Male	447	18.9	6.16
	Female	550	18.69	5.89
	Total	**997**	**18.79**	**6.02**
SAMSE	Male	249	79.64	11.32
	Female	250	79.79	10.53
	Total	499	79.73	10.86
Non-SAMSE	Male	198	76.68	15.45
	Female	300	76.63	13.81
	Total	498	76.65	14.61
Total	Male	447	77.97	13.87
	Female	550	78.18	12.40
	Total	**997**	**78.08**	**13.08**

Table 4.6g reveals the SAMSE and non-SAMSE learners gender towards learners Maths achievement. The table indicates that SAMSE male and female learners with mean score 19.62 and 19.06 performed better than non-SAMSE male and female learners with mean score 18.01 and 18.31. Also, SAMSE male and female learners towards learning of Maths are similar since their mean scores are 19.62 and 19.06. Also, the table reveals that non-SAMSE male and female learners towards Maths achievement are alike since their mean scores are 18.01 and 18.39.

The Table also reveals that the SAMSE and non-SAMSE learners' disposition towards Maths is moderated by learners' gender. Also, the Table indicates that disposition of SAMSE male and female learners with mean score 79.64 and 79.79 is more favourable than non-SAMSE male and female learners with the mean score 76.68 and 76.63. However, SAMSE male and female learners disposition toward Maths learning are similar since their mean scores are 79.64 and 79.79. Also, the table shows that the dispositions of non-SAMSE male and female learners are similar since their mean scores are 76.68 and 76.63.

Table 4.6h: SAMSE and non-SAMSE learners' performance in Maths as moderated by learners' Gender

Source	Type III sum of squares	df	Means square	F	Sig.
Corrected model	779.488a	3	259.83	7.195	0.012
Intercept	298763.160	1	298763.16	8273.64	0.000
Group	768.042	1	768.04	21.27	0.021
Sex	0.018	1	0.02	0.00	0.341
GROUP* SEX	28.759	1	28.75	0.80	0.512(NS)
Error	29899.282	995	36.11		
Total	332248.000	997			
Corrected total	30678.769	996			

*Significant at P < 0.05,NS=Not Significant.

Table 4.6h shows SAMSE and non-SAMSE learners' performance in Maths as moderated by learners' gender. The table reveals that the moderating effect of learners' gender on SAMSE and non-SAMSE learners' performance in Maths is not significant ($f_{(1,995)}= 0.80$; $p > 0.05$). This implies that learners performance in Maths is not determined by the Learners' gender.

Table 4.6i: SAMSE and non-SAMSE learners' Disposition towards Maths as moderated by Learners' Gender

Source	Type III sum of squares	df	Means square	F	Sig.
Corrected model	1956.152a	3	652.05	3.85	0.009
Intercept	4998490.94	1	4998490.94	29509.57	0.000
Group	1913.880	1	1913.88	11.30	0.001
Sex	0.628	1	0.63	0.004	0.951
GROUP* SEX	2.085	1	2.09	0.012	0.912(NS)
Error	140251.126	995	169.39		
Total	5214865.000	997			
Corrected total	142207.218	996			

*Significant at P < 0.05,NS=Not Significant.

Table 4.6i provides SAMSE and non-SAMSE learners as moderated by learners' gender. The table shows that the moderating effect of learners' gender on SAMSE and non-SAMSE learners disposition towards Maths is not significant ($_{f(1,995)}$ = 0.012; p>0.05). This implies that SAMSE and non-SAMSE learners' disposition towards Maths is not determined by the learners' gender.

Discussion

The study discovers that Instructors' gender has no effect on learners' performance in Maths achievement. It could be as a result of the similar trianing received by both male and female Instructors in the various Instructors' colleges they attended. This finding corroborates Sangodoyin (1998) and Onakomaya (2012) who found out that Instructors' gender did not determine learners' performance in Maths. On the issue of learners' disposition towards Maths, Instructors' gender has no significant effect on it. This might be as a result of individual differences because every rational being has his or her taste and what they admire differs. This finding contradicts the views of Onakomaya (2012); Olojede (2013) and Peter (2013), who confirmed that personal disposition of both teacher and student influence students' performance in Maths. Moreover, location of schol has a significant effect on learners' performance in Maths learning. This could be as a result of the conducive environment in which both Instructors and learners interact. The result of this finding corroborates that of Owoeye (2000) and Yinyinola (2008) who indicated that significant difference exists between the academic performance of rural and urban secondary schol students.

Furthermore, this study reveals that schol location has effect on learners' disposition towards Maths learning. The disposition of the learners from urban areas is far better than those learners from the rural environment.

In addition, figure 4.6a reveals that there is interaction effect of schol location on SAMSE and non-SAMSE learners' performance in Maths, and that the interaction is significant. Also, there is interaction effect of schol location on both SAMSE and non-SAMSE learners' disposition towards Maths. No doubt, it has been discovered that in the urban environment, there are lots of social amenities that encourage people to stay and live in such environment, unlike life in the rural environment limited which is characterized by limited modern infrastructure. This could also affect learners' performance in Maths and disposition towards Maths. Learners

perform better and relate well when they are exposed to a lot of social amenities that aid learning.

However, the findings, revealed that the gender of Instructors did not have any impact on the Learners performance in Maths and learners dispositions towards the subject but the schol location has impact on both the Learners performance in Maths and learners disposition towards the subject (Maths). This implies that being a female or male teacher has nothing to do with the performance of learners in Maths and dispositions towards Maths but the exposure of the learners determines Learners performance in Maths and their disposition towards the subject. The result of the finding also reveals that Learners' gender has no effect on Learners performance in Maths and their disposition towards Maths learning because the performance in Maths and disposition of the Learners towards the subject is not due to Learners gender but influenced by SAMSE program.

This finding negates that of Ezeudu (2013) who discovered that the or male chemistry students achieved better result than their female counterparts in Chemistry. Also, this finding does not support the findings of Adigun, Onihunwa, Irunokhai, Sada and Adesina (2015) because they found out that the male students perform better compared with the female students in Computer studies, which implied that there was significant difference in the performance of male and female students in both Chemistry and Computer studies.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter presents the summary of findings of the study, conclusion and recommendations.

5.1 Summary

The study evaluated the SAMSE program and its influence on SAMSE program Instructors and primary schol learners' performance in Maths in Oyo State, Nigeria. The reason for the study is to determine whether the SAMSE program has improved the Instructors' taeching pedagogy and learners' performance in Maths. The study adopted causal-comparative design of ex-post facto descriptive research type. Multi-stage sampling technique was adopted to select the samples. Six Instruments were used to collect data; namely:

(i) Learners' Maths Achievement Test (PMAT);
(ii) SAMSE Instructors' Knowledge and Perception of the SAMSE program (STKPSP);
(iii) SAMSE program Instructors Questionnaire (SPTQ);
(iv) Instructors' Disposition Towards Maths Taeching Questionnaire (TATMTQ);
(v) Learners' Disposition Towards Maths Learning Scale (PATMLS);
(vi) Strengthening Maths and Science Education program Approach Observation Scale (SAMSEPAOS).

The major findings of this study are summarized as follows:

- Disposition of SAMSE program Instructors irrespective of years of taeching experience was more favourable than the disposition exhibited by non-SAMSE Instructors towards Maths taeching.
- Fifty-five percent of the SAMSE and non-SAMSE program Instructors possessed Nigeria Certificate in Education.

- Most of the SAMSE program Instructors have the knowledge of the SAMSE program's objectives.
- More than fifty percent of the SAMSE program Instructors complied with the SAMSE program approach.
- Majority of the SAMSE program Instructors claimed that SAMSE program updated their mathematical knowledge, helped to build their potentials in Maths, helped them to improvise relevant local materials to teach Maths and helped to make their classroom taeching very interesting.
- Learners of SAMSE program Instructors performed significantly, better than those of the non-SAMSE Instructors in Maths achievement.
- Disposition of the learners taught by SAMSE program Instructors was statistically significantly more favourable than those learners taught by non-SAMSE Instructors.
- SAMSE program Instructors taught more effectively than non-SAMSE program Instructors.
- Majority of the participants confirmed that the instructional techniques used during the trianing program were learner-centered. In addition, instructional materials were relevant to the subject matter taught and the taeching learning process was interactive.
- SAMSE and non-SAMSE schols learners' performance in Maths was influenced by schol location since both SAMSE and non-SAMSE urban learners performed better than SAMSE and non-SAMSE rural learners. Moreover, there is interaction effect of schol location on learners' Maths performance and the difference in means is statistically significant.
- Both SAMSE and non-SAMSE learners' disposition towards Maths in the urban areas is more favourable than those in the rural areas. Though there is no interaction effect, the mean differences in SAMSE and non-SAMSE learners' dispositions towards Maths in both rural and urban areas are statistically significant.
- Both SAMSE and non-SAMSE learners' disposition towards Maths in the urban areas is more favourable than those in the rural areas.

5.2 Educational implications of the study

The first implication of the findings of this study is that SAMSE and non-SAMSE Instructors who are NCE holders are mostly recognised in terms of their taeching effectiveness. This could be because NCE students faced more rigor than their counterparts (Degree graduands) during their scholing period

Another implication of the findings is that in-service SAMSE re-trianing program changed the behavioural pattern of both learners and Maths Instructors who partook in it. This suggests that there should be continuation of the in-service trianing program for improving on-the-job performance.

Also, the implication of the findings is that the learners taught with aid of instructional materials performed better than those that were not taught with instructional materials. Furthermore, the implication of the findings furnish schol administrators, planners and policy makers with data on the extent to which the SAMSE program impacts positively on Maths taeching and learning. Also, the findings will also inform policymakers of the gains, progress, strengths and weakness of Strengthening Maths and Science Education Program on Maths taeching and learning.

5.3 Conclusions

This study evaluated the SAMSE re- trianing program. Based on the data and findings from this study, it can be concluded that both SAMSE and non-SAMSE NCE Instructors performed better than other set of Instructors in the SAMSE re-trianing program. Secondly, both SAMSE and non-SAMSE Instructors working in the urban areas performed better than those in the rural areas. Also, they had more favourable disposition towards Maths taeching. When compared with the learners of non-SAMSE Instructors, the performance in Maths and disposition of SAMSE Instructors' learners towards Maths learning, was better.

5.4 Recommendations of the study

There should be continuity in trianing and re-trianing programs for Maths Instructors in primary schols so as to provide a basis for their own personal improvement in mathematical knowledge and eventually lead to improvement in the performance of their learners.

Instructors' knowledge should always be updated in the area of taeching methods and strategies. Taeching materials should be provided to all Primary schols in Oyo State to aid taeching and learning of Maths. Incentives should be given to Maths Instructors to boost their effectiveness. Schol administrators should ensure they enforce sanctions on the Maths beneficiary teacher(s) that failed to introduce Schol Based Trianing (SBT) in their respective schols.

5.5 Limitations of the study

This study was limited to primary five learners in ten local government areas in three senatorial districts in Oyo state. There is the need for a wider coverage in other educational zones in other states in Nigeria. The study was also limited to evaluation of SAMSE program on Maths taeching and learning.

5.6 Contributions of the study to knowledge

- SAMSE program developed in Instructors the skills that could be used to bring about improvement in the taeching and learning of Maths in primary schols. This evidence is revealed from the performance of SAMSE Program Instructors towards taeching of the subject.
- Also, it developed in the Instructors positive dispositions towards the taeching of Maths.
- SAMSE program improved students' performance in the learning of Maths. This is due to the skills acquired and knowledge gained by the SAMSE program Instructors during the re-trianing program which are applied in taeching process.
- More so, SAMSE program developed in students positive dispositions towards learning of Maths.

5.7 Suggestions for further studies

- Further researches could be done on simultaneous evaluation of Maths and science education since the two disciplines were primarily the target of the SAMSE re-trianing program. More so, science education subject could be evaluated separately as done to Maths. Also, the method used in strengthening Maths and Science Education Program should be extended to secondary schol Instructors' trianing program

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APENDIX I

Federal Ministry of Education primary 4 Monitoring Learning Achievement

Numeracy percentage mean scores 1996-2011

Indicators	**Numeracy**		
	1996 MLA	**2003 MLA**	**2011 MLA**
National means score (%)	32.20	43.81	36.28
Mean score Girls (%)	31.89	33.74	37.00
Mean score Boys (%)	32.42	33.52	36.98
Mean score urban (%)	35.00	34.33	38.29
Mean score rural (%)	30.33	35.21	36.28
Mean score public (%)	30.13	30.63	39.78
Mean score private (%)	43.08	43.12	36.25
Mean score attended nursery (%)	NA	36.88	33.19
Mean score not attended nursery (%)	NA	33.31	32.29

Source: First and second Primary Education improvement Projects

Universal Basic Education Program National Assessment 1996-2011

APENDIX II

Federal Ministry of Education primary 6 Monitoring Learning of Achievement Numeracy percentage mean scores 2003-2011

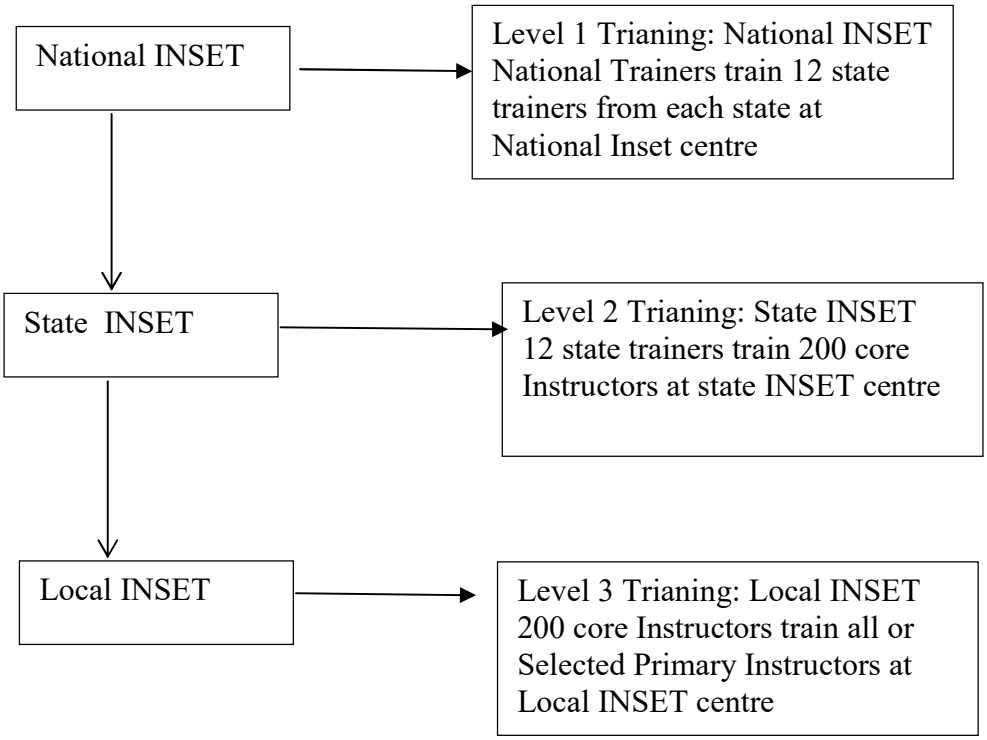
Indicators	**Numeracy**	
	2003 MLA	2011 MLA
National mean score %	35.73	31.19
Mean score girls %	35.25	NA
Mean score boys %	35.56	NA
MEAN SCORE URBAN %	37.19	34.53
Mean score rural %	33.51	32.90
Mean score public %	35.09	35.79
Mean score private %	40.35	32.84
Mean score attended nursery %	40.05	33.19
Mean score not attended nursery (%)	34.91	32.29

Source: First and second Primary Education Improvement Projects

Universal Basic Education Program National Assessment 2003-2011

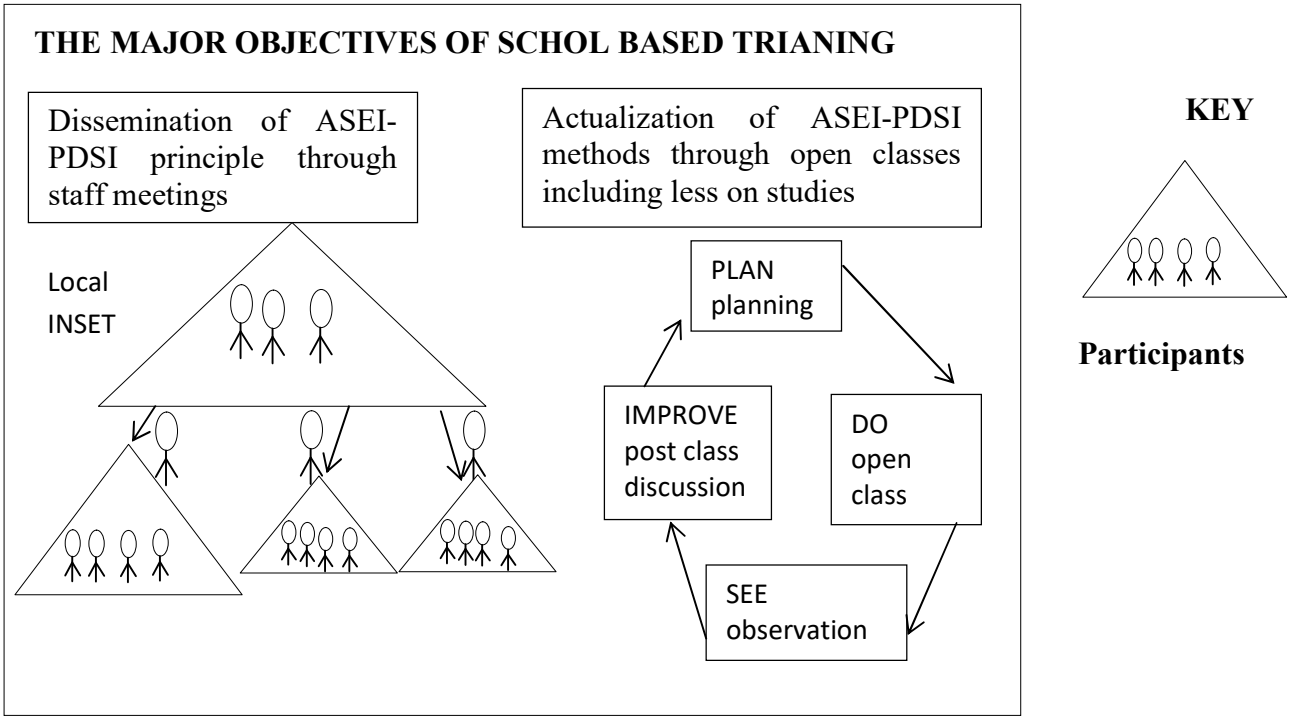
APENDIX III

The cascade trianings as represented graphically



SOURCE: *FME SAMSE Nigeria INSET GUIDELINES January, 2014*

APENDIX IV



SBT system and objectives

SOURCE: *FME SAMSE Nigeria INSET GUIDELINES January, 2014*

APENDIX V
INTERNATIONAL CENTRE FOR EDUCATIONAL EVALUATION
INSTITUTE OF EDUCATION
UNIVERSITY OF IBADAN

IBADAN

LEARNERS' MATHS ACHIEVEMENT TEST (PMAT)

Instruction: Attempt all questions.

Work as rapidly and as accurately as you can. Do not spend a long time on any problem

1. What is the value of 7 in the number 748?
   A. 7 B. 70 C. 700 D. 7000.

2. Arrange in ascending order of magnitude 2/3, ¾, 5/6, and 4/5.
   A. 5/6, 4/5, ¾, 2/3 B. 2/3, 4/5, ¾, 5/6 C. 2/3, ¾, 4/5, 5/6 D. 5/6, 2/3, 4/5, ¾.

3. What is the value of 2^3 x 3^2 x 7?
   A. 504 B. 378 C. 252 D.72.

4. Express 20110 in words.
   A Twenty thousand and eleven ten B. Twenty thousand, one hundred and ten
   C. Two thousand, one hundred and ten D. Twenty thousand, ten hundred and ten

5. Approximate 30.74 to three significant figures.
   A. 310 B. 307 C. 31.0 D 30.7.

6. What is the sum of the values of 2 and 1 in the number 4 219?
   A. 21 B. 201 C. 210 D. 2001.

7. Find the H.C.F. of 12, 18 and 36.
   A. 3 B. 6 C. 9 D. 12.

8. How many faces has a cube?
   A. 24 B. 12 C. 8 D. 6

9. If a * b = a + b+ab. What is the value of 8 * 5.
   A. 13 B. 18 C. 40 D. 53.

10. Express 45/72 in the simplest form.
    A. 1:3 B. 5:8 C. 8:5 D. 72:17.

11. A schol has 600 learners, 44% of the learners are boys. How many girls are in the schol?
    A. 364 B. 352 C. 349 D. 336.

12. Add up four dozen, four scores and one gross.
    A. 192 B. 224 C. 236 D. 272.

13. A boy goes round the edges of a rectangular field four times, if the field is 25m by 20m, find the total distance?

A. 180m B. 280m C.320m D. 360m.

14. An article which costs N30 was sold for N27. Find the percentage loss.
A. 5% B. 10% C. 20% D. 25%.

15. A motor-cycle travels at an average speed of 50km per hour, how far does its go in 6 ½ hours?
A. 325km B. 335km C. 345km D. 355km.

16. The scores of ten learners in a class are 6, 7, 6, 7, 2, 0, 7, 2, 6, 7. Find the mode?
A. 0 B. 2 C. 5 D. 7.

17. The average attendance of class at schol for 5days was 46. The attendance on 4 of those days were 46, 47, 43, 45. What was the attendance on the fifth day?
A. 47 B. 49 C. 48 D. 50.

18. What is the median of the number 2, 4, 1, 7, and 5?
A. 7 B. 5 C. 4. D. 2.

19. Express the Roman numerals CDLX in Hindu Arabic Numbers.
A. 350 B. 440 C. 460 D. 560.

20. Which of the following numbers 2, 5, 7, 13, 27 is not a prime number?
A. 2 B. 5 C. 7 D. 27.

21. If the course of a ship is 225^0, in which direction is it sailing?
A. South-East B. South-west C. East D. West.

22. When a certain number is divided by 25, the result is 32 with a remainder of 15. What is the number?
A. 815 B. 827 C. 847 D. 851.

23. The average of 4, 6, 3 x and 9 is 6. Find the value of x.
A. 7 B. 8 C. 9 D. 10.

24. If 2 (3 + q) = 18; Find the value of q.
A. 2 B. 4 C. 6 D. 8.

25. Find the area of a semi-circle of radius 7cm (use $\bar{x} = \frac{22}{7}$).
A. $145cm^2$ B. $147cm^2$ C. $77cm^2$ D. $11cm^2$.

26. Find the third angle of a triangle when the other angles are 48^0 and 35^0.
A. 79^0 B. 87^0 C. 97^0 D. 107^0.

27. If N1.00 = 4.25 cedis, what is the value of N100 in cedis?
A. 0.0425 cedi B. 4.25 cedis C. 42.5cedi D. 425cedis.

28. Olu, Ade and Ayo shared N30 in the ratio 1:2:3. How much does Ayo take?
A. N5 B. N10 C. N15 D. N18.

29. A lorry tank was 3/5 full of petrol, 21 litres was then added and it is now 5/6 full. How many litres of petrol can the tank hold?

A. 90litres B. 80litres C. 70litres D. 60litres.

30. How many litres of water can a water tank 8cm by 6cm by 3cm hold? ($1000cm^3$ – 1 litre) A. 144000litres B. 1440litres C. 1400litres D. 144litres.

31. How many digits are there in 1million?
A. 1 B. 6 C. 7 D. 9.

32. A quadrilateral with four equal sides and four equal angles is called _____
A. Rhombus B. Square C. Kite D. Rectangle.

33. How many 250g of sugar can be obtained from 3.25kg?
A. 25g B. 13g C. 12g D. 10g.

34. Find the circumference of a circle whose radius is 3 ½ cm?
A. 22cm B. 44cm C. 77cm D. 154cm.

35. The total weight of Hussaina, Uche, Affiong and Titi is 200kg. If Farida, a fifth girl weighs 60kg, find the average weight of the five girls.
A. 50kg B. 52kg C. 55kg D. 60kg.

36. The perimeter of a rectangular room is 60cm. What is the length of the room if the width is 12m?
A. 5m B. 18m C. 36m D. 48m.

37.

	Hrs	Mins	Secs
	5	18	32
-	3	18	46

_____

A. 1hr 49mins 46secs B. 1hr 49mins 56secs C. 1hr 59mins 46secs D. 1hr 59mins 56secs.

38. The edge of a equilateral triangle is 11.06cm. What is the perimeter of the triangle?
A 43.18cm B. 33.18cm C. 22.19cm D. 16.59cm.

39. What is the angle between the hour hand and the minute hand at 4'0clok?
A. 45^0 B. 60^0 C. 90^0 D. 120^0.

40. Increase 250 by 60%.
A. 90 B. 120 C. 180 D. 400.

41. Electric poles stand in straight row 50metres apart. What is the distance from the first pole to the 15^{th} pole?
A. 750metres B. 700metres C. 650metres D. 600metres.

42. Find a number such that when it is tripled and 5 is subtracted, the result is 40.
A. 15 B. 20 C. 25 D. 45.

43. Ugwu has m mangoes and buys two more mangoes. How many mangos has Ugwu altogether?
A. m /2 B. 2-m C. m +2 D. 2m.

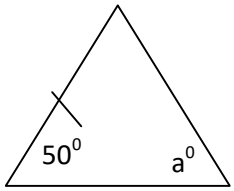
44. Evaluate 2.908 + 0.0285 + 1.758 + 456.67.
A. 3645.461 B. 645.361 C. 461.3645 D. 3.46145.

45. A _____ is a rectangle in which all the sides are the same length.
A. Triangle B. Square C. Kite D. Polygon

46. What is the correct name for a thousand million?
A. Thousand B. million C. billion D. Trillion.

47. One of the following is a prime factor.
A. 9 B. 11 C.15 D. 21.

48. Find the size of the angle marked by a letter in the diagram below
A. 50^0 B. 60 C. 65^0 D. 75^0



49. A salesman walks 3.5km in 1hr. in 2 ½ hours he walks.
A. 8 1/4km B. 8 3/4km C. 8.1km D. 17 1/2km.

50. 30litres of petrol at 9 1/2kobo per litre cost.
A. N1.70 B. N2.25 C. N2.52 D. N2.85.

APENDIX VI

INSTITUTE OF EDUCATION

UNIVERSITY OF IBADAN

SAMSE INSTRUCTORS KNOWLEDGE AND PERCEPTION OF THE SAMSE PROGRAM QUESTIONNAIRE (STKPSPQ)

The aim of this questionnaire is to elicit information based on SAMSE program for primary schol Instructors. Kindly fill this questionnaire with as much honesty as possible, as it would go a long way in ensuring an objective decision on the program. Your response will be treated with utmost confidentiality.

SECTION A

Name of Schol:……..

Location of schol: Rural ( )Urban ( )

Gender: Male ( ) Female ( )

Age: _____

Years of taeching experience: (Eg 2years)…….

Academic qualification: Grade 2 only ( ) NCE only ( )

B.Ed/B.A(ed)/B.Sc (Ed) ( ) B.A/B.Sc/HND + PGDE ( )

M.ED/M.A/MSc./PGDE ( ) PhD ( )

SECTION B:

Knowledge of SAMSE program objectives (FOR SAMSE TEACHER ONLY)

Mention the two (2) objectives of the SAMSE program

_____

_____

SECTION C:

SAMSE Program Instructors' Perception about the effectiveness of SAMSE program

Kindly respond to the following items using the key;

To a large extent, To some extent, and Not at all

S/N	The SAMSE re-trianing program has:	To a large extent	To some extent	Not at all
1.	updated my mathematical knowledge.			
2.	improved my disposition towards Maths taeching			
3.	helped to improve my competence in Maths			
4.	helped to build my potential in Maths.			
5.	helped me to discover innovative taeching techniques.			
6.	improved my knowledge on pedagogy			
7.	helped me to improvise relevant local materials to teach Maths.			
8.	changed my belief about Maths taeching			
9	helped make me feel at ease while taeching Maths			
10.	helped make my classroom taeching interesting			

APENDIX VII

INSTITUTE OF EDUCATION
UNIVERSITY OF IBADAN
SAMSE PROGRAM INSTRUCTORS' QUESTIONNAIRE (SPTQ)

The aim of this questionnaire is to elicit information on the SAMSE re-trianing program for primary schol Instructors. Your response will be treated with utmost confidentiality.

SECTION A

Gender: Male ( ) Female ( )

Location of schol: Rural ( ) Urban ( )

Age:_____

Years of taeching experience: (eg 2years)……

Academic qualification: Grade 2 only ( ) NCE only ( )

B.Ed/B.A(ed)/B.Sc (Ed) ( ) B.A/B.Sc/HND + PGDE ( )

M.ED/M.A/MSc./PGDE ( ) PhD ( )

No. of times trianing was attended: One time ( ) Two times ( ) Three times ( ) More than three times ( )

SECTION B – Part 1

Kindly respond to the following items using the following keys:

VGE – Very Great Extent

GE – Great Extent

ME – Moderate Extent

LE – Little Extent

S/n	Items	VGE	GE	ME	LE
1.	The instructional materials used during the trianing program was adequate				
2.	The instructional techniques used were learner centred.				
3.	The Maths taeching skills gained during the program were adequate.				
4.	Instructional materials used during the program were relevant to the subject matter taught.				
5.	The taeching-learning process was interactive.				
6.	The taeching skills gained could be easily put into practical use in the classrooms.				
7.	The program was properly oragnised in my centre.				
8.	The trainers for Maths had mastery of what they taught.				
9.	The length of the re-trianing exercise was overloaded with too many activities.				
10.	The length of the re-trianing program was inadequate.				
11.	Interaction among the participants during the trianing program was inadequate.				
12.	The quality of the program needs to be improved upon.				
13.	Trainers allowed contributions in the classroom.				
14.	Participating Instructors were able to present their own area of expertise during the trianing.				
15.	There was room for demonstration of interpersonal skills among the participants during the trianing.				
16	The in-built practical lesson was not adequate.				
17.	Trainers gave room for practical lesson during trianing.				
18.	Trainers gave room for interactive communication between them and SAMSE program Instructors during trianing.				

SECTION B- Part 2

Kindly respond to Section C as applicable to you, using the key section

Key

4 – Excellent

3 – Very good

2 – Fair

1 – Poor

		4	3	2	1
1.	How relevant is the program to you?				
2.	How necessary is the program?				
3.	How would you rate the trianing venue?				
4	What is your impression of the trainers?				
5	How would you rate the manual of the program?				
6.	How adequate is the content to your taeching subject?				
7.	How the course has improved my taeching skills?				
8..	How would you rate the timing of the program?				

Section B Part 3

Kindly respond to section D as applicable to you using the following key format
VGE – Very Great Extent – 4, **GE** – Great Extent – 3, **ME** – Moderate Extent – 2,
LE – Little Extent – 1

S/n	Strengths and weaknesses of the program	VGE	GE	ME	LE
1	There were large turnout of Instructors for the program.				
2	The program created awareness on taeching skills.				
3	The manuals were adequate in my centre.				
4	Equal distribution of time to all modules regardless of subject area.				
5	Pedagogical materials given to Instructors at the end of the workshop were useful.				
6	There were professional interaction among the trainers.				
7.	Instructional materials were provided during the trianing.				
8.	There was provision of security at the trianing venue.				
9.	There was provision of generator where there is no electricity.				
10.	There are enough classroom for participants.				

	To what extent did the trainees use the following:				
11	Practice after each session of the program				
12	Improvisation for taeching				
13	Use of questioning				
14	Activity based learning				
15	Peer tutoring				
16	Outdoor activities				
17	Story telling				
18	Active participation of trainees				
	Levels of interaction				
19	Learner-learner				
20	Teacher – learner				
21	Teacher – whole class				
	Assessment during instruction				
22.	Class work				
23.	Take home assignment				
24.	Test				

APENDIX VIII
INSTITUTE OF EDUCATION
UNIVERSITY OF IBADAN
INSTRUCTORS' DISPOSITION TOWARDS MATHS TAECHING QUESTIONNAIRE (TATMTQ) (FOR SAMSE AND NON-SAMSE INSTRUCTORS)

The aim of this disposition scale is to find out the disposition of primary schol Instructors towards Maths taeching. Kindly respond to this scale as objectively as possible. Your response will be treated with utmost confidentiality.

SECTION A

Name: _____

Name of schol: _____

Location of schol: Rural ( ) Urban ( )

Age: _____

Gender: Male ( ) Female ( )

Years of taeching experience: (eg 2years)……

Academic qualification: Grade 2 only ( ) NCE only ( )

B.Ed/B.A(ed)/B.Sc (Ed) ( ) B.A/B.Sc/HND + PGDE ( )

M.ED/M.A/MSc./PGDE ( ) PhD ( )

SECTION B

Kindly respond to the following items using the following keys:

Always true of me – **ATM**

True of me – **TM**

Fairly true of me – **FTM**

Not true of me **- NTM**

S/N	Instructors' disposition to learners	ATM	TM	FTM	NTM
1.	I ensure that learners are actively involved in the Maths taeching learning process.				
2.	I give attention to learners areas of difficulty in Maths				
3.	I encourage low-achieving learners in Maths.				
4.	I give consideration to individual differences among learners in Maths.				
5.	I motivate high-achieving learners.				

6.	I ensure that learners interact with the instructional materials in Maths.				
7.	I praise students to reinforce positive behaviour in them.				
	Disposition to taeching				
8.	I enjoy taeching Maths				
9.	I attend Maths class promptly				
10.	Making effort to improve my knowledge in Maths is my priority.				
11.	Attending workshops and seminars in Maths make me feel delighted.				
12.	I am eager to apply knowledge gained in workshops and seminar.				
	Use of Instructional Material				
13.	I use instructional materials to facilitate understanding of Maths				
14.	I love improvising instructional materials to improve students' learning in Maths.				
	Disposition to Taeching Techniques				
15.	I found strategies that involve pupil-pupil activity difficult to achieve.				
16.	I am eager to use modern innovative techniques in Maths.				
17.	I often vary instructional techniques during lessons.				
18.	I give assignments regularly in Maths lesson				
19.	I conduct diagnosis into student areas of difficulties.				
20.	I give feedback to the students.				

APENDIX IX

INTERNATIONAL CENTRE FOR EDUCATIONAL EDUCATION

INSTITUTE OF EDUCATION

UNIVERSITY OF IBADAN

IBADAN

LEARNERS' DISPOSITION TOWARDS MATHS LEARNING SCALE

(PATMLS)

The following statements are meant to find out learners' disposition towards learning of Maths. For each statement, you are required to respond by ticking (√) in any columns

SECTION A

NAME OF SCHOL _____

CLASS _____

LOCATION OF SCHOL: RURAL [ ] URBAN [ ]

AGE _____ **SEX**: MALE [ ] FEMALE [ ]

SECTION B

Kindly respond to the following items using the following keys

Strongly Agree – 4, **Agree** – 3, **Disagree** – 2, **Strongly Disagree** – 1

S/N	Items	4	3	2	1
1	The environment for learning Maths is not okay.				
2	There is good relationship between Maths teacher and the learners.				
3	I like to discuss Maths with my friends.				
4	I offer Maths because it is a compulsory subject.				
5	Due to inadequate Maths Instructors, many learners play truancy.				
6	Maths is one of my best subjects.				
7	There are enough Maths Instructors in my schol.				
8.	My Maths Instructors are not capable				
9.	It is easy to understand Maths				
10.	Only bright learners should study Maths				
11	Maths is very easy to pass if the learners are ready to learn during the taeching and learning process.				
	Disposition to learning				

12	I enjoy studying Maths.				
13	I always attend Maths class.				
14	I study Maths mainly to have admission to secondary schol.				
15	What we learn in Maths is very useful in everyday life.				
16	I answer Maths questions during lesson.				
17	I feel tired with too many formulae in Maths.				
18	I don't like doing Maths assignments.				
19	I pay more attention to my Maths teacher during the lesson.				
20	If I can't solve a problem, I keep trying different methods.				
21	No matter how hard I tried, I still find it difficult to solve Maths problems.				
22	Maths is learnt through constant practice.				
23	I am always late to mathematic lesson.				
24	I have no interest in Maths				
25	Studying Maths textbooks helps a lot.				
	DISPOSITION TO LEARNING TECHNIQUE				
26	I find the method used by Maths teacher very interesting				
27	I understand better when my teacher uses taeching aid that I can see.				

APENDIX X

INTERNATIONAL CENTRE FOR EDUCATIONAL EVALUATION, INSTITUTE OF EDUCATION

UNIVERSITY OF IBADAN, IBADAN

STRENGTHENING MATHS AND SCIENCE EDUCATION PROGRAM APPROACH OBSERVATION SCALE (SAMSEPAOS)

ASEI: Activity-Focused, Student Centred Learning, Experiments, Improvisation

PDSI: Plan, Do, See, Improve

PART 1 SECTION A

Name of Teacher: _____

Location of schol: Rural [ ] Urban [ ]

Teacher Qualification: _____ _____ **Age**: _____

Date: _____ **Time:** _____ **Gender:** Male [ ] Female [ ]

Subject Taught: _____

Topic: _____ **Sub-topic**: _____

SECTION B

Kindly rate to the following using the rating scale below:

(**Adequately** – 4, **Fairly Adequate** – 3, **A little** – 2, **Not at all** – 1)

Plan		**1**	**2**	**3**	**4**
P_1	Maths lesson note takes into account learners' backgrounds such as previous experience in relation to the topic.				
P_2	Maths lesson note is appropriate and realistic in terms of Lesson content and learners' ability				
P_3	Availability of Instructional material				
Do	Taeching / Instruction				
Introduction					
D_1	Introduction incorporates previous knowledge and links them to the new topic.				
D_2	Introduction matches the content the instructor wanted the learners to grasp.				
D_3	Introduction is stimulating enough to arouse the interest and curiosity of the learners.				
Development					
D_4	Lesson encourages learners to express their prior experience				
D_5	Lesson encourages learners to give their own observation in the activity.				
D_6	Lesson facilitates growth of process skills such as observing, measuring, classification, calculation etc.				
D_7	The lesson encourages active participation of learners in the main taeching steps.				
Conclusion					
D_8	The lesson assists learners to link content to what they come across in the society.				

Class management					
D_9	The teacher organizes and conducts lesson taking into account the individual differences				
Instructional material/media					
D_{10}	The teacher makes effective use of the taeching and learning materials/media				
See (evaluation)					
S_1	Teacher supervises class work				
S_2	Teacher is attentive to the needs of learners with low and high academics liability.				
S_3	Teacher keeps eye contact on learners to monitor their feelings.				
S_4	Teacher checks the accuracy, correctness, depth and appropriateness of the content through question and answer techniques.				
Improve					
I_1	Teacher gives further guidance to learners on lesson activities.				
I_2	Teacher makes appropriate adjustment in the conduct of the lesson.				
ASEI					
Activity	The lesson is activity-focused: a) Practical work is conducted				
	b) tasks in line with contents				
Student involvement	The lesson is learners-centred a) Learners are effectively encouraged to give their prior experiences				
	b) Learners are effectively encouraged to give their own observation in the practical work and to discuss how they differed from those of other.				
Experiment effectiveness	The practical work helps to achieve the objective(s) of the lesson: a) Learners are able to solve related problems.				
	b) Learners are able to relate the result of activity to the content				
Improvisation	Improvisation is practised during the lesson (a) Teacher produces and utilizes improvised materials				
	(b) Learners are able to use improvised materials effectively				
	(c) Learners' participation is increased.				

PART 2

LEVEL OF COMPLIANCE OF SAMSE PROGRAM INSTRUCTORS ON SAMSE PROGRAM APPROACH

VGE – Very Great Extent; **G.E** – Great Extent; **ME** – Moderate Extent; **LE** – Little Extent

S/N	Items	VGE	GE	ME	LE
1.	Used adequate instructional materials in the classroom				
2.	Used learner centered techniques while taeching				
3.	Divided students into groups while taeching.				
4.	Used Instructional materials that were relevant to the subject matter taught.				
5.	Taeching-learning process was interactive.				
6.	Activity-based learning was put into practical use.				
7.	Allowed learners' contributions in the classroom.				
8.	Demonstration of interpersonal skills during taeching.				
9.	Gave room for practical lesson during taeching.				
10.	Gave room for interactive communication between them and learners during taeching.				
11.	Taeching was properly organized.				
12.	Had knowledge of subject matter				
13.	Taeching was overloaded with too many activities.				
14.	Length of the taeching in the classroom was adequate				
15.	Interaction among the learners during the trianing taeching was adequate.				
16	Demonstrate his/her own area of expertise.				
17.	In-built practical lesson was adequate.				

MARKING SCHEME FOR PMAT

1. C	11. D	21. B	31. B	41. A
2. C	12.A	22. A	32. B	42. A
3. A	13. D	23. B	33. B	43. C
4. B	14. B	24. C	34. A	44. C
5. D	15. A	25. C	35. B	45. B
6. C	16. D	26. A	36. B	46. C
7. B	17. B	27. C	37. C	47. B
8. D	18. C	28. C	38. B	48. C
9. B	19. C	29. B	39 D	49. B
10. B	20. D	30. C	40. D	50. D

SENATORIAL DISTRICTS

LOCAL GOVERNMENT AREAS IN OYO CENTRAL

Egbeda	Afijio	
Lagelu	Oyo west	
Akinyele	Oyo East	Ogbomoso south
Oluyole	Atiba	
Ona-Ara	Olorunsogo	

LOCAL GOVERNMENT AREAS IN OYO SOUTH

Ibadan North	Ido
Ibadan North East	Ibarapa North
Ibadan South East	Ibarapa East
Ibadan South West	Ibarapa Central
Ibadan North West	

LOCAL GOVERNMENT AREAS IN OYO NORTH

Atisbo	Ogo Oluwa
Irepo	Oorelope
Iseyin	Oriire
Itesiwaju	Saki East
Iwajowa	Saki West
Kajola	Surulere
Ogbomoso North	

SELECTED TEN LOCAL GOVERNMENT AREAS

OYO CENTRAL	OYO SOUTH
Egbeda	Ibadan South East
Lagelu	Ibarapa North
Afijio	Ibarapa East

OYO NORTH
Atisbo
Kajola
Iseyin
Ogbomoso North