

AN ABSTRACT OF THE THESIS OF

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Title: The Perceived Need for Inservice Training to Improve the Teaching of Mathematics in Primary Schools in Bendel State of Nigeria

Redacted for privacy

Abstract approved: _____

~~Dr. G. R. Girod~~

Purpose: The study assessed the perceived need for inservice training to improve the teaching of mathematics in primary schools in Bendel State of Nigeria. Specifically, the study sought to know where and when the primary school mathematics teachers need inservice training to improve their standards of teaching elementary mathematics. The areas assessed were: the need for more knowledge, curriculum management, teaching strategies, behavior management, evaluation procedures, instructional materials, and the time preferred for inservice training.

One hundred and forty-four (144) primary school teachers served as subjects in the study. There were 67 males and 77 females.

Procedure: Three questionnaires (A, B and C) were designed to obtain the following information from the primary school teachers: (1) personal information, (2) professional education, (3) profes-

sional experience, (4) perceived need for inservice training to improve the teaching of mathematics in primary schools.

Information obtained from 144 returned questionnaires (100%) was tabulated and the data were examined using descriptive statistics (mean and standard deviation) and the Pearson Product Moment Correlation to compute the reliability of 26 duplicated items in the questionnaire.

Findings: The 144 primary school teachers who took part in the study expressed their need for training ranging from extensive to very little in the areas investigated. The subjects indicated a higher need for training in the area of curriculum management than the other areas investigated.

One major finding from this study was that the test is made up of reliable items. The reliability of the individual items accepted ranged from .50 (moderate) to 1.00 (very dependable relationship). The primary school teachers who took part in the study agreed that elementary math inservice education would help them to know better how to teach elementary mathematics to their primary school students.

The implications for the mathematics inservice training of these elementary school teachers were discussed and future research suggestions were also recommended.

THE PERCEIVED NEED FOR INSERVICE TRAINING
TO IMPROVE THE TEACHING OF MATHEMATICS
IN PRIMARY SCHOOLS IN
BENDEL STATE OF NIGERIA

By

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Typed by Christina Washington O'Bryan for Gabriel O. Iloh

DEDICATION

I dedicate this thesis to my family and my uncle, Onyema Okwu.

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THE PERCEIVED NEED FOR INSERVICE TRAINING TO IMPROVE THE
TEACHING OF MATHEMATICS IN PRIMARY SCHOOLS
IN BENDEL STATE OF NIGERIA

Chapter I

INTRODUCTION

Purpose of Study

The purpose of this study was to assess the perceived need for inservice training to improve the teaching of mathematics in primary schools in Bendel State of Nigeria. Specifically, the study sought to know which were the needed topics and when the primary school mathematics teachers in Bendel State of Nigeria wanted inservice training to improve their standard of teaching mathematics. The study investigated the need for inservice training in terms of: the need for more knowledge, curriculum management, teaching strategies, behavior management, evaluation procedures, instructional materials, and the time preferred for inservice training.

The Background of the Study

The results of Teachers' Grade Two Examinations, 1973-1983, published by the West African Examinations Council, Yaba, Lagos, Nigeria, indicated that most of the grade two teachers narrowly escaped failing their mathematics final examinations. Furthermore, the 1973-1983 grade results showed that the majority of

these primary school teachers did not even pass the Arithmetic Process/ Basic Mathematics.

The West African Examinations Council results of 1973-1983 also indicated that some teachers who attended secondary grammar school did not pass mathematics in their West African School Certificate Examinations.

Looking at these primary school teachers' mathematics records kept by their principals, there is little doubt that most of them will not be able to teach mathematics as expected in primary schools. In the light of these circumstances, inservice training seems necessary to help to upgrade the performance of these teachers so that they can meet the continuously changing needs and aspirations of students.

Statement of the Problem

It is a great pity that most primary school teachers in Bendel State of Nigeria are teaching mathematics with limited information. The Commissioner of Education for the Imo State of Nigeria (1982) stressed that the problem of mathematics is now nationwide. According to the Commissioner, more than forty-two percent of primary school pupils failed mathematics in their final examinations. He wondered how the children could do well in such courses as engineering and medicine if the trend of failure in mathematics remained unchecked.

The terminal results of (1973-1983) kept by principals of teachers' training institutions and secondary schools in Bendel

State showed that many of the students were not doing well in mathematics classes because they lacked the solid background that they should have acquired when they were in primary school.

Due to existing problems, the need for inservice training for elementary mathematics teachers in Bendel State of Nigeria is a sine qua non if many Bendel State children in primary schools are to perform as expected in elementary mathematics.

Objectives of the Study

The objective of the study was to find whether the primary school teachers in Bendel State of Nigeria believed that they needed inservice training to improve their standard of teaching elementary mathematics. The study also sought to determine the areas in elementary mathematics in which teachers needed help and the preferred times for such training. Recommendations and implications were stated for future inservice training.

Chapter II

REVIEW OF RELATED LITERATURE

Introduction

This chapter is devoted to literature pertaining to the inservice training of teachers in general as well as mathematics teachers. Literature related to the problems and needs of primary teachers in the areas of mathematics instructions will also be reviewed.

Most of the related literature studied was not from Nigeria. However, the knowledge gained from the studies examined can be applied in assessing the perceived need for inservice training to improve the teaching of mathematics in primary schools in Bendel State of Nigeria.

The Need for More Knowledge or Inservice Training

Inservice training comprises those experiences which are designed to improve the performance of primary school teachers in their assigned responsibilities. Furthermore, inservice education can help primary school teachers to meet the continuously changing needs and aspirations of their classroom children.

According to Friedman (1980), inservice education contributes to professional development. Orrange and Rye (1975) stated that inservice education was planned to upgrade the competencies, knowledge, skills and attitudes required by school personnel in the

performance of assigned goals or duties. Henderson (1978) also pointed out that, in 1965, the United States Department of Health, Education and Welfare described inservice education as a program designed to increase the skills of staff members during the period of their service to the school system. Hass (1957) stated that preservice education could not adequately prepare teachers for their responsibilities. Inservice education is, therefore, essential to enable teachers to be current in the teaching of elementary mathematics to their classroom children.

Kersh, Collins, Jalbert, Massanari and Meshover (1978) stated that inservice education helped the members of the teaching profession to improve their methods of teaching.

Gerlach (1983) stressed that effective inservice for regular educators would continue to be a critical need for teacher training programs, state educational agencies, local school districts and teacher organizations.

Regarding the problems and needs in preservice elementary school mathematics programs in Thailand, Suvapunt (1980) found that local teacher training institutions should persuade elementary school teachers to come back to the teacher training institutions or the universities and enroll in mathematics content and methods courses, since it was necessary for them to learn more. It was found that elementary school teachers most often asked for help from their mathematics children in teaching mathematics as well as from other good mathematicians in their schools.

After reviewing several studies on the mathematical backgrounds of elementary school teachers, Sparks stressed that elementary teachers of mathematics were considered by many authors to be:

- a) Particularly deficient in understanding of underlying principles.
- b) Deficient in computational skills, particularly with decimals and percents.
- c) Deficient in problem solving ability. (1961,pp.395-403).

Ruddel, Dutton and Reckzeh (1960) pointed out that every teacher admitted to elementary teacher training programs should be made to take a minimum of six semester hours of background mathematics. Furthermore, all elementary school teachers should have a course in teaching arithmetic which should follow the background and sequence in mathematics.

Dienes noted that

...the fact that mathematics is found difficult or unpleasant or both by so many people testifies to the existence of real learning difficulties. The curious fact is that these difficulties have never been systematically or scientifically studied, and consequently our knowledge of the process of learning mathematics is so scanty as to hardly amount to knowledge at all.

(1963,p. 24)

Linville asserted that "inservice training in mathematics for elementary teachers will be much more extensive in the future than it is today" (1970, p. 109). Linville further emphasized that, since most of the elementary school teachers were inadequately

prepared to teach mathematics, inservice education would help to upgrade the skills of these elementary school teachers in teaching mathematics to their classroom children. In addition,

...as further support for inservice education, colleges and universities will provide more summer session courses in elementary mathematics, and extension centers will offer the experienced teacher an opportunity to gain the fundamental knowledge background so necessary to effective teaching of newer mathematics programs.

(1970, p. 109)

Summary of Ideas, Concepts or Principles

In light of the foregoing conclusions, inservice training can serve as a tool to help elementary mathematics teachers upgrade their skills in teaching mathematics. The related literature consistently indicates that inservice education is necessary in order to retrain teachers of elementary mathematics. The literature regards the retraining exercise as an attempt to upgrade the performance of teachers to meet the continuously changing needs and aspirations of children. Furthermore, inservice education can help primary school mathematics teachers to be current in teaching elementary mathematics to their pupils.

Curriculum Management and Development

Curriculum management and development, as used here, refer to the process of planning primary mathematics.

Writing about the needs of the curriculum and the needs in teacher education, Davis stressed that his own remarks were based

upon one view of the future needs of the mathematics curriculum in primary school. What, he asked, are the needs of the elementary curriculum in the next few years? Primarily these, he answered:

- a) An early introduction of the 'big ideas' of mathematics
- b) Replacing 'arithmetic' with a combination of arithmetic, algebra, geometry and science
- c) Developing a more student-centered approach to classroom instruction in mathematics
- d) A greater emphasis on student creativity and originality
- e) A more extensive use of physical materials in the mathematics classroom
- f) More emphasis on individualized instruction in mathematics
- g) Freeing the curriculum from its present bondage to grade levels and textbooks series
- h) Teaching a great deal more mathematics in the elementary school than is ordinarily done at present.

(1965, p. 477)

The goals espoused by Davis would definitely help the primary school math teachers in their curriculum development and management activities. The big problem, according to him, is that most of these elementary mathematics teachers lack the skills needed for elementary curriculum planning and development, especially in a developing country. He stressed that inservice education would equip elementary teachers of mathematics with the necessary skills required in planning or developing elementary mathematics curriculum.

Kramer quoted as follows from what Francis Keppel, the former Commissioner of Education wrote during the famous Cambridge Report, Massachusetts in 1963:

The present report is a step...it is characterized by a complete impatience with the present system. It is not only that most teachers will be completely incapable of teaching most of the mathematics set forth in the curricula proposed here, most teachers would be hard put to comprehend it. No brief period of retraining will suffice. Even the first grade curriculum embodies notions with which the average teacher is totally unfamiliar.

Nonetheless, these are the curricula toward which the school should be aiming...Can the goals set forth in this report be trusted? Can we be confident that the curricula set forth here will indeed be the optimum curricula for 1990? It should not disturb us to realize that any such confidence would be completely unwarranted.

(1970, p. 20)

As a matter of fact, the commissioner had seen that teachers not only lacked the skills required to teach mathematics, but also lacked the skills to plan the curriculum in a more effective manner. He, therefore, stressed that a brief inservice education would help primary school teachers to know how to plan and develop elementary mathematics curriculum better.

In his theory of instruction, Jerome Bruner noted that:

A body of knowledge is the result of much intellectual activity. To instruct someone in these disciplines is not a matter of getting him to commit results to mind. Rather, it is to teach him to participate in the process that makes possible the establishment of knowledge. We teach a subject not to produce little living libraries on that subject, but rather to get a student to think mathematically for himself, to consider matters as a historian does, to take part in the process of knowledge getting. Knowledge is a process, not a product. (1966, p. 72)

In this case, primary school curricula should be planned or developed in order to get the mathematics students to think mathematically for themselves, and to take part in the process of knowledge getting. Since the primary school math teachers lack the skills of elementary curriculum planning and/or development, inservice training will help to provide the required skills they are lacking.

Though the related literature stated below treats curriculum planning and management in a general form, it really indicates that teachers of all levels will need inservice education in order to be aware of any changes or adjustments in a curriculum. Volk pointed out that, after the national survey study of curriculum needs perceived by professionals, it was found that, "the needs for inservice teacher education are perceived as considerable at all academic levels" (1983, p. 132A). Volk recommended that immediate and extensive inservice teacher education efforts, as well as the development of curricula, were required. The literature clearly supports inservice education in order to improve the teachers' skills needed to plan the curriculum in their schools.

Lerch (1970) stressed that inservice programs were important because they provided an orderly, planned basis for implementing the mathematics curriculum and for working toward its improvement. Inservice education would provide the required skills which most primary school mathematics teachers lacked. Because they lacked these skills, they would not be able to plan a better math curriculum. Lerch further stated that inservice education was essen-

tial because a mathematics program which seeks to meet the future, as well as the present, needs of the students must constantly be modified. This, in turn, requires that primary school teachers and their supervisors be continually involved in efforts to improve the teaching and planning of elementary mathematics. Lerch asserted that inservice education should provide a foundation for change and the means by which plans for teaching primary mathematics are implemented successfully.

Summary of Ideas

Teaching primary school mathematics is an ever-changing scene. Inservice enables teachers to be aware of these changes when they are developing mathematics curricula. Planning for a changing mathematics curriculum should, therefore, provide for continuous inservice training of mathematics teachers, in both math content and methods of mathematics instruction.

Teaching Strategies

Teaching strategies are any methods employed by the classroom teacher to make his or her teaching more meaningful to the children in his or her class. Consequently, if the strategies are well-applied, the children will understand the content better and more interest on the part of the children will be promoted.

Regarding inservice education for untrained teachers in rural primary schools in Imo State of Nigeria, Nkere (1981) stressed

that the teachers concerned expressed the need for more training just to upgrade the standards of their teaching strategies. Nkere stated that such training would require a cooperative effort by all educators, government officials and community at large.

According to Singer and Donlan (1980), through inservice training, teachers accommodated new teaching strategies which would help them to perform their assigned goals in their classrooms.

In seeking to identify and describe the preservice and inservice education of selected elementary school teachers of mathematics in selected parishes of southwestern Louisiana, to identify the stated problems and needs of these teachers, Abshire (1973) stressed that more than two-thirds of the respondents had no graduate semester hours in mathematics content courses. Abshire further pointed out that slightly less than 75 percent had no graduate semester hours in mathematics teaching methods, and more than 50 percent of the respondents employed whole class instructional approach in teaching mathematics. Abshire also emphasized that the respondents indicated demonstration lessons as the most beneficial inservice program. Furthermore, the respondents were willing to seek help in teaching math from their fellow teachers.

Newman (1971) stated that

...there are two ways to teach mathematics. One is to take real pains towards creating understanding, visual aids, that sort of thing. The other is the old British system of teaching until you are blue in the face.

(1971, p. 1)

Most elementary school teachers could not teach what they know to their children in a more effective manner. In this respect, Newman stressed that the teachers lacked effective strategies in teaching mathematics.

In a study on problems and needs in preservice elementary school mathematics programs in Thailand, Suvapunt (1980) noted that, "the majority of respondents ranked methods and techniques of instruction as the most desirable preservice topic" (1980, p. 4).

Commenting about possible causes of poor performance in the solving of verbal problems, Kramer stated that "the classroom climate is not conducive to a proper learning situation" (1970, p. 353). Kramer stressed that teachers lacked skills in directing class discussions and, as a result, children hesitated to volunteer an answer for fear of making a mistake. Kramer concluded that, in such a situation, the teacher had not succeeded in establishing a relaxed atmosphere in which the child's thinking was stimulated and constructively corrected. Most teachers lack elementary mathematics teaching strategies. Inservice education will then help to provide a reasonable answer to the problems of teaching strategies in primary mathematics.

Summary of Ideas

For a teacher to be more efficient in teaching elementary mathematics, he or she should engage in a kind of training that

will help him or her to know more about teaching strategies in elementary math.

As a matter of fact, the review of literature demonstrates that primary school teachers need to become familiar with a variety of techniques or strategies in teaching elementary mathematics, since children are at different levels of thinking and development in learning mathematics.

Behavior Management

Behavior management is any method employed by the teacher to help him or her minimize disruptive behaviors in the classroom.

In a study on the professional development of inservice teachers in Saudi Arabia, Al-Ghamdi (1982) stated that Saudi teachers lacked the skills to eradicate or minimize unsuitable behaviors in their classroom. Al-Ghamdi further noted that the teachers of Saudi expressed the need for more information in handling discipline problems.

Jarolimek and Foster (1981) pointed out that teachers created all sorts of management problems for themselves because they lacked the skills required to handle or deal with behavior problems in their classrooms. Jarolimek and Foster stressed that elementary school teachers did not plan and observe a daily schedule of events in their classrooms because they did not know how to do it, and would therefore contribute to management problems.

Lovitt (1978) emphasized that teachers had management problems, or inappropriate behaviors in their classrooms because they did not know how to handle these inappropriate behaviors when they arose in their classrooms.

Arnold (1971) indicated that preservice and inservice training helped math teachers to upgrade their skills in class management. Flow-chart lesson plans were developed and successfully taught by preservice and inservice teachers.

Sloane (1976) stated that teachers lacked the necessary skills required to deal with the problems of classroom management.

Woolfolk and Nicolich stated that teachers misused attention to reinforce changes in student behavior because they lacked classroom management skills. Recognizing the lack of skills on the part of primary school teachers in dealing with behavior management, Woolfolk and Nicolich (1980) provided methods that focus on positive behavior, methods for developing new behaviors, methods for coping with undesirable behavior, group responsibility, special program for classroom management, self management for students and problems and issues. This process can serve as a basis for inservice training.

Summary of Ideas

From the review of related literature, the researcher noted that many primary school teachers lacked skills in handling disciplinary problems in their classrooms. Most teachers expressed the need for more knowledge in the area of behavior management.

The related literature views inservice education as a process which will help the primary school teachers to know how to handle discipline problems in their mathematics classes.

Evaluation Procedures

The author regards evaluation as the inspection of all information available concerning the students to ascertain the degree of change in the students and to make valid judgments concerning the educational program being used.

In a study on the professional development of inservice teachers in Saudi Arabia, Al-Ghamdi (1982), found that the Saudi teachers, administrators and supervisors in the Jeddah city school district indicated that teachers needed inservice education in evaluating and assessing children's achievements.

In a study on staff development programs in Ghana, an analytical study of the growth and development of inservice education for elementary school teachers, Hayford (1981) stated that, before 1961, most of the inservice education was directed to "under-trained and provisional teachers" while inservice education for trained and certified teachers was not enough. Even though the current aims and objectives of Ghanaian inservice education were considered to be adequate for a lot of teachers, they lacked a comprehensive scope that could help program planners to achieve specific objectives. Hayford pointed out that "the investigations revealed that Ghanaian teachers were deprived of much recent

thinking, innovative, educational technology, systematic instructional design, research, and evaluation techniques" (1981, p. 143). In this aspect, Hayford pointed out that Ghanaian teachers also needed assistance, among other concerns, in evaluation techniques.

In a study on the evaluation styles, methods, and modes preferred by middle school teachers and administrators in an urban setting, Miller (1981) stated that there was a strong feeling among the respondents that using more than one type of strategy to make a composite evaluation would give a more accurate and genuine picture of a teacher's effectiveness and would be more acceptable to the students being evaluated or graded. It seems, therefore, that Miller's subjects believed that they needed to know more about evaluation.

Commenting about new directions in the measurement of mathematical ability, Madden stated that

evaluation of mathematical competence needs to include measures of fluency in applications and in number of facility. Of greater importance is measurement of the tendency and ability to think as mathematical people think, to define the problems precisely, to state them succinctly and to relate them quantitatively to whatever is appropriate. Evaluation and instruction will progress together, each dependent upon the other.

(1970, p. 424)

Summary of Ideas

The review of literature about the evaluation of children's achievements shows that teachers need help in this area. Strictly

speaking, evaluation is not easy. However, using more than one type of strategy will help to give a more accurate and satisfactory picture of a teacher's method of grading students' achievements in the classroom.

Instructional Materials

Instructional materials include any concrete object used to enhance learning.

In a study on problems and needs in preservice elementary school mathematics programs in Thailand, Suvapunt (1980), stated that the respondents reported that concrete objects were the most beneficial instructional aids or materials in teaching mathematics to the classroom children. However, most of the primary school teachers still lacked the skills required to use these instructional materials.

Commenting about the instructional materials, Kelly, Kaufman and Robinson (1967) pointed out that elementary school teachers should be given training on how to use and apply instructional materials in teaching primary school mathematics. In this respect, Kelly, Kaufman and Robinson noted that elementary math teachers lacked the skills of using and applying instructional materials to teach mathematics to their primary school children. The authors recognized inservice training which would help to upgrade teachers' skills in using instructional materials.

Buffie pointed out that

...in spite of the fact most educators recognize the importance of using concrete materials in mathematics instruction throughout the elementary school, there is a real lack of corroborating evidence that anyone practices what everyone seems to be preaching beyond the third grade. Primary school teachers would not think of introducing various number concepts without using concrete materials. Yet instruction at the intermediate level dealing with difficult concepts, i.e. averages and other number bases, is universally attempted without this decided advantage. Emphasis is almost entirely on mathematical abstractions.

(1975, p. 52)

Ashlock and Herman (1970) stressed that most primary school mathematics lacked instructional materials skills, and as a result of this, the primary school teachers could not use instructional materials in a more effective manner.

Dutton (1961) and Hammond (1964) indicated that planning inservice education for elementary school teachers to upgrade them in teaching the new mathematics and the use of newly adopted state textbooks had become a major administrative problem since the majority of new teachers would enter the teaching profession, and many of these teachers did not know the new mathematics processes and could not use the instructional materials specified for their courses.

These teachers lacked the skills to use the materials provided for the new mathematics. In order to help teachers to know how to use the new materials provided for teaching the elementary mathematics, additional inservice workshops were planned. From the proceedings, it is seen that elementary school teachers actually lacked the skills to use or apply instructional materials

provided for teaching the new primary mathematics. Inservice training provided the answer to the problem.

LeBlanc indicated that, with the changes in the elementary school, there was a need for the re-education of the elementary school teacher. LeBlanc stated: "primary school teachers should know what mathematical aids are available and how they might be used in mathematical labs" (1970. p. 606). Since there had been changes in elementary mathematics, teachers would be helped to know how to use the mathematical aids that were available in teaching primary mathematics to their children. Most teachers lacked the skills necessary to teach primary mathematics to their students.

Summary of Ideas

The review of research about instructional materials shows that most of the teachers lack the required skills in using or applying instructional materials in their mathematics classes. In view of this, the related literature regards inservice education as necessary so that primary school mathematics teachers will know how to use the instructional materials in a more effective manner in their classes. As a matter of fact, the information obtained from the related literature about instructional materials will serve as a co-adjutor to elementary mathematics teachers in teaching and using instructional materials in their classes.

Time for Inservice Education

Time for inservice education is the period used or requested by any teacher to obtain more knowledge in any subject taught in schools.

In a study on effective elements of inservice programs as perceived by Indiana public school teachers, Spears (1981) pointed out that inservice programs should be planned for each semester according to the needs of teachers. In a similar manner, the duration of each session should be determined by the needs of the entire training. Spears concluded that the most desirable time for an inservice education would be during the normal school days with released time for teacher participating.

Listing the tasks educators must face in raising the standard of remediation in Louisiana, Loflin noted: "We must continue our inservice courses in the evenings, on Saturdays and in summer sessions" (1966, p. 85-86). Loflin further stressed that, in doing so, encouragement should be given to the better trained high school teachers to help with the service parish level classes and the study groups of primary teachers.

Summary of Ideas

The review of literature stressed that inservice training should progress throughout the academic year to enable elementary teachers to be up-to-date in the teaching of primary school mathematics.

Therefore, it seems wise to take note of the expressed needs of primary school teachers before planning the time for an inservice training.

Summary of All Ideas from the Entire Related Literature for the Study

It is very interesting to know that the review of related literature supports inservice education to upgrade the skills of primary school teachers in teaching elementary mathematics. The literature emphatically supports more knowledge for elementary school mathematics teachers in seven variables of the study. It is also very interesting to note that the review of the research supports inservice education, irrespective of the standard or grade of the teacher.

The review of related literature reveals that inservice education will not only train the untrained, but will also retrain the trained in teaching elementary mathematics in primary schools. Furthermore, the literature regards inservice education as a process for improving the standard of the teachers' performances. In short, an adequate inservice training will help to overcome this great fear in mathematics.

The researcher believes that the seven variables in the study cover what teachers want to know about elementary mathematics.

Definition of Terms

The term Behavior Management refers to any method employed by the teacher to help him or her to maintain an orderly and positive classroom atmosphere for every child in the classroom.

The term Curriculum Management and Development refers to any technique used to plan elementary mathematics.

The term Evaluation Procedures refers to any method employed by a teacher to assess the skills of his or her classroom children in elementary mathematics taught in the school.

The term Inservice Training is defined as a process for improving the standard of a teacher's performance.

The term Instructional Materials refers to any device, method or experience used for teaching purposes, including textbooks, supplementary reading materials, audiovisual and other sensory materials.

The term Perceived Need in this study refers to the degree of stated need for inservice training by primary school mathematics teachers to upgrade their skills in teaching mathematics. It is measured by the teacher's responses to the questionnaires.

The term Teaching Strategies refers to any direct or indirect instructional method employed by the classroom teacher.

The term Time for Inservice Training refers to the days or hours the primary school mathematics teachers in Bendel State of Nigeria prefer to undertake inservice training during the year.

Chapter III

METHOD AND PROCEDURES

This is a descriptive study to assess the perceived need for inservice training for improving the standard of teaching mathematics in primary schools in Bendel State of Nigeria.

This research effort is designed to analyze the responses of primary school mathematics teachers to a questionnaire. The objectives of this research were: 1) to identify when the primary school mathematics teachers in Bendel State of Nigeria prefer inservice training to improve their standard of teaching mathematics, and 2) to investigate the need for inservice training, regarding the topics of: the need for more knowledge, curriculum management, teaching strategies, behavior management, evaluation procedures, instructional materials.

Research Subjects

One hundred and forty-four (144) primary school teachers teaching in Bendel State of Nigeria were asked to respond to one of three questionnaires. Since the researcher was not there, a teacher, the researcher's uncle, and friends were appointed by the researcher to distribute the questionnaires to the primary school teachers. All the subjects were native Nigerians and the majority of these teachers attended teachers' training institutions, while some of them attended secondary schools. These secondary school graduates, teaching in primary schools, are generally referred to

as untrained teachers. The teachers who attended secondary schools are allowed to teach in primary schools because of the shortage of trained teachers in the State of Bendel.

It is not possible for the researcher to determine whether the sample is representative of the population of Bendel primary school teachers because there is no available information to that effect from the State Ministry of Education. However, information is provided here which will help the reader to know more about primary school teachers who took part in the study. In almost every primary school in Bendel State there are teachers with the following preparations:

1. Grade I Teachers' Certificate -- a teaching certificate issued by advanced teachers' training institution in Nigeria.
2. Grade II Teachers' Certificate -- a teaching certificate issued in Nigeria jointly by the State and the Federal Ministry of Education. This is the basic teaching certificate for all elementary teachers in Nigeria.
3. Secondary School Certificate and General Certificate of Education -- a certificate issued by West African Examinations Council, Yaba, Lagos, Nigeria. The holder of the above certificates is allowed to teach in primary school because of shortage of trained teachers. The two certificates are not teaching certificates.
4. Associate Diploma in Education Certificate -- a teaching certificate awarded by Nigerian universities. This is awarded to

Nigerians who have successfully completed a nine-month course in the University. It is open to teachers who have grade two certificates with not less than five years of teaching experience.

The above educational qualifications are approved by the State and Federal Ministry of Education to teach in a primary school. The local education boards staff the schools and they usually make sure that no school is overstaffed with trained teachers while others have few or none.

Questionnaires

Three different questionnaires were used as instruments for collecting the data for the study.

The Questionnaires: The questionnaires were designed to ascertain information about primary school mathematics teachers' personal and professional backgrounds. Furthermore, the questionnaires were aimed at determining the instructional areas in primary school mathematics in which the elementary mathematics teachers might need additional training. Each questionnaire includes nine duplicated item pairs. The duplicated items at the end of each questionnaire were used by the researcher to determine the degree of relationships between the paired items.

The answer to each question had five options:

5 = Extensively

4 = Moderately

3 = Little

2 = Very little

1 = Not at all

The answers to the duplicated items had five answer choices:

5 = If you strongly agree

4 = If you agree

3 = If you neither agree nor disagree

2 = If you disagree

1 = If you strongly disagree

The researcher included 26 questions in each questionnaire that covered the following headings:

- a) Need for more knowledge
- b) Curriculum management and development
- c) Teaching strategies
- d) Behavior management
- e) Evaluation procedures
- f) Instructional materials
- g) Time for inservice training.

Each questionnaire was constructed in the simplest language which the elementary school teachers would understand. The three questionnaires became Format A, Format B, and Format C, respectively. Each format had 26 questions. The questions on each format were worded exactly the same, but were numbered dif-

ferently. The first nine questions were duplicated at the end of each questionnaire. The duplicated questions enabled the researcher to determine the degree of reliability in the subjects' responses. Furthermore, the primary school mathematics teachers were given a space in the tests (Format A, Format B, and Format C) to state whether they had any other concerns or comments about inservice training. Owing to this addition, each format had 36 questions. The researcher took note of those concerns on item 36 as stated by the primary school teachers.

It is a limitation within this study that there is no efficient method available to test for questionnaire validity.

Table 1. The Item Construction Table for Formats A, B, and C

Variables	Item numbers for Format A	Item numbers for Format B	Item numbers for Format C
1. The Need for More Knowledge	3*,10,11,12,13,14,15,16,17,18,19,21,22,26,29,36	1*,2*,3*,4*,5*,6*,7*,8*,9*,10,12,13,17,20,27,28,29,30,31,32,33,34,35,36	1*,3*,4*,8*,11,18,19,20,21,22,23,24,25,26,27,29,30,34,36
2. Curriculum management	23	14	5*,31
3. Teaching strategies	1*,20,24,27,	11,15,18,	2*,6*,9*,28,32,33,35
4. Behavior management	2*,25, 28	16,19	7*,10
5. Evaluation procedures	4*,30	21	12

Table 1 (continued) --

Variables	Item numbers for Format A	Item numbers for Format B	Item numbers for Format C
6. Instructional procedures	5*,6*,31, 32	22,23	13,14
7. Time of inservice training	7*,8*,9*, 33,34,35	24,25,26	15,16,17

The Explanation of the Above Table

The A, B, and C formats table (see above) covers the following information:

1. The seven variables of the study.
2. The Formats A, B, and C table contain the original item numbers as well as the duplicated item numbers of the test.
3. The duplicated item numbers are the ones marked with an asterisk.

Data Collection Procedures

The questionnaires and cover letters were mailed to the researcher's uncle and friends to distribute to the primary school teachers. Each teacher was instructed to complete only one copy of the questionnaire. The researcher's uncle collected the completed questionnaires from the primary school teachers and returned them to the researcher. Twenty primary schools in Ika and

Aniocha areas of Bendel State were involved.

Method of Analysis

The personal information of the subjects is shown in a following table. The analysis of the data involved computing the mean, and the standard deviation for each of the items. Secondly, the inter-test reliability was assessed using the Pearson Product Moment Correlation to compute the degree of relationship between Items 1 to 9 and Items 27 to 35 for Format A. The same procedure was used for Formats B and C.

Table 2. Correlation Value Table

The Level of Reliability Between Duplicated Items

According to Courtney:

the standards listed below give us a qualitative measure of the meaning of coefficients. These descriptions have been taken from Guilford's text (by permission) and represent and added context in the interpretation of r values.

Correlation Value	Descriptive Meaning
.50 - .70	moderate correlation, substantial relationship
.70 - .90	high correlation, marked relationship

Table 2 (continued) --

Correlation Value	Descriptive Meaning
.90 - 1.00	very high correlation, very dependable relationship

(Courtney, 1984, p. 526)

This qualitative description of correlation values will be used to analyze the paired items in the test. If the correlation of the paired items is below the standard required, it will be rejected outright. The standard required ranges from .50 to 1.00.

Chapter IV

FINDINGS

The purpose of the study was to assess the perceived need for inservice training to improve the teaching of mathematics in primary schools in Bendel State of Nigeria. The variables studied were the following:

1. The need for more knowledge.
2. Curriculum management and development
3. Teaching strategies.
4. Behavior management.
5. Evaluation procedures.
6. Instructional materials
7. Time for inservice training.

The research questions were answered by using data collected from questionnaires. Personal information data from the subjects were analyzed informally. The data for all the questions were analyzed by computing means and standard deviations of the subject responses. The inter-test reliability was assessed using the Pearson Product Moment Correlation to compute the degree of relationship between items 1-9 and items 27-35 for Formats A, B and C respectively.

Personal Information Survey

There were 144 primary school teachers who took part in the study. The personal information of the teachers is presented in

Table 3. The majority of these teachers are grade II certificate holders.

Table 3. Personal Information of the Subjects for
Formats A, B, & C.

Personal Characteristics	Questionnaire Formats			
	A	B	C	Total for Formats A,B&C
Gender:				
1. Male	22	22	23	67
2. Female	26	26	25	77
Educational Qualifications				
1. Grade I Teacher's Certificate	1	4	3	8
2. Grade II Teacher's Certificate	44	31	43	123
3. West African School Certificate and/or General Certificate of Education	3	6	1	10
4. Other Qualifications	0	2	1	3
Teaching Experience				
1. 0 - 3 years	29	22	19	70
2. 4 - 5 years	6	8	10	24
3. 6 - 7 years	5	7	7	19
4. Over 7 years	8	11	12	31

Inter-Test Reliability

The inter-test reliability was assessed, using the Pearson Product Moment Correlation to compute the degree of relationship between the duplicated and the original items in the test.

Table 4. Pearson Product Moment Correlation Table for the Duplicated Items in the Test.

Numbers	Correlation (r)	Descriptive Meaning
1	.80	High correlation, marked relationship
2	.77	High correlation, marked relationship
3	1.00	Very high correlation, very dependable
4	.87	High correlation, very dependable
5	.67	Moderate correlation, substantial relationship
6	1.00	Very high correlation, very dependable
7	1.00	Very high correlation, very dependable
8	1.00	Very high correlation, very dependable
9	1.00	Very high correlation, very dependable
10	.88	High correlation, marked relationship
11	.50	Moderate correlation, substantial relationship
12	.54	Moderate correlation, substantial relationship
13	.71	High correlation, marked relationship
14	.90	Very high correlation, very dependable
15	.68	Moderate correlation, substantial relationship
16	.77	High correlation, marked relationship
17	.70	Moderate correlation, substantial relationship
18	.68	Moderate correlation, substantial relationship
19	.82	High correlation, marked relationships
20	.91	Very high correlation, very dependable
21	.76	High correlation, marked relationship
22	.75	High correlation, marked relationship
23	.95	Very high correlation, very dependable
24	.74	High correlation, marked relationship
25	1.00	Very high correlation, very dependable relationships
26	.50	Moderate correlation, substantial relationships

Note: The item number comes from Format A.

The result showed that the correlation response of the subjects ranged from .50 to 1.00, indicating moderate to very high degrees of relationships between the paired items (see Table 4).

Note: The duplicated items were only used to determine the internal reliability of the questionnaires.

Summary of the Table

Because the three forms were judged to be internally reliable, all future discussions will treat the questionnaires as being single sets of items. The three forms, henceforth, will be discussed as if they were single forms.

The Seven Variables of the Study

The variables are numbered 1 to 7 for easy identification.

The variables are:

1. The need for more knowledge.
2. Curriculum management and development.
3. Teaching strategies.
4. Behavior management.
5. Evaluation procedures.
6. Instructional materials.
7. Time for inservice training.

These variables were selected to help the researcher to know the specific needs for more knowledge, curriculum management, teaching strategies, behavior management, evaluation procedures, instructional materials and time for inservice training, which the primary school teachers are requesting. To refresh the reader's memory, Table 5 shows the answer choice options available to the respondents.

Note: The Formats A, B and C Table (Variables 1 - 7) that con-

tains the mean, the standard deviation, and the average mean is shown in Appendix III.

Table 5. The Qualitative Descriptions of Mean Values Table.

Qualitative Descriptions of Mean Values	This is the five point option for the original items (Descriptive Meaning)	This is the five-point option for the duplicated items (Descriptive Meaning)
1 = 1 - - - - 1.5	Not at all	If you strongly disagree
2 = 1.51 - - 2.5	Very little	If you disagree
3 = 2.51 - - 3.5	Little	If you neither agree nor disagree
4 = 3.51 - - 3.5	Moderately	If you agree
5 = 4.51 - - 5	Extensively	If you strongly agree

Descriptive Statistics Section

Variable One: The Need for More Knowledge

This section shows Table 6: The Need for More Knowledge (Number = 144). The table contains the item number, object of statement and the mean:

Table 6. Variable One: The Need for More Knowledge

Item Number	Object of Statement	Mean
3	think that inservice can help you know more about classroom structure.	<u>3.94</u>

Table 6 (continued) --

Item Number	Object of Statement	Mean
10	see inservice training as an attempt to upgrade the performance of teachers to meet the continuously changing needs and aspirations of students.	<u>3.62</u>
11	need more knowledge to teach prime numbers of your primary school children.	<u>3.55</u>
12	need more knowledge to teach fractions to your primary school children.	<u>3.55</u>
13	need more knowledge to teach ratio and proportion to your primary school children.	<u>3.63</u>
14	need more knowledge to teach percentage to your primary school children.	<u>3.81</u>
15	need more knowledge to teach graphs to your primary school children.	<u>3.81</u>
16	need more knowledge to teach decimals to your primary school children.	<u>3.67</u>
17	need more knowledge to teach elementary geometry to your primary school children.	<u>3.73</u>
18	need more knowledge to teach elementary algebra to your primary school children.	<u>3.45</u>
19	need more knowledge to teach basic accounting to your primary school children.	<u>3.58</u>
21	need more knowledge to teach measurements to your primary school children.	<u>3.65</u>
22	need more knowledge to teach mathematical application to your primary school children.	<u>3.63</u>
26	need more knowledge to teach addition, subtraction, multiplication and division to, your primary school children.	<u>3.62</u>

Note: The item number of each variable comes from format A.

Descriptive Statistics Section

Variable One: The Need for More Knowledge

The subjects were expected to state their needs for training in the area of the need for more knowledge on a five-point option. The option varied from not at all (no training) (1) to extensive training (5). The descriptive statistics (mean) computed are presented in the above table. The results showed that the mean average response of the subjects is between 3.45 and 3.94. This range of responses is moderate. The results of the test showed that the primary school teachers actually expressed the need for more knowledge in the following specific areas: classroom structure, continuously changing needs and aspirations of students, prime numbers, fractions, ratio and proportions, percentage, graphs, decimals, elementary geometry, elementary algebra, basic accounting, measurements, mathematical application, addition, subtraction, multiplication, and division.

It is very interesting to note that the results of the items in the need for more knowledge are consistent with the results of other items in the study.

Summary of Results

The results of this variable (the need for more knowledge) showed that the primary school teachers expressed the need for more information in teaching primary mathematics to their students. The primary school teachers agreed that the math inservice

training will improve their skills in teaching elementary mathematics.

Generally, most of the primary school teachers expressed the need for more knowledge and more elementary inservice training to upgrade their skills in teaching primary math.

Variable Two: Curriculum Management and Development

The subjects were asked to state their needs for training in the area of curriculum management and development.

Table 7. Variable Two: Curriculum Management and Development

Item Number	Object of Statement	Mean
23	think that inservice training can help you develop and plan a mathematics curriculum in a more effective manner	<u>4.30</u>

Note: The Item Number comes from Format A.

The results in Variable Two show that the mean response of the primary school teachers is 4.30. The mean response is moderate, which indicates the request for more information in curriculum management and development. The primary school teachers regard inservice training as a tool which can help them to plan and develop elementary math curriculum. The teachers indicated a higher need for training in the area of curriculum management and development than the other areas of the study.

This variable has the highest mean average compared with the average means of other variables in the study.

Summary of Results

For the variable curriculum management and development, the primary school teachers agreed that math inservice education would help them to plan and develop the elementary math curriculum.

Variable Three: Teaching Strategies

The subjects were asked to assess their needs for training in the area of the teaching strategies on the five-point option.

Table 8. Variable Three: Teaching Strategies

Item Number	Object of Statement	Mean
1	need more information in the area of learning theories so that you can apply them in a more effective manner	<u>3.72</u>
20	need more knowledge on how to conduct cross ability teaching in your mathematics class	<u>3.60</u>
24	need more information in order to know how to make mathematics fun for your primary school children	<u>3.72</u>

Note: The item number of each variable comes from Format A.

The results showed that the mean response of primary school teachers is between 3.60 and 3.88. The results are interpreted to mean the average response of the subjects is moderately interested in inservice help with teaching strategies. Specifically, the

primary school teachers actually expressed the need for more knowledge in the following areas: learning theories, how to conduct cross ability teaching, how to make mathematics fun for their classroom children.

The teachers regard inservice education positively in dealing with the above-mentioned areas.

Summary of Results

The results showed that the primary school teachers requested inservice training in the area of elementary math teaching strategies.

Variable Four: Behavior Management

The primary school teachers were asked to assess their needs for training in the area of behavior management.

Table 9. Variable Four: Behavior Management

Item Numbers	Object of Statement	Mean
2	need more information in the area of behavior management or reducing discipline problems in your class.	<u>3.65</u>
25	think that inservice training can help you know how to help the problem child in mathematics.	<u>3.88</u>

The results show that the average mean response of the teachers is between 3.65 and 3.88. The average mean response of the subjects is moderate. The results of the test indicate that the elementary school teachers want more information in the area of behavior management or reducing discipline problems in their mathematics classes.

Summary of Results

The expressions of needs of primary school teachers in the items of the above variable are similar to the expression of needs of teachers in the items of other variables of the study.

Variable Five: Evaluation Procedures

The subjects were asked to state their needs for training in the area of evaluation procedures on a five-point option.

Table 10. Variable Five: Evaluation Procedures

Item Numbers	Object of Statement	Mean
4	think that inservice training can help you understand how to better evaluate children's mathematics performance	<u>3.62</u>

The results show that the mean response of the subjects is 3.62. The results of test showed that the subjects believe that inservice training can help them better evaluate children's mathe-

matics performance. The mean response of the subjects is moderate.

Summary of Results

The primary school teachers expressed the need for more training in the area of elementary math evaluation procedures.

Variable Six: Instructional Materials

The subjects were asked to state their needs for training in the area of the instructional procedures.

Table 11. Variable Six: Instructional Materials

Item Numbers	Object of Statement	Mean
5	think that inservice training can help you know how to use supplementary mathematics materials in a more effective manner.	<u>3.61</u>
6	think that mathematics inservice training can be taught or conducted through television and films.	<u>3.54</u>

The results show that the mean item response of the subjects is between 3.61 and 3.53. The average response of the subjects of the test showed that the primary school teachers viewed inservice training as necessary to help them know how to use supplementary mathematics materials like TV and films in a more effective manner.

Summary of Results

The results indicated that the primary school teachers wanted more information in the area of supplementary mathematics materials. In addition, they believe TV and film can be used in conducting inservice education.

Variable Seven: Time for Inservice Training

The subjects were asked to state their choice of time for inservice training.

Table 12. Variable 7: Time for Inservice Training

Item Numbers	Object of Statement	Mean
7	like inservice training to take place during the long holidays	<u>4.06</u>
8	like inservice training to take place during the short vacations	<u>2.76</u>
9	like inservice training to take place during the weekends	<u>2.39</u>

The results showed that the mean response of the subjects is between 2.39 and 4.06. The results of the test showed that the subjects liked the inservice training to take place during long holidays, but they were less likely to accept inservice training during the short vacations and weekends.

Summary of Results

The primary school teachers want the inservice training during the long holidays.

Summary of Results of the Entire Study

Descriptive statistics and Pearson Product Moment Correlation were used to analyze the data collected for this study. In the section on the inter-test reliability of the duplicated items, the correlation ranged from .50 to 1.00. Furthermore, the correlations ranged from moderate high and very high. The primary school teachers responses in the inter-test reliability showed that the test is made up of reliable items.

One finding is that the primary school teachers who took part in the study agreed that inservice training would help them to better teach elementary mathematics to their classroom children. The teachers expressed a need for more information in all the areas investigated: need for more knowledge, curriculum management, teaching strategies, behavior management, evaluation procedures, and instructional materials.

It would appear from the results that the primary school teachers who took part in the study agreed that inservice training would help them to know how to teach elementary mathematics to their classroom children in a more effective manner. They accepted that elementary math inservice education will serve as an aid in teaching primary mathematics to their pupils.

Chapter V

IMPLICATIONS AND RECOMMENDATIONS FOR MATHEMATICS
INSERVICE EDUCATION

This chapter presents the implications and recommendations for mathematics inservice training in Bendel State of Nigeria. The results of this study showed that the elementary school teachers expressed a need for training in all the areas investigated. Furthermore, the primary school teachers agreed that mathematics inservice training is a process for improving the standard of each teacher's performance. In light of this, math inservice training should take individual differences into consideration. From the data collected during this study, it was noted that each primary school teacher expressed different needs for elementary mathematics inservice training. In this regard, mathematics inservice education should attempt to address each teacher's problems in teaching primary mathematics.

Some of these primary school teachers received mathematics instruction in their teacher training institutions, while some did not. This conclusion was derived from the teacher's responses to the personal data segment of the questionnaire. Mathematics inservice education should take individual differences into account. The planners of elementary mathematics inservice training programs should recognize that they are not only tools of progress, but also symbols of faith in improving the performance of teachers.

As a matter of fact, if the planners of primary mathematics inservice education neglect this idea, then mathematics inservice education will be less effective. An investigation should be initiated to find means to acquaint primary school teachers with team teaching. This suggestion is stated because some of these primary school teachers are apparently less comfortable teaching some elementary mathematics topics like graphs, algebra, geometry, etc. The majority of the primary school teachers indicated that they needed more information in order to know how to solve problems in algebra, graphs, geometry, ratio and how to teach them to their students.

In recognizing the problems of the primary school teachers, team teaching is necessary. Team teaching will enable the primary school teacher to cooperate and plan elementary mathematics together, particularly in the curriculum and in the interchange of classes. Under team teaching, each primary school teacher can follow the areas in elementary mathematics he or she knows best. Each teacher can be relieved of a mathematics class in which he or she has inadequate background. Furthermore, under the team teaching plan, several teachers cooperate to teach one or more mathematics classes, each performing the duties for which he or she has enough information. Team teaching will help to remove fear in teaching primary mathematics and might also promote discussion and supplementary instruction in small groups. Inservice education should, therefore, encourage team teaching in the hope that the fear of primary mathematics will be minimized.

Basic courses in elementary mathematics should first be taught to the primary school teachers who have no primary mathematics background. The basic courses will help the teachers to understand primary mathematics inservice education better. Generally, mathematics inservice education, if well organized, will help the primary school teachers to become better acquainted with the necessary techniques for aiding their classroom children to learn elementary mathematics in a way that invites success.

Recommendations for Inservice Education

The data in this study should be compared with the past and/or future primary mathematics inservice education data. Such a comparison would help to determine the effects of the perceived need for inservice training to improve the teaching of mathematics in primary schools in Bendel State of Nigeria.

A study should also be carried out to determine whether or not the content of the elementary mathematics inservice training was implemented in the classrooms. Such a study will help to determine what content helped the primary school teachers.

A descriptive study should follow the characteristics of Bendel State primary teachers. Such a study will help to know more about elementary school teachers in the State of Bendel.

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APPENDICES

APPENDIX I

Cover Letter

Dear Colleague:

You are asked to render help in an educational research study. Enclosed is a questionnaire designed to determine the future needs for inservice training to improve the teaching of primary mathematics in Bendel State of Nigeria. You are asked to complete the questions attached.

The information you will provide will be very helpful for future curriculum planning and development in our primary schools. Your assistance and cooperation will be greatly appreciated. Thank you.

Yours sincerely,

Gabe Iloh
c/o Mr. Eddy Okwuokenye
Box 37
Ubulu-Uku
Bendel State
Nigeria West Africa

GI:cag
Encl.

APPENDIX II

Parts I and II for
Formats A, B and C

FORMAT A

PART I

Personal Information

FORMAT A

PART I

Personal Information

This part of the questionnaire is designed to ascertain information about your personal and professional background as a primary school teacher in Bendel State of Nigeria. Please answer the following questions as appropriately as you can by circling the number on each item.

1. What is your gender: 1. Male 2. Female
2. What is your highest educational qualification?
 1. Grade I Teacher's Certificate
 2. Grade II Teacher's Certificate
 3. West Africa School Certificate and/or General Certificate of Education, Ordinary Level
 4. Other (please specify): _____

3. How many years have you taught in primary schools?
 1. 0-3 years
 2. 4-5 years
 3. 6-7 years
 4. over 7 years
 5. Other than primary schools, please specify where and the number of years you have taught:
Where: _____
4. Name of your present school: _____
5. Address of your school: _____

PART II

PART II

This part of the questionnaire is aimed at determining the instructional areas in primary school mathematics in which you may need additional training. Please answer each question by circling the number representing the appropriate response, where you agree:

5 = Extensively
 4 = Moderately
 3 = Little
 2 = Very little
 1 = Not at all

 TO WHAT EXTENT DO YOU:

- | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 1. need more information in the area of learning theories so that you can apply them in a more effective manner? | 5 | 4 | 3 | 2 | 1 |
| 2. need more information in the area of behavior management or reducing discipline problems in your class? | 5 | 4 | 3 | 2 | 1 |
| 3. think that inservice training can help you know more about classroom structure? | 5 | 4 | 3 | 2 | 1 |
| 4. think that inservice training can help you understand how to better evaluate children's mathematics performance? | 5 | 4 | 3 | 2 | 1 |
| 5. think that inservice training can help you know how to use supplementary mathematics materials in a more effective manner? | 5 | 4 | 3 | 2 | 1 |
| 6. think that mathematics inservice training can be taught or conducted through T.V. and films? | 5 | 4 | 3 | 2 | 1 |
| 7. like inservice training to take place during the long holidays? | 5 | 4 | 3 | 2 | 1 |
| 8. like inservice training to take place during the short vacations? | 5 | 4 | 3 | 2 | 1 |
| 9. like inservice training to take place during the weekends? | 5 | 4 | 3 | 2 | 1 |
| 10. see inservice training as an attempt to upgrade the performance of teachers to meet the continuously changing needs and aspirations of students? | 5 | 4 | 3 | 2 | 1 |

 TO WHAT EXTENT DO YOU:

 ↓

- | | | | | | |
|----------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 11. need more knowledge to teach prime numbers to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 12. need more knowledge to teach fractions to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 13. need more knowledge to teach ratio and proportion to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 14. need more knowledge to teach percentage to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 15. need more knowledge to teach graphs to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 16. need more knowledge to teach decimals to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 17. need more knowledge to teach elementary geometry to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 18. need more knowledge to teach elementary algebra to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 19. need more knowledge to teach basic accounting to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 20. need more knowledge on how to conduct cross-ability teaching in your mathematics class? | 5 | 4 | 3 | 2 | 1 |
| 21. need more knowledge to teach measurements to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 22. need more knowledge to teach mathematical application to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 23. think that inservice training can help you develop and plan a mathematics curriculum in a more effective manner? | 5 | 4 | 3 | 2 | 1 |
| 24. need more information in order to know how to make mathematics fun for your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 25. think that inservice training can help you know how to help the problem child on mathematics? | 5 | 4 | 3 | 2 | 1 |
| 26. need more knowledge to teach addition, subtraction, multiplication and division to your primary school children? | 5 | 4 | 3 | 2 | 1 |

PART III

PART III

Please respond to each statement (27-35) by circling the appropriate number, where:

- 5 = If you strongly agree
 4 = If you agree
 3 = If you neither agree nor disagree
 2 = If you disagree
 1 = If you strongly disagree

-
27. I need more information in the area of learning theories so that I can apply them in a more effective manner. 5 4 3 2 1
28. I need more information in the area of reducing discipline problems or behavior management in my class. 5 4 3 2 1
29. I think that inservice training can help me know more about classroom structure. 5 4 3 2 1
30. I think that inservice training can help me understand how to better evaluate children's mathematics performance. 5 4 3 2 1
31. I think that inservice training can help me to know how to use supplementary mathematics materials in a more effective manner. 5 4 3 2 1
32. I think that mathematics inservice training can be taught or conducted through T.V. and films. 5 4 3 2 1
33. I would like inservice training to take place during the long holidays. 5 4 3 2 1
34. I would like inservice training to take place during the short vacations. 5 4 3 2 1
35. I would like inservice training to take place during the weekends. 5 4 3 2 1
36. If you have other concerns about mathematics inservice education for primary school teachers, please state them here:

FORMAT B

PART I

Personal Information

FORMAT B

PART I

Personal Information

This part of the questionnaire is designed to ascertain information about your personal and professional background as a primary school teacher in Bendel State of Nigeria. Please answer the following questions as appropriately as you can by circling the number on each item.

1. What is your gender: 1. Male 2. Female
2. What is your highest educational qualification?
 1. Grade I Teacher's Certificate
 2. Grade II Teacher's Certificate
 3. West Africa School Certificate and/or General Certificate of Education, Ordinary Level
 4. Other (please specify): _____

3. How many years have you taught in primary schools?
 1. 0-3 years
 2. 4-5 years
 3. 6-7 years
 4. over 7 years
 5. Other than primary schools, please specify where and the number of years you have taught.
Where: _____

4. Name of your present school: _____
5. Address of your school: _____

PART II

PART II

The following questions are aimed at determining the instructional areas in primary school mathematics in which you may need additional training. Please answer each question by circling the number representing the appropriate response, where:

- 5 = Extensively
 4 = Moderately
 3 = Little
 2 = Very Little
 1 = Not at all

 TO WHAT EXTENT DO YOU:

- ↓
- | | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 1. see inservice training as an attempt to upgrade the performance of teachers to meet the continuously-changing needs and aspirations of students? | 5 | 4 | 3 | 2 | 1 |
| 2. need more knowledge to teach prime numbers to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 3. need more knowledge to teach fractions to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 4. need more knowledge to teach ratio and proportion to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 5. need more knowledge to teach percentage to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 6. need more knowledge to teach graphs to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 7. need more knowledge to teach decimals to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 8. need more knowledge to teach elementary geometry to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 9. need more knowledge to teach elementary algebra to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 10. need more knowledge to teach basic accounting to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 11. need more knowledge to know how to conduct cross-ability teaching in our mathematics classes? | 5 | 4 | 3 | 2 | 1 |

 TO WHAT EXTENT DO YOU:

- ↓
- | | | | | | |
|-------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 12. need more knowledge to teach measurements to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 13. need more knowledge to teach mathematical application to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 14. think that inservice education can help you develop and plan mathematics curriculum in a more effective manner? | 5 | 4 | 3 | 2 | 1 |
| 15. need more information in order to know how to make the primary school mathematics fun to your class children? | 5 | 4 | 3 | 2 | 1 |
| 16. think that inservice education can help you to know how to help the problem child in mathematics? | 5 | 4 | 3 | 2 | 1 |
| 17. need more knowledge to teach addition, subtraction, multiplication and division to our primary school children? | 5 | 4 | 3 | 2 | 1 |
| 18. need more information in the area of learning theories so that you can apply them in a more effective manner? | 5 | 4 | 3 | 2 | 1 |
| 19. need more information in the area of behavior management or reducing discipline problems in your class? | 5 | 4 | 3 | 2 | 1 |
| 20. think that inservice education can help you to know more about classroom structure? | 5 | 4 | 3 | 2 | 1 |
| 21. think that inservice training can help you to understand how to better evaluate children's mathematics performance? | 5 | 4 | 3 | 2 | 1 |
| 22. think that inservice training can help you to know how to use supplementary mathematics in a more effective manner? | 5 | 4 | 3 | 2 | 1 |
| 23. think that inservice training can be taught or conducted through T.V. and films? | 5 | 4 | 3 | 2 | 1 |
| 24. think that inservice training should take place during the long holidays? | 5 | 4 | 3 | 2 | 1 |
| 25. think that inservice training should take place during the short holidays? | 5 | 4 | 3 | 2 | 1 |

 TO WHAT EXTENT DO YOU:

- ↓
26. think that inservice training should take place 5 4 3 2 1
 during the weekends?
-

PART III

Please respond to each statement (27-35) by circling the appropriate number, where:

- 5 = If you strongly agree
 4 = If you agree
 3 = If you neither agree nor disagree
 2 = If you disagree
 1 = If you strongly disagree
-

27. I see inservice training as an attempt to up- 5 4 3 2 1
 grade the performance of teachers to meet the
 continuously-changing needs and aspirations
 of students.
28. I need more knowledge to teach prime numbers 5 4 3 2 1
 to our primary school children.
29. I need more knowledge to teach fractions to 5 4 3 2 1
 our primary school children.
30. I need more knowledge to teach ratio and 5 4 3 2 1
 proportion to our primary school children.
31. I need more knowledge to teach percentage 5 4 3 2 1
 to our primary school children.
32. I need more knowledge to teach graphs to 5 4 3 2 1
 our primary school children.
33. I need more knowledge to teach decimals to 5 4 3 2 1
 our primary school children.
34. I need more knowledge to teach elementary 5 4 3 2 1
 geometry to our primary school children.
35. I need more knowledge to teach elementary 5 4 3 2 1
 algebra to our primary school children.
36. If you have other concerns about mathematics inservice education
 for primary school teachers, please state them here:

FORMAT C

PART I

Personal Information

FORMAT C

PART I

Personal Information

This part of the questionnaire is designed to ascertain information about your personal and professional background as a primary school teacher in Bendel State of Nigeria. Please answer the following questions as appropriately as you can by circling the number on each item.

1. What is your gender? 1. Male 2. Female
2. What is your highest educational qualification?
 1. Grade I Teacher's Certificate
 2. Grade II Teacher's Certificate
 3. West Africa School Certificate and/or General Certificate of Education, Ordinary Level
 4. Other (please specify): _____
3. How many years have you taught in primary schools?
 1. 0-3 years
 2. 4-5 years
 3. 6-7 years
 4. over 7 years
 5. other than primary schools, please specify where and the number of years you have taught.

Where: _____
4. Name of your present school: _____
5. Address of your present school: _____

PART II

PART II

This part of the questionnaire is aimed at determining the instructional areas in primary school mathematics in which you may need additional training. Please answer each question by circling the number representing the appropriate response, where:

- 5 = Extensively
 4 = Moderately
 3 = Little
 2 = Very little
 1 = Not at all

 TO WHAT EXTENT DO YOU: ↓

- | | | | | | |
|---------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 1. need more knowledge to teach basic accounting to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 2. need more knowledge on how to conduct cross-ability teaching in your mathematics class? | 5 | 4 | 3 | 2 | 1 |
| 3. need more knowledge to teach measurements to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 4. need more knowledge to teach mathematical application to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 5. think that inservice training can help you develop and plan a mathematics curriculum in a more effective manner? | 5 | 4 | 3 | 2 | 1 |
| 6. need more information in order to know how to make mathematics fun to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 7. think that inservice training can help you know how to help the problem child in mathematics? | 5 | 4 | 3 | 2 | 1 |
| 8. need more knowledge to teach addition, subtraction, multiplication and division to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 9. need more information in the area of learning theories so that you can apply them in a more effective manner? | 5 | 4 | 3 | 2 | 1 |
| 10. need more information in the area of behavior management or reducing discipline problems in your class? | 5 | 4 | 3 | 2 | 1 |

 TO WHAT EXTENT DO YOU:

- ↓
- | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| 11. think that inservice training can help you know about classroom structure? | 5 | 4 | 3 | 2 | 1 |
| 12. think that inservice training can help you understand how to better evaluate children's mathematics performance? | 5 | 4 | 3 | 2 | 1 |
| 13. think that inservice training can help you know how to use supplementary mathematics materials in a more effective manner? | 5 | 4 | 3 | 2 | 1 |
| 14. think that mathematics inservice training can be taught or conducted through T.V. and films? | 5 | 4 | 3 | 2 | 1 |
| 15. like inservice training to take place during the the long holidays? | 5 | 4 | 3 | 2 | 1 |
| 16. like inservice training to take place during the short vacations? | 5 | 4 | 3 | 2 | 1 |
| 17. like inservice training to take place during the weekends? | 5 | 4 | 3 | 2 | 1 |
| 18. see inservice training as an attempt to upgrade the performance of teachers to meet the continuously-changing needs and aspirations of students? | 5 | 4 | 3 | 2 | 1 |
| 19. need more knowledge to teach prime numbers to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 20. need more knowledge to teach fractions to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 21. need more knowledge to teach ratio and proportion to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 22. need more knowledge to teach percentage to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 23. need more knowledge to teach graphs to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 24. need more knowledge to teach decimals to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 25. need more knowledge to teach elementary geometry to your primary school children? | 5 | 4 | 3 | 2 | 1 |
| 26. need more knowledge to teach elementary algebra to your primary school children? | 5 | 4 | 3 | 2 | 1 |

PART III

PART III

Please respond to each statement (27-35) by circling the appropriate number, where:

- 5 = If you strongly agree
 4 = If you agree
 3 = If you neither agree nor disagree
 2 = If you disagree
 1 = If you strongly disagree

-
- | | |
|---------------------------------------------------------------------------------------------------------------------------|-----------|
| 27. I need more knowledge to teach basic accounting to our primary school children. | 5 4 3 2 1 |
| 28. I need more knowledge to know how to conduct cross-ability teaching in our mathematics classes. | 5 4 3 2 1 |
| 29. I need more knowledge to teach measurements to our primary school children. | 5 4 3 2 1 |
| 30. I need more knowledge to teach mathematical application to our primary school children. | 5 4 3 2 1 |
| 31. I think that inservice education can help me develop and plan a mathematical curriculum in a more effective manner. | 5 4 3 2 1 |
| 32. I need more information in order to know how to make mathematics fun for my primary school children. | 5 4 3 2 1 |
| 33. I think that inservice training can help me know how to help the problem child in mathematics. | 5 4 3 2 1 |
| 34. I need more knowledge to teach addition, subtraction, multiplication and division to my primary school children. | 5 4 3 2 1 |
| 35. I need more information in the area of learning theories so that I can apply them in a more effective manner. | 5 4 3 2 1 |
| 36. If you have other concerns about mathematics inservice education for primary school teachers, please state them here: | |
-
-
-

APPENDIX III

Formats A, B and C Table

Explanation

FORMATS A, B & C TABLE

The Explanation of the Formats A, B and C Tables.

The formats A, B and C table contains the seven variables in the study:

1. Need for more knowledge.
2. Curriculum management.
3. Teaching strategies.
4. Behavior management.
5. Evaluation procedures.
6. Instructional materials.
7. Time for inservice training.

These variables contain the item numbers, the mean, the standard deviation, and the average mean of Formats A, B & C respectively. Furthermore, the variables contain the duplicated items in the test. The duplicated items are marked for easy identification.

The above variables will enable the researcher to know the specific needs for more knowledge the primary school teachers are seeking.

FORMATS A, B & C TABLE 1

Variable One: Descriptive Statistics for the Need for More Knowledge (N=144)

Format A			Format B			Format C			The Average Mean of
Item Number	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Formats A, B & C
3	3.854	1.148	1	4.333	.975	1	3.646	1.139	3.94
10	4.063	1.040	2	3.417	1.471	3	3.417	1.381	3.62
11	3.917	1.088	3	3.375	1.539	4	3.354	1.360	3.55
12	3.938	1.192	4	3.833	1.155	8	2.875	1.552	3.55
13	3.938	1.080	5	3.792	1.051	11	3.146	1.429	3.63
14	3.813	1.142	6	3.750	1.329	18	3.854	1.052	3.81
15	4.021	1.000	7	4.188	1.045	19	3.229	1.477	3.81
16	3.813	1.003	8	4.000	1.111	20	3.188	1.483	3.67
17	3.896	.881	9	4.188	1.128	21	3.104	1.433	3.73
18	3.875	.914	10	3.417	1.609	22	3.063	1.522	3.45
19	3.958	1.010	12	3.396	1.380	23	3.375	1.347	3.58
21	3.875	1.064	13	3.771	1.189	24	3.292	1.473	3.65
22	4.021	.911	17	3.229	1.462	25	3.646	1.280	3.63
26	3.688	1.323	20	3.458	1.336	26	3.708	1.288	3.62
29*	3.854	1.130	27*	4.250	1.158	27*	3.771	1.356	

Variable One: Descriptive Statistics for the Need for More Knowledge (N=144) - continued -

Format A			Format B			Format C			The Average Mean of Formats A, B & C
Item Number	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	
			28*	3.375	1.424	29*	3.500	1.426	
			29*	3.208	1.383	30*	3.646	1.376	
			30*	3.7089	1.202	34*	3.438	1.446	
			31*	3.896	1.096				
			32*	3.771	1.134				
			33*	4.167	.953				
			34*	4.146	1.148				
			35*	4.083	1.252				

FORMATS A, B & C TABLE 2

Variable Two: Descriptive Statistics in Curriculum Management (N=144)

Format A			Format B			Format C			The Average Mean of
Item Number	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Formats A, B & C
23	4.042	.824	14	4.563	.873	5 31*	4.292 4.042	1.110 1.031	4.30

FORMATS A, B AND C TABLE 3

Variable Three: Descriptive Statistics in Teaching Strategies (N=144)

Format A			Format B			Format C			The Average Mean of
Item Number	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Formats A, B & C
1	4.417	.613	11	3.417	1.269	2	3.333	1.404	3.72
20	3.979	.956	15	3.563	1.270	6	3.271	1.380	3.60
24	3.938	.932	16	3.584	1.185	7	3.604	1.300	3.73
						27*	4.479	.714	
						28*	3.542	1.383	
						32*	3.938	1.156	
						33*	3.875	1.362	
						35*	3.875	1.231	

FORMATS A, B & C TABLE 4

Variable Four: Descriptive Statistics in Behavior Management (N=144)

Format A			Format B			Format C			The Average Mean of
Item Number	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Formats A, B & C
2	3.771	1.292	19	3.688	1.401	10	3.479	1.288	3.65
25	4.083	1.048	18	3.896	1.115	9	3.667	1.173	3.88
24*	3.688	1.240							

FORMATS A, B & C TABLE 5

Variable Five: Descriptive Statistics in Evaluation Procedures (N=144)

Format A			Format B			Format C			The Average Mean of Formats A, B & C
Item Number	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	
4	3.771	1.225	21	3.854	.989	12	3.229	1.259	3.62
30*	4.063								

FORMATS A, B & C TABLE 6

Variable Six: Descriptive Statistics in Instructional Materials (N=144)

Format A			Format B			Format C			The Average Mean of Formats A, B & C
Item Number	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	
5	3.854	1.130	22	3.542	1.320	13	3.438	1.287	3.61
6	3.875	.981	23	3.292	1.304	14	3.438	1.219	3.54
31*	4.083	1.088							
32*	3.583	1.048							

FORMATS A, B AND C TABLE 7

Variable Seven: Descriptive Statistics in the Time for Inservice Training (N=144)

Format A			Format B			Format C			The Average Mean of
Item Number	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Item Numbers	Mean	Standard Deviation	Formats A, B & C
7	4.167	.953	24	4.292	1.110	15	3.708	1.271	4.06
8	2.958	1.336	25	2.625	1.496	16	2.688	1.461	2.76
9	2.563	1.443	26	2.167	1.374	17	2.458	1.414	2.30
33*	4.375	.841							
34*	3.125	1.231							
35*	2.625	1.645							