EFFECTS OF EXPOSURE TO MATHEMATICS-ENGLISH CONCEPTS ON MATHEMATICS PERFORMANCE IN SENIOR SECONDARY II STUDENTS IN ZARIA, KADUNA STATE OF NIGERIA

BY

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A THESIS SUBMITTEDTO THE SCHOOL OF POSTGRADATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTERS DEGREE IN MATHEMATICS SCIENCE EDUCATION AT THE FACULTY OF SCIENCE EDUCATION, AHMADU BELLO UNIVERSITY, ZARIA.

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DECLARATION

I, Salamatu Asabe MOHAMMED declared that this thesis entitled "Effect of Exposure to Mathematics-English-Concepts on Mathematics performance of Senior Secondary 11 students in Zaria Local Government of Kaduna, Nigeria" is my personal research work. It had never been presented anywhere in any either wholly or partially for the purpose of the award of a higher degree in this University or any other institution. All the quotations and sources of information from Published work of others have been duly acknowledged.

Salamatu Asabe MOHAMMED **Date**

CERTIFICATION

This thesis titled "Effects of Exposure to Mathematics-English Concepts on Mathematics performance of SS (II) Students in Zaria, Kaduna State of Nigeria.'' is my personal research work written by me and had been read and approved as meeting the regulations governing the award of Master Degree in Mathematics Education of the Department of Science Education, Faculty of Education, Ahmadu Bello University, Zaria.

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DEDICATION

This thesis is dedicated to my mother Hajiya Ekele and my late father, mallam Ichado Ekele as well as my husband Alhaji Mohammed Nata'ala for the role they played in my Educational pursuits .

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ABSTRACT

This Study investigated Effects of Exposure of Mathematics-English-Concepts on the performance among SSII Students in Zaria Metropolis in Kaduna State". The background of the Study was discussed, Statement of the Problem, the Objectives of the Study was also discussed, three research Questions were raised, the questions are: what is the difference between the mean scores of students who have been exposed to Mathematics-English-concepts and those who have not been exposed to. 2.Could Gender differences affect performance in Mathematics-English-concepts of students who have been exposed to. 3. What is the effect of school type on the Mathematical performance of students who have been exposed to Mathematics-English-concepts and those who have not been exposed to. The hypothesis postulated to be testing at 0.05 are:1. There is no significant difference between the mean scores of students who have been exposed to Mathematics-English-concepts and those who have not been exposed to. 2. There is no significant difference between the mean scores of male and female students who have been exposed to. 3. There is no significant difference between the mean scores of students from Public and Private schools who have been exposed to. Theoretical framework of the Study was discussed and related Literature were reviewed. The population of the Study is 5604 and sample selected is 280 students. Two instruments were developed and the reliability calculated to 0.85. t-test statistics were employed in analyzing the three hypotheses formulated at 0.05 level of significance, one of the major findings was that those students that were exposed to Mathematics-English-concepts performed better than those who were not exposed to. Among the recommendation made by the researcher is that all Mathematics students should be made to take few courses in English Language.

Operational Definitions of Terms

Mathematics-English-Concepts : This referred to the translation of some mathematical symbols and terms often use in the classroom such as greater than >, less than < equal to =, and the use of bracket to signify multiplication (), divisions, linear equations of degree one and quadratic equations of degree two.

Mathematized Language: This is the reverse of Mathematics-English-Concepts in which some words transformed into mathematical symbols.

Concept can be defined as grasping or acquiring the meaning of the object.

Language is not only a tool of communication but also as a tool for reflection and thinking.

Abbreviations and Symbols

ELL----------English-Language-Learner
NCTM--------National Council of Tearchers of Mathematics
SLAMS--------Second Language Approach to Mathematics Skills
MSEB----------Mathematics Science Education Board
AAAS----------American Association for the Advancement of Science
CAL----------Centre for Approval Linuistics
FIPSE----------Fund for the Improvement of Post-Secondary.

iff- - -	If and only if
> - -	greater than
< - - -	less than
= - - -	equal to
( ) - - -	bracket to signify multiplication
∴ - - -	therefore
∵ - - -	because
∀ - - -	for every
∃ - - -	there exist
∈ - - -	belong to
∑ - - - -	sum up

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CHAPTER ONE

THE PROBLEM

1.1 Background

Mathematics has been defined in so many ways. Richard (2006) defined Mathematics as a subject that is concerned with numbers, space, and time. Mathematics has provided and continued to provide, the computational processes, structures for new scientific principles, new machines, calculators, computers, game strategies. Willoughby (2000) highlighted that the role mathematics plays today is significant in our daily Life. It was obvious that man's day to day activities such as buying and selling, social interaction, economic interdependence, political integrity, communication even domestic work like cooking, eating and many more require some mathematical precision. Harbor-Peter (2000) described mathematics as a culture that afforded man the opportunity to know and accessed things and objects within his immediate and remote surrounding. She went further to say that mathematics enabled man to be disciplined and order the pattern of his life. This was true because assessment of one required planning, setting objective, making decisions and taking better steps for a living.

It has become clear that the command of the language brought much profit, and that the results of learning the language far more than justified the investment in time and energy and this has brought about the followings:

1. It enhanced easy access to communication in newspapers, periodicals and books, and the subsequent acquisition of knowledge and information.
2. It was recognized that the mastery of the English languages was indispensable for academic mobility, passing various examinations and earning commendations for 'good mark' in respect of manuscripts, essays and memoranda.
3. For all higher examinations were conducted in the English language either in the European countries or on the continent of Africa itself.
4. The acquisition of the English language was also considered a weapon for social, political and economic emancipation. This was because those who had little exposure to the European language earned little in spite of their investment in time or energy on the field or in the farm. It had been recognized that a substantial achievement gap existed between language-minority students and native speakers of English (August and Hakuta, 1997).

As concur by Briton et. al. (1975) that we used language to think and to learn, to communicate our thoughts besides using it as a tool for reflection as well as a tool for expression. In fact, whether alone or with others, we used oral language to think about and to make sense of what we were doing. Thus, Baroody (1993) suggests that by encouraging children to talk about their ideas is an excellent way for them to discover gaps, inconsistencies or lack of clarity in their thinking. Indeed, it was well documented that communicating mathematics promotes a deeper and more

lasting understanding of the subject. Thus, to improve English language and understanding mathematical concepts, we need to promote communicating mathematics. This means we need to encourage students to speak out and talk about mathematics. Students must be given the opportunity to discuss, to share and to explain mathematical concepts that they were learning. Student must be able to reflect on what they had learnt. They must be asked to present and to display their understanding in various way or forms, such as in writing works as well as orally to the whole class. By presenting their ideas or explaining to their peers, the students would not only understand the mathematical concepts better but this activity also helped to boost up the students confidence in mathematics.

Bernado (2002), opined that language-minority students were less likely to be represented in mathematics-related majors in higher mathematics which affected their career opportunities and lifetime earnings. Mathematics achievement played a significant role in the academic and social stratification of man. Thus, English-language-learner (ELL) student's mathematics achievement should be explored in light of new ways the English-Language- Learner (ELL) students could be guided to improve on the learning of English language.

Under the standards-based reform movement in the late 1980's the National Council of Teachers of Mathematics (NCTM,1989) published curriculum and evaluation standard for school mathematics in (1989), specifying students' mastery of language for easy learning and retention of mathematics. (NCTM,1989) declared that a more problem-solving and higher order thinking-based curriculum should replace arithmetic and isolated facts-based traditional approach.

The 2000 National Council of Teachers of Mathematics standards also conveyed the importance of mathematical literacy, especially students' ability to communicate mathematically, so that they can read, write and discuss mathematics. While this curriculum movement was taking place, various states created new assessment programs that reflected the tenets of NCTM's new curriculum, which emphasize understanding concepts rather than algorithms, critical thinking, problem solving and communicating mathematically.

Also National Council of Mathematics (1995) observed that the strength of Language Based Program Association of the State (LBPAS) lies in asking students to solve real-life problems by applying higher order and critical thinking skill based on conceptual understanding and they should be able to explain, in writing, how they solved the problems.

The need for strong mathematical skills had never been greater. The No Child Left behind Act of 2002 required all states to assess students' mathematics achievement every year from third grade to eight grades, (Olson, 2002). Under The No Child Left behind Act, English-Language-Learner students were lumped together into an accountability system that not only

failed to provide a level playing field, but that puts them at a severe disadvantage. Few suggestions were given as stated below. (1) According to NTCM's standards, mathematics goes beyond that of algorithms and vote calculation; students were taught to reason mathematically and to communicate their reasoning (Madden et al, 1995).

Krussel (1998) views languages as an essential part of the mathematics construct because language (English) is an indispensable tool in mathematics. It comes as surprise that English- Language- Learner (ELL) students were not successful at solving word problems loaded with difficult and unfamiliar vocabulary (Abedi and Loard, 2001. Solano-Flores and Trunbull, 2003). For English- Language- Learner (ELL) students who were just learning English, words such as least common denominator, ratio, or quotient had little meaning to them if not properly presented. In most cases, the concept was new and in addition, words might be used in ways that could be understood. The researcher from her fifteen years of teaching (Mathematics) experience found out that many teachers failed to explain the meanings of mathematical terms involved in the concept that would be taught. It was very necessary at the beginning of every chapter; the mathematical terms had to be explained in detailed that would bring the meaning into reality to students understanding.

Oyetunde (2003) had clearly pointed out that it was already the concerned of educational administrators around the world to improve the quality of education generally (Mathematics inclusive) and how best to teach because there was a general dissatisfaction with the kind of teaching that goes on in the classrooms. Teaching for improved performance in mathematics as a subject of study in schools and colleges should be done in meaningful manner and this conformed to the widely acclaimed standard advocated by the National Council of Teachers of Mathematics (NCTM) where they emphasis acquisition of the skills of problem solving, reasoning, communication and connections among mathematics topics and other subjects (Herrera, 2001).

Language is the expression or communication of thoughts and feelings by means of vocal sounds, and combination of such sounds, to which meaning is attributed to human speech (website's dictionary 1999). Language awareness was very important, because one could develop their sense of writing skills through writing and reading. "Language is the highest and most amazing achievement of the symbolic human mind." Susan (2001)

In order to communicate properly, one must practice language skills, speaking, reading, and writing in that language for mastering. Then and only then would language skills began to flow wonderful, and become a natural part of the person’s daily existence (Herrera, 2001).

Understanding and application of mathematics were increasingly crucial to an individual’s ability to function in society and succeed in the job market. Nevertheless,

students lacking proficiency in English often had been denied access to adequate mathematics education because educators believed that it was necessary to attempting to teach them more than basic computational skills (Korau, 1992).

1.2 Statement of the Problem

Mathematics had been considered a necessary part of general education all over the world. It featured prominently in the school system from primary to secondary levels. In Nigeria, mathematics was a core subject for all pupils going through the education system. Unfortunately, the subject was hated by most students at the secondary school level (Korau, 1992) and for quite sometimes now; there had been public outcry and complaints over student's poor performances at general certificate examination/senior school certificate examinations (GCE/SSCE). Also there were several write ups that probably put the blame of students' poor performance on varieties or factors such as.

i. Is instructional material consisting of textbooks, practice exercise and special devices not the cause of this poor performance? (Nkom, 1999)
ii. Are the learners' negative attitudes towards mathematics not the cause of this poor performance?
iii. Are the teacher's nonchalant attitudes and their boring teaching method not the cause of this poor performance? (Ibrahim 2008, Adetula 2009)
iv. Most importantly, is lack of Mathematics-English-Concepts proficiency among the students and the teachers likewise not the cause of this poor performance?

There was a need to address the problem of language barriers as it affected students' performance. Therefore, the research felt it was necessary to conduct a study on Effect of Exposure to Mathematics-English-Concepts on mathematics performance of Senior Secondary Schools (II) students in Zaria, Kaduna State of Nigeria.

1.3 Objectives of the Study

- The major objective for this study was to investigate effect of exposure to Mathematics-English concepts on mathematics performance among SS II students who had been exposed to Mathematics-English concept and those who had not been exposed. Other objective was to:
- establish whether gender differences could affect performance in mathematics of students who had been exposed to Mathematics English concept and those who had not been so exposed.

1.4 Research Question

The following research questions were formulated to guide the conduct of the study:

i. What is the difference between the mean mathematical performance of students who had been exposed to Mathematics-English concepts and those who had not been so exposed

ii. Could gender differences affect performance in mathematics of students who had been exposed to Mathematics-English concepts?

1.5 Null Hypotheses

The following are the hypotheses formulated for testing at P≤0.05.

HO_1: There is no significant difference between the mean mathematical performance of students who had been exposed to Mathematics-English concepts and those who had not been exposed to.

HO_2: There is no significant difference between the mean mathematical performance of male students who had been exposed to Mathematics-English concept and female students who had been exposed to.

HO_3 There is no significant difference in the mean mathematics performance of students from morning and afternoon session in public schools whose have been exposed to Mathematics-English concept.

1.6 Significance of the Study

The study was to determine the effect of exposure to Mathematics-English-Concepts on Performance of student in Mathematics. Therefore, this study was significant in the sense that:-

- This study unveil the role and effect of exposure to Mathematics-English-Concepts on performance of SS II students and henceforth discourage the use of local language in teaching Mathematics at this level of education.

-The research would also expose the teachers of Mathematics to some student's friendly attitudes and non-boring teaching methods.

-Since the medium of the instruction is English, mathematics cannot be taught without having a good working knowledge of the Mathematics-English-Concepts; therefore the research would go a long way in making the teacher improve their communication skills.

-The research would also be of benefit to other researchers who may want to borrow leave from this study when they go through.

1.7 Scope /delimitation of the Study.

The research covered six (6) classes II of senior secondary schools in Zaria, Kaduna State of Nigeria. The basis for the selection of the schools and class was because of the fact that the SS III students were writing their examination as at the time of the study, while the time frame for the study would not permit any further delay. T-test was used to collect data.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction.

This chapter reviewed literature on the effect of exposure to Mathematics-English-Concepts on mathematics performance of students among SS11 students in

mathematics under the following subheadings:

-2.2 The theoretical frame work of the study

-2.3 The concept of the mathematized language

-2.4 English Language and performance of students in Mathematics- English Concepts

-2.5 Problems of English language in teaching mathematics-English- Concepts

-2.6 Gender differences in mathematics performance

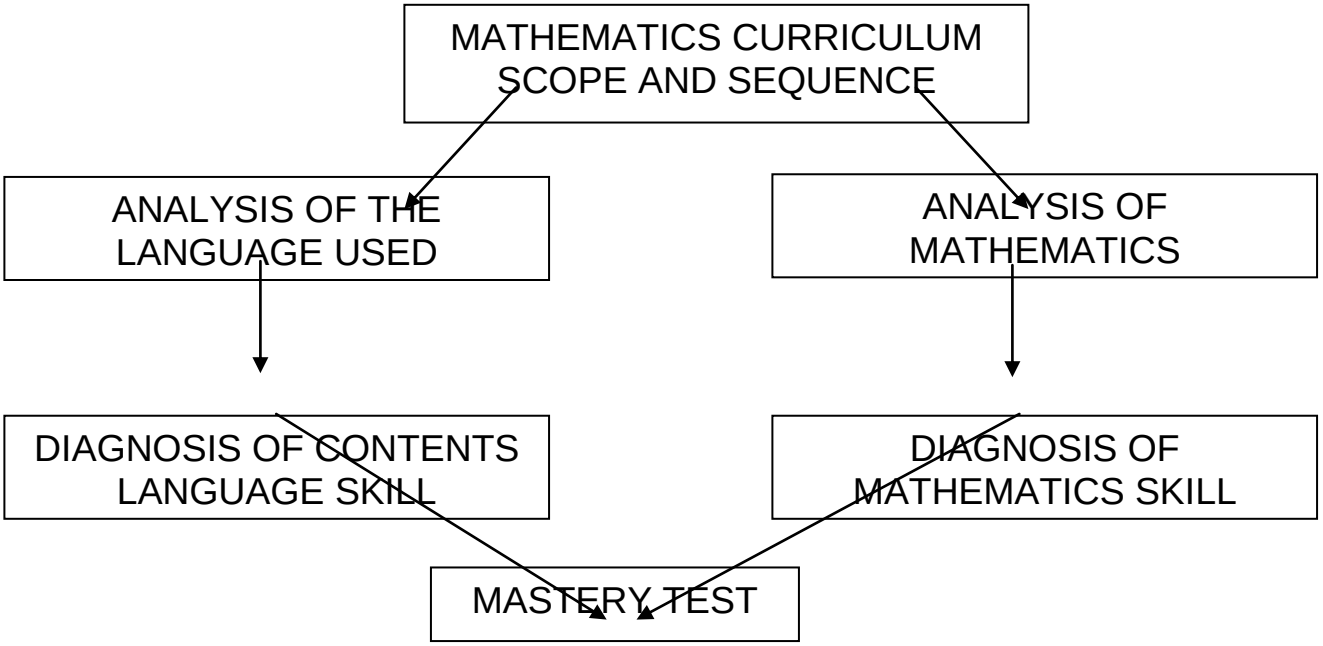
-2.7 Overview of related studies.

-2.8 Implication of the review of the related literature.

2.2 Theoretical Framework

This focus on the theory of the Second Language Approach to Mathematics Skills (SLAMS), follow a diagnostic, prescriptive approach to the teaching of mathematics, in cooperating strategies, for dealing with the language skills of students with a limited, proficiency in English within the context of mastering mathematical] concepts and skills Cueva's (2000). The model has two stands, one focusing on mathematics content and the other on the related language skills.

Showing-model of instruction



Second-Language Approach to Mathematics Skills (SLAMS) Instructional Model. Cuevas (2000) in Bolaji (2007).

The figure was related to the current study as it dealt with students understanding of English language which could also help them in understanding mathematics-English-Concepts. The activities for each strand were based on instructional objectives from the curriculum used by mathematics teacher.

The content in the strand encompasses strategies for analyzing and diagnosing mathematical skill, followed by preventive or prescriptive activities. The language strand followed a parallel path.

First, the language skills required by the instructional objectives were identified. The objective of the content, what does the mathematics teacher needed to pass on to the students and the learner should be taking into consideration. The students need to understand English language, which in turn helped the students to understand mathematics.Abedi and Lord (2001) reported that English-Language-Learner (ELL) student slightly have higher scores on a modified mathematics tests written using simpler language and less complex language structure. They concluded that an English-Language-Learner (ELL) student in mathematics performance was confounded by their Language skills.

Secondly, the mathematics teacher diagnosis the extent to which the students possesses good learning ability and willingness to learn English and mathematics skills. The mathematics teacher diagnoses the students reading ability, understanding of the English

language used. Was the student able to filter out important information in the content? The cognitive ability would help the students to understand the language of mathematics language. English-Language-Learner (ELL) students reading skills affected their mathematical performance (i.e. it is only when they can read that they will be able to interpret. Also ELL student's process information more slowly than do their counter parts because English-Language-Learners (ELL) were slower reader. (Abedi, 2004).

Infact, many studies have demonstrated that English-Language-Learner (ELL) students lack far behind in word problems, and the cause of their struggle in the problem solving aspects of mathematics had been attributed to their less developed academic English proficiency. Abedi, 2004)

In (Lange, 2007) learning difficulties in mathematics were seen as a social construction within the social practice of school mathematics education which was closely related to the social-cultural significant attributed to mathematics in Western societies, the learning or non-learning of mathematics seriously affected children's perceptions of themselves and therefore their construction of identity. Children should be recognized, not just as objects of socialization, but also as actors in their life with their own ways of constructing meaning and interpreting their world (Jamisson,2000).As agents, children were co-constructors of the social practice of social mathematics teaching and learning because of their own sense- making, meaning ascription and identity formation and meaning a unique and valuable source of knowledge on mathematics education and learning difficulties in mathematics (Lange,2007).

Rubenstein and Thompson (2002) emphasized that to be more aware of, and sensitive to, issues of mathematical language acquisition and to be more creative and persistent finding ways to support children's learning, teachers must first understood children's difficulties in making sense of mathematical language" Through a series of example teachers had shared with me in my work as a mathematics educator, I addressed issues raised by the language that teachers used to engage pupils in classroom explorations of mathematical concepts and procedures. The aim was to provide specific illustrations that would encourage teachers to examine more carefully the language they used in the classroom. Examples that reflected common practices and that served to typify the discordant translations between formal mathematical language and natural language. Issues that pertained to language used by teachers to describe mathematical processes, to read and interpret notation, and to define mathematical terms.

Thirdly, the mathematics teacher designed and implemented appropriate preventive language teaching activities. This would help the implementer of the curriculum to implement the appropriate language skill that would be understood by the students. When

this strand was considered, the research agreed with the model if the objectives of the content were identified, problem constituting to understanding of mathematics were also identified, (i.e.) understanding of English language can also help the students to understand mathematics.

The mathematics teachers should try to test the student's cognitive ability to know whether the students could really understand the mathematics question, filter out important information and also be able to carry out the computation.

2.3 English Language and Performance in Mathematics

English language is an official language in Nigeria and it is the medium of instruction in the secondary schools. Competence in English language was an unquestionable asset both for learning and employment. It was fully recognized as such by parents and children. In some subjects particularly mathematics and sciences, English language embodies western thought patterns and there was a risk that translation may lead to fundamental misunderstanding of English- Language- Learner students. Take only a year or 2 to become proficient in controversial English (Hakuta, butler, and Witt 1999). Academic English was necessary for tasks that were context reduced, such as reading chapters in a textbook that described different mathematics functions.

Celadon-pattichis (2003) who used think-aloud to find out how English-Language-Learner (ELL) in grades 6 to 8 approached word problems. They used successful strategies such as reading the problem twice, translating the problem into Simple language, inferring meaning using symbols to understand the mathematics and ignoring irrelevant words.

Problems aroused through interpreting words that student in correctly assumed were homophones (such as many and more, than and then) and misinterpreting mathematical symbols (such as reading 31/2 as thirty-one slash two).

Lakatos (1976) argued against a particular philosophical stance-mathematical formalism-he provides an example of how language was at the heart of mathematical activity. Lakatos' insights were particularly interesting at this juncture because, as Radford (2003) stresses, we were currently living though a paradigm of language: The question was now to grasp the possibilities of discourse and to understand man as homo dialogical. It seemed that the age of Judgment inaugurated by kant arrived to its end and we now enter into the age of communication" (p.124). In the field of mathematics education, this increased awareness of the need to account for the connection between mathematics and language is unmistakable.

Since the 1990s, the number of studies that focus on the language of mathematics had been on the rise. As Cobb and his colleagues (1997) noted: The current movement in mathematics education placed considerable emphasis on the role that classroom discourse could play in supporting students' conceptual development" (p.258).Studies on the role of language in the teaching and learning of mathematics focus primarily on mathematical discourse. Some were

concerned with the development of methodological frame works to analyse mathematics discourse in the classroom (Cobb et al., 1997; Krussel, Spring & Edwards, 2004; Ryve, 2006; Sfard, 2001) while others were concerned with the development of approaches that aim to facilitate the reading and the writing of mathematics (Barwell, Leung, Morgan & Street, 2002; Esty, 1992; Adams, 2003 Usiskin, 1996).

Researchers in mathematics education were in agreement that communication was essential to the learning of mathematics (Ryve,2004).Specifically, from the perspective of mathematics learning, by articulating the principle, concepts and Genevieve Boulet 3 rational behind the steps of a particular problem solution, students had the opportunity to reinforce and deepened their understanding of higher-level knowledge structures in mathematics content"

How Does Language affect the Learning of Mathematics?

Squire and Bryant (2002), Children begin to solve division problems by relying on their mental model of the problem, which was built up from a schema of action that depended on the context" (p.463). In this example, the language describing the steps of the long division algorithm was crytic and impeded meaningful problem solving. Maxwell was not considering the intent of the division problem and was most likely unable to make sense of the answer he obtained. Simple change the way teachers talk in the course of performing a long division problem could make all the difference in a children's understanding. In adopting a language making sense of the mathematics he was learning. If the teacher chose a context, either quotitive or partitive, to perform the long division problem, the steps involved in the algorithm would become comprehensible. Indeed, as Lee (2007) reiterated, traditional algorithms could be meaningfully taught if students have opportunities to engage in conceptually sound activities and to appreciate the meaning of algorithms at the early stage, instead of relying on the mechanical memorization" (p. 48)

The research found out that, in order to solve a word problem, English-Language-Learners (ELL) must be able to understand the language in the problem, interpreted that language so that they could identify the mathematics relation and understood what the problem was asking, and convert the language and the mathematics relation to abstract symbols. All of these were made more simple by the fact that word problems were artificial situation described using the mathematical language of problem solving, which made it easy to use reading skills learned in order to help understand the problem.

2.4 Concept of Mathematized Language

Mathematized language is the system used by Mathematicians to communicate Mathematical ideas among themselves. Mathematics language does not only consist of ordinary English language it also consisted of symbols and highly specialized language .These symbols (+ - × ÷ < >)and specialized language (e.g. hypothenus, triangle, simultaneous equation, e.t.c.) pose a problem to

students' ability to interpret conceptualize mathematical texts (Davidson & Pearce, 1988),especially words problems (Hanley,1978; Earp & tarner, 1980).Thus, mathematical language became the second language challenge to those whose language differs from the medium of instruction, and thus Bell asserted that mathematics vocabulary, special syntactic structures, inferring mathematical meaning, and discourse patterns typical of written text all contributed to the difficulties many (ELL) students had when learning mathematics in English (Bell, 2003;4).

Ron (1999) developed the concept .of "mathematized language", which could help explained why many Ells (English Language Learners) progress English-Language-Learner with the language of mathematics at first but began to deplete towards the tailed end. This theory began with everyday language, which was acquired naturally through social interaction. Mathematized language was similar to everyday language, but made the mathematical concepts that were present in the everyday language explicit. Mathematized language could be used to help build up mathematical language.

Ron (1999) provided an example of how a child used everyday language to talk about wanting to buy a doll but not having enough money to buy. Through natural acquisition with some instruction, the child learned to state this mathematized language, by saying how much money she had and how much money the dolls Costs and asking how much more money she needed. This mathematized language made the translation to the language of mathematics easier. The language of mathematics then allowed the child to verbalize the fact that she had to add some unknown amount to the money she had ($15) to it equals the price of the doll ($22) and finally move to symbolic language.

This topic had emphasized language as it related to the learning of mathematics and the role it played in achievement and assessment. With small amount of research available, it seemed clear that students who spoke other languages at home must attained some proficiency in English language. In order to benefit from mathematical instruction in English language, students who came from where English was the only language spoken would be familiar with many of the linguistic structures to be encountered in the mathematics classroom Brenner, (1998).

> *And structure had to be taught. Unless the linguistics Concept is presented in concrete and dynamic form, the language use by the teacher will only be mystery to the learners. This means that mathematics must not be taught by the teacher writing symbols on the blackboard, re-arranging them, and getting "answer" Asking the class to copy the process and to learn by heart. Instead the teacher must be trained to involve the children in careful structure activities, investigations and discussions, which will measure understanding. The teaching of mathematics in the second language i.e. English language*

The research agreed with the above quotation because for the students to become master of the concept mathematical language, the linguistic concept must be presented in the way that would be understood by the students. For a child to understand any topics taught in mathematics, she/he must be familiar with English language so that his/her interpretation of any problem given would become easy. And structures had to be taught. Unless the linguistic concepts were presented in concrete and dynamic form, the language used by the teacher would only be a mystery to the learners. This means that the teacher writing symbols on the blackboard, rearranging them, and getting "answers" Asking the class to copy the process and to learn by heart must not teach mathematics. Instead the teachers must be trained to involve the children in carefully structured activities, investigations and discussions, which would measure understanding.

2.6 Performance of Students in Mathematics

Factors responsible for low performance of students in mathematics were enormous.

i. The rising numbers of schools and expansion of school enrolment made it difficult for the teachers of mathematics to teach mathematics effectively.
ii. Low proficiency in English language by the students to understand the mathematical terms. (Menyatso, 1996).
iii. Lack of interest on the part of the teachers and students. (Bolaji, 2005).
iv. The attitude of teachers towards mathematics.

i. The poor method of teaching English language at school. (Richard, 1976; Korau, 2002 ;)

Abedi and Lord (2001) reported that "English-Language- Learner students achieved slightly higher scores on a modified mathematical text written using simpler language and less complex language structure". They concluded that English-Language-Learner students' mathematics performance was confounded by their language skills. Also students reading skills affected their mathematics performance.

Abedi, (2004) had demonstrated that English-Language-Learner students Lag far behind in word problems, and the cause of their struggle in the problem-solving aspects of mathematics had been attributed to their less developed academic English proficiency. Student's poor performance at mathematics problem-solving tasks could be as a result of their level of English proficiency which could contribute to their mathematical knowledge.

Pimm (1987), opined that poor performance in mathematics had been blamed on the problem of language. The problem of language was not exclusive to children in developing countries: children from developed countries experienced it too (Menyatso, 1996). The

situation had motivated researchers to study problems that learners had with vocabulary. Their non- native counterparts, however, enter school without learned the language of instruction and this forced them to simultaneously learn the language and content. This made them lag behind their counterparts because Language for learning academic content might require much more time than that needed to learn language for interacting on social level with English speakers (Anstrom, 1997).Anstrom further summarised this sentiment as follows: In mainstream settings, native speakers, for whom English language is nearly automatic, can focus primarily on the cognitive tasks of an assignment-learning new information, procedures,e.t.c.-however, the students with limited ability in English must focus on both cognitive and linguistic tasks-learning new vocabulary, structures and academic discourse" .In most cases the English language learners failed to understand meanings embedded in words used in mathematics (Durkin and Shire, 1991).

In Nigeria, mathematics is a core subject for all pupils going through the education system (National Policy on Education NPE, 2004). Unfortunately, the subject was hated, by most students at the secondary school level (Korau, 1992) and for quite some time now, there have been public outcry and complaints over students' poor performance at general certificate examination/senior school certificate examination (GCE/SSCE). Lassa (1986) observed that there were three schools of thought that hold different but convergent views, which explained the state' of students' poor performance in mathematics at the Senior Secondary School level.

The first view was that the student's low performance in the subject was as a result of the teacher's ineffectiveness and poor attitude to teaching. This had been substantiated by remarks from parents and government official that blamed the teachers for student's poor performance in school.

The second school of thought holds the view that the students were responsible for their own poor performance in public examinations. Those who hold this view believed that students' poor performance in mathematics was as a result of their negative attitude and lack of interest in the subject. They were of the view that such students looked at mathematics as an impossible task and a subject to be avoided at all costs. The teachers' efforts, therefore, was not likely to yield fruitful results (Lassa, Op. Cit).

The third school of thought attributed the students' poor performance in mathematics to the curricular change in the subject. The change from the so-called 'traditional mathematics' to the so-called 'modern mathematics' to the present school mathematics curricular was believed to be the root cause of the crisis of students' poor achievement in mathematics.

The research had confirmed that students' performance in public examination in mathematics had not been impressive. The major problem facing their failure was the

students' lack of English language, which affected their interpretation. The mother tongue is another major cause that affected the students in understanding of English language. (Chief Examiner report).

Great emphasis should be laid on the teaching of English language because mathematics is written in English language and also the teaching is done in English language. When they understood the English language very well, English-Language- Learners could transfer the skill to translate mathematics into the understandable language.

2.7 Problem of English Language in Teaching Mathematics

It was quiet unfortunate that English language teaching does not receive the attention it merits at the different levels. At the lower levels, many of the teachers who taught English were themselves not proficient in the language. English is in a state of confusion at this level as teachers used English and the vernacular according to their ability. At the post-primary level also things were not much better. Any teacher was supposed to be a prospective English teacher. There were instances where you see a teacher who never studies English language teaching English. Even there were cases when the senior students handle English classes for the junior ones.

Teachers had been known to avoid problem areas because they were not capable of teaching them. The students do not attained a functional command of the language. The texts used were not understood by English-Language-Learner and sometimes the examination questions baffled them.

Lack of proficiency in English, where English is the official language, affects performance not only in academic work but also in one's normal occupation. Ndali (1982) had this to say:

"A matter of some concern is the current low performance of our students in the west African school certificate examinations. Teachers of English are particularly disturbed by the poor performance in English language" It is a very timely and pertinent observation".

Odumah (1982) correctly states "appropriateness i.e. communicative competence- of English language use was neglected in our language teaching. Our language pedagogy needed to go beyond the horizons of grammatical analysis of isolated sentences to the relationship between FORM and FUNCTION, emphasizing, for example, what was meant by knowing a language English- Language- Learner enough to be able to use it appropriately in real life situations.

Anstrom (1995:5) thus students experienced challenges brought about by the medium of instruction, and thus to be successful in mathematics achievement, they had to focus on learning the language of instruction first before they could learn mathematics content. These was the imbalance that occurred between English Language Learners and

the native speakers of English Language.

Baroody {1993), presented an exercise designed to increase awareness of the difficulties encountered in learning mathematics in a second language. The students were instructed to solve the following word problem in a language with which they had little or no familiarity and to think about some questions that focus on factors involved in problem solving. The questions were ;

1) What are the language difficulties in this problem?
2) What are some mathematics difficulties in this problem?
3) What are some extra-linguistic features that could cause difficulty in solving this problem?

The students studied the problem and tried to answer the questions. They realized the difficulties word problems may pose for non-native speaking students. An example of English version of the problem that simulated a student's word-for-word attempt at translating it was giving below. Jean and Andre are brothers. Jean is older. The two go to school which is found less than five kilometers from their home. Although there is a difference in age of three years between the two brothers, their grade levels are only two years apart. Jean is in the fourth year. What class is Andre in? The students discover some potential math pitfalls in the wording of the problem. There was extraneous information--- unnecessary numbers (five kilometers, three years) --- and a mixture of cardinal (two, three) and ordinal (fourth) numbers. The students gave the answer as Andre is in the 6^{th} grade at school. After all 4-2=2.Eric said that simply knowing the language of instruction and the required mathematics skills might not be sufficient for solving problems. Cultural issues may be present as well. A teacher must be careful not to assume that all students had the same educational background knowledge. The examples giving above suggested the desirability of instruction that was sensitive to the linguistic and cultural needs of language minority students. From the language educator's point of view, it was obvious that a lack of proficiency in the language of instruction had harmful effects on a student's ability to deal with content-area texts ,word problems, and lectures, Many language educators (e.g. Spanos, Rhodes, Dale and Crandall, 1988) and a growing numbers mathematics and science educators (e.g.Cuevas, 1984, and Mestre, 1981) were providing arguments suggested that the nature of math and science language imposed a heavy burden on all students regardless of the language of instruction. Furthermore, national organizations, such as the National Council of Teachers of Mathematics (NCTM), the Mathematical Science Education Board (MSEB), and the American Association for the Advancement of Science (AAAS) were calling for an approach to education that emphasized communication for all

students, at all school levels.

The MSEB (1989) supported this call for more communication, recommended that teachers engaged students in the construction of mathematical understanding through the use of group work, open discussions, presentations, and verbalization of mathematical ideas (p. 58). The MSEB advocated the use of non-traditional teaching models, such as paired classes, that had one teacher for language arts and one for mathematics and science (p.65). Such statements challenge language and content-were educators to begin working together to educate students for whom Basic English skills or academic language skills were an obstacle to success.

Focus on the Language of Mathematics; In 1984, researchers from the center for Applied Linguistics (CAL) (Crandall, Dare and Rhodes,1984)initiated a project funded by the Fund for the improvement of postsecondary Education (FIPSE).The study involved collaborative research with mathematics educators at several two-year colleges with high language minority enrollments, and led to the development of a set of materials that could be used as a language-focused supplement to beginning algebra classes. The research phase of the project involved group problem-solving activities with language minority and majority students. The evidence proved that the performance of both types of students was severely impeded by a lack of proficiency in the language of mathematics. In sum, there was little articulation between language arts programs and mathematics programs, despite the obvious language deficiencies faced by large numbers of students enrolled in mathematics.

The research found out that the problem stated above were the possible problems that caused student's inability to understand English language properly. Textbooks were written in English language and taught in English language; therefore the government should take the necessary action to stop everybody teaching English language only those were highly qualified should be employed to teach the secondary school students.

2.8 Gender and Mathematics Learning

An interesting but controversial viewpoint by some researchers is that boys have more positive attitudes towards and perform better in mathematics. Nwagu. (1977), says

In 99.9% of all cases, the boys could perform
all cases, the boys could perform better than the
girls in mathematics

This highly controversial statement was subjected to further proof and unless more research findings agree with the above conclusions, the present writer cannot fully agree to the

view express by Nwagu.

Nwagu further stated that "there seems to be consensus that there is male superiority in performance of spatial tasks, evidence at least slightly before at the onset of puberty and continuous into adulthoods."

In Nigeria today it was believed that subjects like mathematics, engineering drawing, physics and the like were for boys and girls. Most girls confess that they offered mathematics as subjects because it was compulsory.

Gallagher,(2005) said a number of dimension pertaining to students' level of self confidence in mathematics ability, the value of mathematics as perceived by them as well as the amount of time students spent doing mathematics homework were explored as possible factors affecting their difference. The boys portrayed higher self-confidence level as perceived by girls. The girls thought that they tend to do well in mathematics and that they understood quickly in learning the subject.

What then were the reasons for greater success among girls? Girls scored higher than boys in terms of enjoyment in mathematics learning, the importance of mathematics in relation to other subjects, university education and employment. Girls seemed to have a better and wider scope of the need to seriously learn mathematics because of the value they placed on it.

Mulins, (2004) said that would it be reasonable to say then that because girls tend to mature earlier than boys in general, they tend to appreciate learning mathematics not just for the sake of it as a subject but in relation to other subjects in schools as well as life after high school and beyond.

Janet (2008), professor of psychology "there isn't gender differences any more in mathematics performance", say Uw-maidison psychology professor Janet Hyde, the studies' leader. So parent and leader needed to revise their thought about this. The Uw-maidison and university of California, Berkeley, researchers report their finding in July 24, 2008 issues of science.

Though, girls took just as many advanced high schools mathematics courses today as boys, and women earn 48% of all mathematics bachelor's degree, the stereotype persisted that girls struggled with mathematics, says Hyde. Not only do many parent and teachers believe this, but scholars also used it to explain the dearth of female mathematicians, engineers and physicist at the higher levels.

For one thing, because it administered only to college-bound seniors, the sat was hardly a random sample of all students. What's' more; greater number of girls took the test now than boys, because more girls were going to college.

The Stanford scientists were still seeking reason for the connection between maturing and intelligent, but some researchers suggested it has to do with lateralization of the brain. As the brain developed the right and the left sides carry on their functions in increasing isolation.

This lateralization seemed to be accompanied by greater mathematical-but poorer verbal aptitude, perhaps why boys who mature on average of two years later than girls do better at mathematics and wore at language. The Stanford results suggested that girls who mature late have more lateralized brains, and hence greater mathematics potential ability, than their early-maturing sisters. By the same reasoning early boys have more verbal skills than late-maturing ones.

The research agreed with the psychologist that they were just aren't gender difference anymore in mathematics performance. In engineering department, in medicine and pharmacy, we had a lot of girls competing with their male counter-part. In faculty of education, those undergoing courses in diploma, we have a lot of girls also i.e. Ahmadu Bello University presently.

2.9 Implications of Literature Review on the Present Study.

Abedi and Lord (2001) reported that English-Language-Learner (ELL) student slightly have higher scores on a modified mathematics tests written using simpler language and less complex language structure. They concluded that English-Language-Learner (ELL) students in mathematics performance were confounded by their Language skills. When this strand is considered, the implication of the model was that if the objectives of the content were identified, problem constituting to understanding of mathematics were also identified, (i.e.) understanding of English language could also helped the students to understand mathematics.

The mathematics teachers should try to test the student's cognitive ability to know whether the students could really understand the mathematics question, filter out important information and also be able to carry out the computation.

Celadon-pattichis (2003) who uses think-aloud to find out how English-Language-Learner (ELL) in grades 6 to 8 approached word problems. They used successful strategies such as reading the problem twice, translating the problem into Simple language, inferring meaning using symbols to understand the mathematics and ignoring irrelevant words.

The implication of this statement was that in order to solve a word problem, English-Language-Learners (ELL) must be able to understand the language in the problem, interpret that language so that they could identify the mathematics relation and understand what the problem was asking, and convert the language and the mathematics relation to abstract symbols. All of these were made more simple by the fact that word problems were artificial situation described using the mathematical language of problem solving, which made it easy to use reading skills learned in order to help understand the problem.

Janet (2008), professor of psychology "there just aren't gender differences any more in mathematics performance", say Uw-maidison psychology professor Janet (2008), the studies' leader. So parent and leader needed to revise their thought about this. The Uw-maidison and

university of California, Berkeley, researchers report their finding in July 24, 2008, issues of science. This study agreed with the psychologist that they were just aren't gender difference anymore in mathematics performance. In engineering department, in medicine and pharmacy, we had a lot of girls competing with their male counter-part. In faculty of education, those undergoing courses in diploma, degree, masters, we have a lot of girls also in A.B.U. presently.

2.10 Public and Private School

Public and Private school mathematics achievement; basically the goal of teaching math's especially at the primary and the level is to prepare pupils to develop critically and creative outlook of confront the challenges of daily life. (Maremikwu, 2008). Thus for the teaching of math's to be meaningful, teaching must exist at the concrete operational level. By the nature of children, the need a large number of variety of educational or instruction resources and good teaching instructions to interact with the children at the primary and junior level like to explore, experiment, create an interact intensively the environment. The use of copious types of instructional resources, disk, hence creates an enabling environment for effective learning and teaching of the subject. Several studies have shown other indices that could affect pupil's math's achievement. Stringfield and teddies (1991) in their study of rural education in the united state proved that classes and school differs in terms of their learning environment and school resources. Okeyesha (2005) in a comparative study of private(public schools in 22 school of eleven public and eleven private schools in Nigerian. found that public school was better equipped than their private counterpart. The location of the school could also influence the academic performance of the pupils (stols. Daramola (1985) showed that pupils in urban schools performed better than their counterpart in the rural schools. The study also showed that the interaction of the treatment and the type of schools are used statistically significant in consideration of pupil's math's achievement. Post hoc analysis reveals that on the average are private schools. Thought with instructional materials and teachings instructions perform significantly better than their counterparts in public schools also, Ehuwa (2005) noted in his research that there are higher math's average scores for a private schools than their counterpart in public schools, it is worth noting that private schools in Nigeria have more effective and efficient supervisory capacity than this public schools, there has been a boom in enrolment into private schools in Nigeria as the public school system appears to have told the politically and economic pressures.

In conclusion mathematics achievement of primary and junior schools pupils significantly depends on the use of instructional aides and good teaching

instructions are used, there is a bond to the discrimination in the math's achievement level of the pupils in terms of the school locations. The usage of instructional aides and teaching instruction have an added advantage on the math's achievement level of the general pupils in private schools located in urban centre in Nigeria. Interaction between types of schools and location of schools help to remove gender bias in math's achievement in primary and junior schools pupil taught with instructional aides and teaching instructions. (Joubert 2010)

2.11 Summary

This chapter discusses the theoretical framework, English language and performance in mathematics, the concept of mathematized language, master English language in learning mathematics, general performance of student in mathematics, problems of English language in teaching mathematics. The schools under study are within Sabon-gari and Zaria local government areas of Kaduna state. Also the research work tries to look at the aspect of word problems involving translation of word problems into numerical expression and numerical expression to word problems, including proportion and variation.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This Study investigated effect of Mathematics-English-Concepts on the Mathematics Performance of Senior Secondary Schools 11 Students in Zaria and Sabon-Gari Local Government in Kaduna State. In the last chapter, literatures relevant to the Study were reviewed. The focus of this chapter was to outline the Methodology to be used in conducting the Study. This chapter therefore, described the research under the following sub-topics

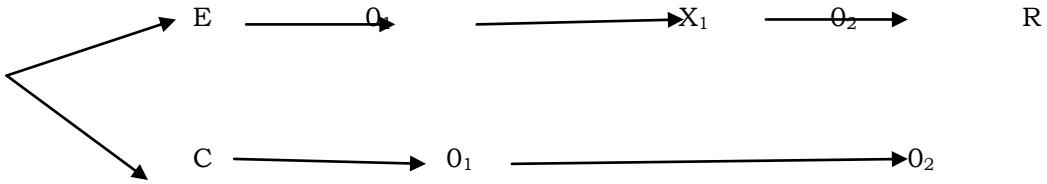
3.2 Research Design,
3.3 Population of the Study,
3.4 Sample and Sampling Procedure
3.5 Instrumentation
3.6 Validity and Reliability of Research Instruments
3.7 Pilot Testing
3.8 Reliability of Instruments
3.9 Administration of Instrument for data collections
3.10 Procedure for Data Analysis
Hypotheses

3.2 Research Design

The research design to be adopted for the study was quasi-experimental design involving pre and post-test. There were two groups: experimental and control group. The experimental and control group would be giving pre-test to determine the equivalent ability level of students of understanding Mathematics-English concept. And later the experimental group would be exposed to the instructional treatment of test of language skill in Mathematics-English Concept instruction. . All the two groups were given posttest. The reason for the choice of Quasi-experimental design was based on the nature of variables and attributes in the study that has two group randomized pretest and posttest design (Nworgu, 1991). The design was further illustrated thus:

(See Appendix A and B)

Figure 3.1 Research Design Illustrate



Where R = Random assignment

E_1 = Experimental Group

C = Control Group

O_2 = Post-Test

O_1 = Pre-Test

X_1 = Treatment

3.3 Population of the Study

The population of the study comprised all the twelve Zones in Kaduna State of Nigeria. But Zaria Zone was sampled out for the study in which only public senior secondary school (II) students of Zaria and Sabon- Gari Local Government Areas of Zaria Zone of Kaduna State were considered. The populations of all the public Schools in the twelve Zones were also indicated in the table 3.1 below. Some of the schools were co-educational while others were single (male or female). The population of the Schools in Sabon-gari and Zaria local government areas covered the total of five thousand six hundred and four (5604). Details of the population were shown in Table 3.2.

Table 3.1 SEC. SCHOOLS AND STUDENTS' POPULATION IN KADUNA STATE

S/NO	NAME OF ZONE	NO. OF DAY SCHOOLS	NO. OF BOARDING SCHOOLS	TOTAL NO. OF SCHOOLS	NO. OF STUDENTS DAY SCHOOLS	NO. OF STUDENTS BOARDING SCHOOLS	TOTAL NO STUDENTS
1	ANCHAU	**62**	**01**	63	24597	500	25097
2	B/GWARI	**20**	**-**	20	6518	-	6518
3	GIWA	**32**	**01**	33	16918	1005	17923
4	KADUNA	**33**	**01**	34	26634	1250	27884
5	KACHIA	**56**	**-**	56	21620	**-**	21620
6	KAFANCHAN	**49**	**-**	49	20475	**-**	20475
7	GODOGODO	**36**	**-**	36	18858	**-**	18858
8	RIGACHIKUN	**30**	**-**	30	19768	**-**	19768
9	S/TASHA	**65**	**-**	65	36760	**-**	36760
10	LERE	**42**	**01**	43	20360	260	20620
11	ZARIA	**41**	**02**	43	34220	480	34700
12	ZONKWA	**44**	**02**	46	13448	144	13592
	TOTAL	**510**	**08**	518	260176	3639	263815

Source: Usman Abubakar Dini, Chief Personel Officer Ministry of Education, Zaria Zone.

Table 3.2 Target Population of the Study

S/N	Schools	Type	Location	Male	Female	Total
1	GGSS D/Bauchi	Single	S/Gari	-	375	375
2	GSS Chindit	Mixed	S/Gari	300	180	480
3	Com.Sec.Sch	Mixed	S/Gari	325	145	470
4	Aminu sec. Sch.	Single	S/Gari	300	-	300
5	GSS T/tukur	Single	Zaria	400		400
6	GSS T/jukun	Mixed	Zaria	152	158	310
7	GSS Muchia	Mixed	S-GARI	320	109	429
8	GSS T/tsebun	Mixed	ZARIA	200	80	280
9	GGSS K/gaya	Single	ZARIA	-	360	360
10	GSS fada	Mixed	ZARIA	248	172	420
11	GSS K/KARAU	Single	ZARIA		400	400
12	GSS KONGO	Single	ZARIA		480	480
13	CHIKAJI	Single	S/GARI	400		400
14	GSS MAGAJIYA	Single	ZARIA	300		300
15	GSS DAKACI	Single	ZARIA	200		200
Total	TOTAL			3145	2459	5604

Source: Zaria Educational Inspectorate Division (2014)

Table 3.1 above showed that there were 5604 senior secondary school students in the two local government areas. With a gender brake down of boys being2745 and girls being 2859.The population of the study is 5604 students in which only 5% would be used for experiment. That is 5% of 5604, which were 280. Afolabi (2001) maintained that a good representation of any given population was hinged on the modality for the selection of the sample. Therefore the choice of the sample size was justifiably based on the procedure for data collection.

3.4 Sample and Sampling Procedure

In this study, only six senior secondary schools (II) would be considered. Afolabi (2001) suggested a proportion sample of 5% or more appropriate for any quasi-experimental research. Using the stratified method of sampling, two co-educational schools were selected because it involved gender differences performance in mathematics and one private school. Thus a total of 280 students would be sampled for the study. All the groups were exposed to the treatment topics.

Table 3.3 Samples selected for the Study

S/N	Schools	Location	Male	Female	Total
1	GGSS D/Bauchi	S/Gari	-	42	42
2	GSS T/jukun	Zaria	31	-	31
3	GSS DAKACHI	Zaria		45	45
4	GSS TUKUR-TUKUR	Zaria	50	-	50

5	COMMER-SEC.SCH.	S/Gari	29	35	64
6	GSS CHINDIT	S/Gari	48	-	48
TOTAL			158	122	280

3.5 Instruments

An instrument and a manual/model was used for data collection, namely; Mathematics Performance Test (MPTI) and Test of Language Skills in Mathematics (TLSM). The test was divided into two sections. Section A contains 50 objective questions and section B contains 10 essay questions. (See Appendix A and B)

3.5.1 Mathematics Performance Test (MPTI) (Pre-test)

Mathematics Performance Test was meant to assess students' mathematics achievement level in the content area of word problem solving, involving proportions, variations, Statistics and Probability. The test was constructed to determine the student that possess Mathematics-English Concept, the score could be cross-sectionally compared within a given class of students i.e. SS (II). All the students in the study would write the test as a pre-test. It consisted of 50 questions in which all the questions carry equal marks. (See Appendix A)

3.5.2 Test of Language Skills in Mathematics –English concept (TLSM)

This was the main instructional method to be used. The researcher would bring along instructional materials such as charts and the lesson modules. The planning of the lesson would include introduction of the topic, the understanding of the meanings, examples of mathematics words translated into symbols and mathematics terms on solving word problems; proportion, probability and variation. Only the experimental groups were exposed to the topics. Mathematics-English-concepts would be used in delivering the lesson.

In the teaching procedure, the lesson would be presented in three steps. First, the introductory discussion, here the researcher explained the concepts of the lesson and later the specific questions asked, the knowledge needed to integrate the information into a coherent representation and the procedure/knowledge needed to make the computation required.

Secondly, the independent work where students would work in a group discussing, justifying and expressing their understanding of each term used. They would be able to give some examples and if possible using mathematical symbols that

would make the word simple to understand. The researcher moved round the class receiving feedback.

Thirdly, it would be the summary where lessons were accomplished by the students as they answer some analytical and synthesizing questions asked by the researcher.

Thus the treatment giving on the experimental group in the unit of problem solving ability, proportion, variation, Statistics, Probability was related to that of Appendix A and B which was attached to the modulus. This was because the students had more ideas on the topic.

3.6 Validity of Instrument

The validity of the instrument was done to improve the quality; the instruments were validated by lecturers in Mathematics Education in the Department of Science Education A.B.U. Zaria who gave useful advice on the improvement of the instrument. Professors and Senior Lecturers in Mathematics Education in A.B.U. Zaria were asked to validate the instruments. After their validation, several items were discarded, some modified and others retained. The lecturers were Professor I.O.Inekwe, Professor C. Bolaji and Dr. Sani Bichi.

Kerlinger, (1973) observed that validation by experts was an effective method for content validity of research instrument.

3.7 Pilot Testing

Two Schools other than those selected for the main study were used for the pilot testing. These are Government Secondary School Chikaji and Government Secondary School Kofar-Doka. The choice of these schools was based on their distance and none interference with the main study schools. The purpose of the pilot study is to determine:

a. The feasibility study of trials
b. The usefulness of instrument used.
c. The appropriate time instruments would be administered.
d. The reliability of the instrument.

3.8 Reliability of Instruments

To test the reliability of the instrument a test re-test approach were applied in which the instruments were administered to a group of student at specific time interval of two weeks as proposed by Tuckman (1975). Also split –Half reliability has been calculated to be 0.85 reliability coefficient correlation.

3.9 Administration of Instrument for Data Collections

The research had two groups; experimental group and the control

group. The experimental groups were exposed on Test of Language Skills in Mathematics (TLSM). The instrument would be administered by the researcher and two other assistants for a period of six weeks. The student would be expected to select from the options provided (by ticking or shading); the achievement test would be scored over 100%. Each question carries 2 marks, and there were 50 items. The research questions would be computed using percentage, frequency mean and standard deviation while the hypothesis were analyzed using variety of statistical tools such as t-test and slip-half reliability coefficient correlation.

3.10 Procedure for Data Analysis

The data collected from this study were analyzed using two statistical methods/classifications viz; descriptive statistics and inferential statistical tools to be used for analyzing them at P≤ 0.05.

The descriptive would be used for answering the research question using frequency distribution, mean, standard deviation and percentage while the inferential aspect would be used in analyzing the hypotheses using t-test since all the hypotheses contain two variables which were made up of parametric data.

Hypotheses

The following are the hypotheses for testing at P≤o.05.

HO_1: There is no significant different between the mathematics performances of students who have been exposed to Mathematics-English concept and those who have not been exposed to.T-test statistics was used to analyze the data.

HO_2: there is no significant different between the mean mathematics performance of male students who have been exposed to Mathematics-English concept and female students who have been exposed to.T-test was used to analyze the data.

CHAPTER FOUR

ANALYSIS, RESULT and DISCUSSION

4.1 Introduction.

In this chapter, the study of Effect on Exposure to Mathematics-English-Concepts on Mathematics performance among SS (II) Students obtained from the instrument (MPT) administered during the pre-test and post-test were presented and analysed. The analysis

essentially involved statistical testing of the hypothesis stated in chapter one. The level of significance adopted was p≤0.05 which formed the basis for retaining or rejecting each of null hypotheses tested. The t-test statistics was used to test all the hypotheses formulated with view to answering the questions raised.

4.2 Analysis and Presentation of Result.

Table 4.1; Performance of the experimental and the control group in pre-test.

There is no significant difference between the mean scores of students exposed to Mathematics – English-Concept performance of SS (II) students in mathematics and those who were not exposed to.

Table 4.1 **results of the Pre-test analyses**.

Groups	N	Mean	SD	Df	$t_{calculated}$	$t_{critical}$	p-value	Decision
Experimental	70	30.46	1.41	138	-0.113	1.96	0.060	Retain H_o
Control	70	30.46	2.85					

4. 3 Null Hypothesis (HO_1): There is no significant difference between the mean score of those who were exposed to Mathematics-English Concepts and those who were not exposed to.

This null hypothesis intends to determine whether performance of experimental and control group would differ when taught Mathematical – English concept.

Table 4.2 Summary of t-Test Analysis for Experimental and Control groups

Groups	N	Mean	SD	Df	$t_{calculated}$	$t_{critical}$	p-value	Decision
Experimental	70	43.97	7.35	138	3.631	1.96	0.000	Reject H_o
Control	70	38.00	11.64					

Significant at p≤0.05

From the Table t- calculated is 3.631 and t-critical from statistical table is 1.96. It is obvious that, t-calculated is greater than t-critical at df 138. The observed significance level of (0.000) is less than 0.05. This implied that there was a significant difference between the mean mathematics performance of students who had been exposed to Mathematics-English concept

and those who had not been so exposed. Therefore the null hypothesis was rejected Ho_1.

Null Hypothesis ($HO_{2)}$: There is no significant difference between the mean score of male and female students who were exposed to Mathematics-English Concepts and those who were not exposed to.

This null hypothesis intended to determine whether performance of male and female subject would differ when taught Mathematical – English concept.

Table 4.3 Summary of t-test analysis for Male and Female

Groups	N	Mean	SD	Df	$t_{calculated}$	$t_{critical}$	p-value	Decision
Male	70	47.13	11.11	138	-0.556	1.96	0.559	Retain H_o
Female	70	48.30	10.68					

The result of the analysis in Table 4.3 showed that, calculated t-value of -0.556 is less than the critical t-value of 1.96 with degree of freedom (df) =138 at p≤0.05. Also p-value .559 which is greater than 0.05. Thus, the Null hypothesis was retained. This means that there is no statistically significant difference between the male and female performance in Mathematics-English concepts.

Null Hypothesis ($HO_{3)}$: There is no significant difference between mean scores of students (II) from Morning and Afternoon Sessions who were exposed to Mathematics-English Concepts and those who were not exposed to.

4.4 Summary of the Major Findings

The major objective of the study was to find out the effect of exposure to mathematics-English –concepts on mathematics performance among SS (II) Students in Zaria Local metropolis of Kaduna State. As a result of the objective, three null hypotheses were formulated and tested. T-test was used to test the three hypotheses. The following findings were arrived at:

i Those Students that were exposed to Mathematics-English-concepts performed significantly better than those who were not exposed to.

ii There is no significant difference in the mean score of male and female students.

iii There is a significant difference in performance in the mean score between the Students from Morning and Afternoon Session.

4.5 Discussion

From the findings of the study, the following discussions were discussed:

HO1: Stated that there is no significant difference between the mean scores of the students who were exposed to Mathematics-English Concepts and those who were not exposed to. From table 4.2, the study showed that students taught with the Mathematics-English concepts had higher mean score than those without it. This indicated that Mathematics-English concepts had a positive effect on Mathematics performance of students. This was in line with Abedi, (2004) have demonstrated that English-Language-Learner Students lag far behind in word problems, and the cause of their struggle in the problem-solving aspects of mathematics had been attributed to their less developed academic English proficiency. Student's poor performance at mathematics problem-solving tasks could be as a result of their level of English proficiency which could contribute to their mathematical-English-concepts.

Pimm (2000), opined that poor performance in mathematics had been blamed on the problem of Language. The problem of Language was not exclusive to children in developing countries alone but children from developed countries also faced the same problem.

Amstrom(2004), further summaried this sentiment as the students with limited ability in mathematics-English-Concepts must focus on both cognitive and Linguistics tasks-learning new academic discourse. In most cases the English Language learners failed to understand meanings embedded in words used in mathematics.

HO2: States that there is no significant difference between the mean scores of Male and Female students who were exposed to Mathematics-English Concepts. From table 4.3, this null hypothesis determined that there was no significant difference between the mean score of Male and Female students who were exposed to Mathematics-English Concepts. This was consistence with Janet (2008), professor of psychology opined that there just aren't gender differences any more in mathematics performance, say Uw-maidison psychology Janets Hyde, the studies leader. So parents and Leader needed to revise their thought about this.

Gallagher (2005),said a number of dimension pertaining to student's level of self confidence in mathematics ability, the value of mathematics as perceived by them as well as the amount of time students spent doing mathematics homework were explored as possible factors affecting their differences. The boys portrayed higher self-confidence level as perceived by

girls.

The research agreed with the psychologist that they were just aren't gender differences anymore in mathematics performance. In engineering department, in medicine and pharmacy, we had a lot of girls competing with their male counter-part. In Faculty of education, those undergoing courses in diploma, we have a lot of girls also i.e. Ahmadu Bello University, presently.

HO3: States that there is no significance difference between the mean scores of student from Morning and Sessions who were exposed to Mathematics-English Concepts and those who were not exposed to. From table 4.4 the study showed that there was significant difference in the mean score performance of students from Morning and Afternoon Session when exposed to Mathematics-English concepts. The result is in line with Daramola (1985), opined that post havoc analysis revealed that on the average students in Afternoon Session taught with instructional materials and teaching instruction perform better significantly better than their counter-parts in Morning Session. Also Eluwa (2005), noted that in his research that there are higher mathematics scores for private schools than their counter-parts in public schools. It is worth noting that Morning Session in Nigeria have more effective and efficient supervisory capacity than Afternoon Session.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The study sought to find out effect of exposure to mathematic-English concept on students performance among senior secondary school (II) in Zaria local government in Kaduna state. Consequently, conclusion and some recommendations were made. Limitation and suggestions were made.

5.2 Summary

This study investigated the effect of exposure to mathematic-English concept on mathematics performance among senior secondary school (II) students in Zaria and Sabon-gari local government in Kaduna State of Nigeria. In the beginning of the first chapter the important position mathematic occupies in primary and secondary school curriculum was highlighted. The state of teaching/learning and poor performance and negative attitude of learners on the subject (especially at the secondary school level) were reported. Reason responsible for poor teaching/learning and student poor performance as stated by the distinguished researchers in mathematics education were documented. Before the chapter ended, objective of the study, research question, null hypothesis, significant of the study and the scope of the study were elaborated.

In the second chapter review of related literature was made of previous work that was relevant to the current study. It began by explaining the theoretical framework on the theory of the second language approach to mathematics which helped to diagnose and gave the prescriptive approach to the teaching of mathematic English concept on mathematics for dealing with the language skill of the student. In the chapter, the concept of mathematical language was elaborated. Talked about English language and performance of student in mathematics-English concept, problems of English language in teaching mathematic, gender differences in mathematic-English concept and finally implication on literature review.

Chapter three described the research methodology of the study. Quasi-experimental design was used to investigate the effect of exposure to mathematic-English concept on

performance among senior secondary school (II) students in mathematic. The population of study was senior secondary school (II) in school located in urban center of Zaria local government in Kaduna state. Their numbers was five thousand six hundred and four that consisted both male and female study, two thousand seven hundred and forty five were male while two thousand eight hundred and fifty nine were female. But only the co-educational schools were considered because of the gender differences that was involved from the population, a sample of two hundred and eighty subjects were selected using purposive sampling technique. Two instruments were used for study which include mathematic performance test (MPT) and test of language skill in mathematic-English concept (TLSM). Both instruments were developed by the researchers. The instrument were validated by expert and sequel to a pilot study carried out on the two. Their reliability co-efficient were calculated (using Pearson product moment correlation coefficient) as r =0.85.The chapters also detailed the procedural for data collection and for analysis after scoring, descriptive statistic and t-test statistic were used after processing data with statistical package for social science (SPSS). In taking decision, whenever the value of Tcal ≤ Tcri H_0 was retained and when Tcal > Tcri H_0 was rejected.

Chapter four detailed how data was analyzed, presented summary of result and discussed the outcome of the study. Research questions were answered using descriptive statistics and hypothesis were tested using t-test statistic at P ≤ 0.05 level of significant. The three research questions and hypothesis determined the effects of exposure to mathematics-English concepts on performance of students in mathematics. Summary of results showed that the effects of exposure to mathematic-English concepts had significant effects on student's performance when compared with the experimental and control groups. There was no significant difference in the mean performance in the male and female students of those who were exposed to effect of Exposure of Mathematics-English concepts and those who were not exposed to.

The last chapter furnished information based on the finding of the study, recommendations, and limitations of the study and suggestion for further studies. The

textbooks used by the students should be simplified so that they can understand the subject matter more easily. Secondly the co-educational schools should be encouraged by the Government to boost the students verbal interaction among themselves.

5.3. Conclusions

Consequently upon the preceding summary, the following conclusions were drawn. From the result, it showed that

Students who have been exposed to Mathematics-English-Concepts performed better than those who have not been exposed to Mathematics-English-Concepts.

The results showed that students from Afternoon Session performed better than students from Morning Session.

The result also shows that there aren't gender differences anymore.

5.4 Recommendations

Based on the findings and conclusions, the researcher would like to make the following recommendations:

i The textbooks used by the students should be simplified so that they can understand the subject matter more easily.

ii There should be some sort of collaboration with the Mathematics – English language Teacher so that the latter could know the type of language the students need for their Mathematics.

Government should introduce lesson system to public schools because when the students have gone home after closing, you can see them hawking so that they don't have time for their studies. But in Afternoon Session even in nursery classes, they stay behind for lessons and that makes the Afternoon Session better than Morning Session.

iii Government should make schooling compulsory for the female students so that they can continue to be stuggling along side with their male counter-part thereby eradicating the notion of boys performing better than girls.

iv More resources for effective teaching such as charts, computers and audio-visual aids should be made available in schools to enhance the application of students-teacher verbal interaction in mathematics performance.

v Co-educational schools where male and female students are taught in the same class

should be encourage rather than having single sex schools because this affect their communication seriously not only in mathematics but in order field too.

vi Mathematics teacher turn-out is very poor so that as they cannot communicate properly, the same way they will translate it to the student i.e lack of language barrier is the note to the students' failure in mathematics.

5.5 limitation of the study

This study had some limitations, some of which include the following;

The study is only limited to senior secondary (II) students in six out of fifteen (15) schools located in urban areas of Zaria and Sabon Gari local government area of Kaduna state. This narrows the scope of generalization of the study

Only two hundred and eighty (280) out of five thousand six hundred and of four students representing 2.2% of the subject's population were involved in the study. It may be that if larger number of subjects were the result may have higher confidence levels.

5.6 suggestions for further studies

The following suggestions were made for further study to expand the scope of this study.

1. The study/research may be conducted on the effects of exposure to mathematics-English concepts on teachers teaching mathematics in secondary schools.
2. Students undergoing mathematics education should be made to take few courses in English language department.
3. It will also be of good interest a research which will focus on the effects of exposure to mathematics-English concepts on performance in other mathematical sciences like (physics). The research will be carried out to find out whether similar or different result could be obtained relative to the current study

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APPENDIX A

LESSON ONE

WORD PROBLEM

Class SS II

Time 40minutes

Subjects Mathematics

Topic Word Problem

Behavioural Objectives:

Definition: word problems can be express as quadratic equation. The equation can then be used as to solve problems.

Difference of a number Means of Subtraction
Product of a number Means of Multiplication
Introduction:

The teacher introduces the lesson by defines the concept of words problems, and explaining how to interpret words into an equation which will then enable the student to solve the problem given using mathematical – English concepts.

Presentation:

Step 1: The teacher solves some examples for the students as follows.

Example 1.Find two numbers whose different is 5 and whose product is 266.

The teacher starts explaining the difficult part of the word problems in order to make it clear for the students.

Two numbers can be any alphabets i.e. a or b

Let the smaller number be x and

Let the larger number be x+5

Hence let their product be $x(x+5) = 266$

$$x^2+5x-266 = 0$$

$\Longrightarrow$ $x^2+5x-266 = 0$

$\Longrightarrow$ $(x-4)(x+19) = 0$

$\Longrightarrow$ $x-14 = 0$ or

$x+19 = 0$

$\Longrightarrow$ $x=14$ or $x = -19$

Find the numbers that can give you 5x when you multiply one number by another

The other number is $14+5$ or $-19+5$

$= 19$ or -14

:- The two numbers are 19 and 14 or -19 and -14

Example 2: The teacher solves another example for the students as follows:

A woman is 4 times older than her child. 5 years ago, the product of their age was 175. Find their present age.

Solution

Let the child's age be x years

Let the mother's age be 4x years

5 years ago, the child's age was (x-5) years and the mother's age was (4x-5) years. The product of their ages was

(x-5)(4x-5)

Hence (x-5)(4x-5) = 175

$\Longrightarrow 4x^2-5x-20x+25 = 175$

$\Longrightarrow 4x^2-25x+25-175 = 0$

$\Longrightarrow 4x^2-25x-150 = 0$

$\Longrightarrow (4x+15)(x-10) = 0$

Either 4x+15 = 0 or

x-10 = 0

4x = -15 and x – 10 = 0

$x = -15/4$ x = 10

$\Longrightarrow 15/4$ is not sensible for an age (because age cannot be negative). Therefore the child's age is 10years while the mother's age will be 40 years.

Step 2: The teachers gives some class work to do as follows

Q1 =

Q2 =

Evaluation: The teacher evaluates the students understanding by asking them some few questions on what has been done and the students were responding very well.

Variation.

LESSON TWO

Class SS II

Time 40minutes

Subjects Mathematics

Topic Variation

Behavioural Objectives:

Definition of variations:-

Direct

Indirect

Joint variation

Introduction: The teacher introduces the lesson by explaining some example by using a real

life situation i.e. when a car is travelling from Zaria to Kaduna,

- When a car moves at 10km for 2 hours, this gives an example of direct variation.
- When a car
- Joint variation

Presentation

Step1: The teacher solves some examples for the students as follows:

If P varies directly as Q and P is 16 when Q is 4, find (a) the relationship between P and Q. (b) the value of P when Q is 8 (c) the value of Q when P is 20.

Solution

P varies directly as Q. it means that as P is increasing, Q is also increasing.

The expression for this statement is.

P α Q

P=KQ where K is a constant of proportionality.

when P is 16

Q is 4

∴ Using the formular

P = KQ

16 = 4k

$K = 16/4$

K = 4

The relationship between p and Q is

P = 4Q

b) The value of P when Q is 8

P = 4Q

P = 4×8

P = 32

c) The value of Q when P is 20

p = 4Q

20 = 4Q

$Q = 20/4 = 5$

Q = 5

Example 2:

The teacher uses the speed time relationship to explain the concept of inverse proportion.

A motorist has to travel from Zaria to Kaduna a distance of 60km/h, how many hours would he need to cover the 60km/p?

A table shows the relationship between speed additions.

Speed(s)h	Time(t)	Product(st).
60	1	60 ×1 = 60
30	2	30 × 2 = 60
10	3	10 × 3 = 30

With similar question it leads the students to fill the chart using discovering method.

Example 3

Partial variations

The total cost of taking a taxi = copy from page 70.

Step II: The teacher gives some class work to the students to do as follows

1. If t α s and t = 30 when s=5, find the value of t when S = 15

Solution

t α s

t = ks where k is constant

t = 30, s = 15

30 = 15k

$K = {}^{30}\!/_{15}$

K = 2

Find t when s = 15

t = ks

t = 2 × 15

t = 30

2. Suppose t varies inversely as s, s varies directly as the square of l and t = 1 when l = 3, find t when l = $1/3$.

Solution t α $\frac{1}{s}l^2$

t = $\frac{kl^2}{s}$

t = $\frac{9}{s}$

l = $\frac{9}{s}$ t = $\frac{9k}{9}$ 9 =9k

s = 9 1 =9 k = 1

Find t when $1\frac{1}{3}$

t = $\frac{kl^2}{s}$

t= $\frac{\left(\frac{1}{3}\right)^2}{9}$

t = $\frac{1/9}{9}$

9t = $\frac{1}{9}$

9^2t =1

t = $\frac{1}{9^2}$

t = $\frac{1}{81}$

STATISTICS

LESSON THREE

Class: SS (II)

Time: 40 Minutes

Subjects: Mathematics

Behavioural Objectives: By the end of the unit of lesson, students should be able to state the meaning of the statistics, discrete data and continuous data.

Introduction: The teacher starts by defining what is statistics. Statistics mean numerical facts, information or series of observation that can be measured or quantified. We have two types o data used in statistics. We have discrete data and continuous data.

Discrete data: the data obtain by counting the numbers of things e.g. the numbers of countries in Africa, numbers of students in your class or school.

Continuous data: these are data obtained by measuring things e.g weight, height, intelligence quotient, student's performance in mathematics

Presentation:

Step I: The teacher solves some example for the students as follows:

Consider the raw marks obtained by 20 students in a true or false mathematics.

The teacher start explaining from the raw mark above you should notice that

i) The data are discrete because they are obtained by mere counting of numbers of items a student got right.

ii) The least score is 2

iii) The height score is 8

From the table above, how did a student who scores 7fares in the test if the pass mark is 5, how many students failed the test. For us to answer this question let us arrange the score in a tabular form, Thus,

Marks	Tally	Frequency
2	11	2
3	111	3
4	111	3
5	111	3
6	1111	4
7	1111	4
8	1	1

The score are arranged in order of size. This is show bya tally work for each occurrence of a particular score. The total number of times a particular score is called its frequency table or frequency distribution table.

Continuous Data or Grouped Data

When a set of data is very large, a frequency distribution table involving class interval is used. In such a case data are classified using appropriate class size depending on how large the items in the date are

Example 2

62	61	65	54	64	55
64	67	64	69	75	79
65	74	75	71	78	59
63	66	82	77	61	58

a) Prepare a frequency table of the weight using a class size of 3 and write down the cumulative frequency table.

b) How many of the recruits are below 72kg solution

c) From the table, 21 recruits are below 72kg.

Class interval	F	wts kg	cf
54-56	2	≤ 56	2
57-59	2	≤ 59	4
60-62	5	≤ 62	9
63-65	6	≤ 65	15
66-68	4	≤ 68	19
69-71	2	≤ 71	21
72-74	1	≤ 74	22
75-77	3	≤ 77	25
78-80	2	≤ 80	27
81-83	1	≤ 83	28
	28		

STEP II: The teacher gives some class work to the student to do as follow;

1. The number below gives the score of student in mathematics class test.

   3 5 1 8 3 6 9 3 6 3

   10 8 3 3 4 7 10 4 7 2

   11 2 2 10 5 8 11 5 5 1

a) Construct a frequency table to represent the data

b) How many students are in a class?

2. The following are marks obtained by student in a remedial mathematics class

   70 45 33 64 50 25

   40 51 47 39 61 53

   48 46 57 53 55 42

   55 26 42 65 58 52

   55 60 18 63 82 65

a) Make a frequency distribution table using a class interval of 5

b) Find the model class

c) Write down the cumulative frequency table.

Evaluation: The teachers evaluate the student by asking those series of question concerning the topic treated above. The students were actually responding positively.

Probability

Behavioral Objectives: By the end of the unit of lesion students should be able to define probability, random experiment, equally outcomes and mutually exclusive outcomes.

Probability of an out come with property A occurring in a random experiment, denoted P(A)

$$P = \frac{\text{Number of outcomes with property outcomes A}}{\text{Total number of outcomes}}$$

$$\text{i.e. } P(A) = \frac{r}{n} \quad \frac{\text{Number of outcomes with property outcomes A}}{\text{Total number of outcomes}}$$

Where n = number equally likely and mutually exclusive outcomes in a simple space.

r = number of outcome which satisfy property say A.

Random Experiment: This is a repetitive process which may result in any of the possible outcomes.

Equally Likely Outcomes: The possible outcome of an experiment are said to be equally likely if each of the outcomes has an equal chance of occurring.

Mutually Exclusive Outcomes: Two outcomes are said to be mutually exclusive when both cannot happen at the same time.

Introduction: The teachers introduce the concept by explaining the meaning of probability we shall use a die to illustrate. When a fair due is thrown, the simple space is {1, 2, 3, 4, 5, 6} and the probability of obtaining a 4 is $\frac{1}{6}$. This is theoretical probability is as exactly 1 throw out of every 6 throws is expected to produce 4. Experimentally when a die is thrown n times, the number of thrown which produces 4 is likely to be approximately equal to $\frac{n}{6}$.

PRESENTATION

Step 1: The teacher solves some examples as follow.

Example 1: An unbiased die is thrown. What is the probability that the number which appears is less than 5?

Simple space={1, 2, 3, 4, 5, 6}

n = 6

r = 4

Because the probability of getting a number less than 5 are {1,2,3,4} = r = 4

Probability = $\frac{r}{n} = \frac{4}{6} = 2/3$

Example 2: A fair coin is tossed twice. Determine the probability of getting a head followed by a tail

Sample space ={HH, HT, TH, TT}

n=4

Favorable outcomes = (HT)

=1

Probability = $\frac{r}{n} = \frac{1}{4}$

Step 2: The teacher gives some class work to do as follows:

Q1 if two fair of coins are tossed, find the probability of getting at least one tail.

Sample space {HH, HT, TH, TT}set of all outcomes.

n = 4

Favorable outcome = set of your outcomes with at least one tail.

r = 3. {HH, HT, TH, TT}

Probability of getting at least one tail $\frac{r}{n}$ = ¾

Q 2: Two perfect dice are thrown together. Find the probability of obtaining a total score of 5

+	1	2	3	4	5	6
1	1+1	2+1	3+1	4+1	5+1	6+1
2	1+2	2+2	3+2	4+2	5+2	6+2
3	1+3	2+3	3+3	3+4	3+5	3+6
4	1+4	2+4	3+4	4+4	4+5	4+6
5	1+5	2+5	3+5	4+5	5+5	6+5
6	1+6	2+6	3+6	4+6	5+6	6+6

The sample space of 36 possible outcome is contained in the above addition table favorable outcomes are (4+1, 3+2, 2+3, 1+4)

r = 4, n = 36,

Probability = $\frac{r}{n} = \frac{4}{36} = \frac{1}{9}$

Evaluation: Only few students tend to understand the last question but then after correction, it will become clear to the students at last.

MATHEMATICS PERFORMANCE TEST SKILLS (MPTS)

INSTRUCTION: ATTEMPT ALL QUESTIONS, EACH HAS FOUR OPTIONS UNDERLINE THE CORRECT OPTION.

1) Three people share 30 eggs in the ratio 1:2:3. How many eggs does the third get?

a) 5 eggs b) 10 eggs c) 15eggs d) 25 eggs e) 12 eggs

2) Musa, Buki and Okon share N1800 so that for every N1 that Musa gets, Buki gets 50k, and for every N2 that Buki gets Okon, gets N3. Find Buki's share.

a) N200 b) N400 c) N300 d) N500

3) N90,000 is divided between Marry, Bob and Yusuf so that Yusuf's share is 3/8 of Bob's nad Bob,s share is twice that of Marry. How much does Yusuf receive?

a) N600 b) N10,000 c)N18,000 d) N5000 e) N7,500

4) Davide 104 into two parts so that one part is 3/5 of the other

a) 39 and 65 b) 30 and 40 c) 100 and 120 d) 65 and 70 e) 20 and 30

5) Five years ago, a mother was twice as old as her son. In 6 years time, the sum of their ages will be 82. Find the mother's present age.

a) 45 years b) 25 years c) 30 years d) 15 years e) 70 years

6) The sum of the digits of a two – digit number is 11. If the digits are interchanged, the number form decreases by 9. Find the number

a) N65 b) 56 c) 45 d) 85 e) 75

7) If x varies directly as y and x = 0.04 when y = 0.024, find the formula connecting x and y.

a) x = 5/3y b) x = 3/5y c) x = 6/5y d) x = 2/5y e) x = 6y

8) Using question number 7, find the value of x when y = 0.7

a) 7/6 b) 6/7 c) 3/7 d) 2/3 e) 0

9) If p varies directly as the square of Q and P = 72 when Q = 6. Find Q when P = 128. a) 6 b) 8 c) 5 d 7

10) If X varies inversely as y and x = 72 when y = 8, find x when y = 30

a) 12 b) 16.5 c) 19.20 d 10.0 e) 15.58

11) A variance T is inversely proportional to P^2 when T = 25, P = 5. What is T when p = 7.

a) 2 b) 1.6 c) 12.76 d) 4 e) 6

12) A α PQ and A = 45 when P = 3, and Q = 15. Find A when P = 6 and Q = 10

a) 50 b) 20 c) 40 d) 180 e) 0

13) The volume (v) of a cone varies directly as the square of the radius (R) of the base and directly as perpendicular height (h). When the volume is $132cm^3$, the radius of the base is 3cm and the perpendicular height is 14cm. Find the height of the cone when the volume is $144cm^3$ and the radius is 6cm.

a) 3.8cm b) 2.3 cm c) 5.6 cm d) 3cm d) 10cm

14) M is partly constant and partly varies as T. When T = 5, M = 7 and when T = 7 = 8. Find

the formula connecting M and T

a) 7½ + ½ T b) ½ + 1/2 T c) 7½ + 1/7 T d) ½ + 1/5T e) 4½

15) Find M when T = 15 from question 14.

a) 16 b) 14 c) 13 d) 12 e) 0

16) The cost of providing accommodation in a hotel is partly constant and partly varies inversely as the number of people, if the cost of providing accommodation for 20 people is N4000 and the cost for 15 people is N3300. Find the cost for 40 people.

a) 5000 b) 5,950 c) 6000 d) 1000 e) 50,000

17) A sack of grain can feed 80 chickens for 18 days. How many days will it last 120 chickens

a) 9 d) 12 c) 13½ d) 22½ e) 27

18) A sum of money is shared between 10 students so that the first get N80, the next gets N105, the next gets N130, and so on. How much does the tenth student get?

a) N280 b) N305 c) 330 d) 200 e) N800

19) A trader buys t tins of milk for n Naira and sells them at M Naira each. What is her profit?

a) M – N b) tm – n c) n – mt d) n/t – m e) m – n/t

20) Simplify 0.0664 X 0.025, expressing the answer in standard form

a) 1.66×10^{-3}

b) 1.66×10^{-4}

c) 1.66×10^{-5}

d) 1.66×10^{-6}

e) 1.66×10^{-7}

Use this question to answer question 21-24.

A bag contains 28 red balls and 8 blue balls. A ball is chosen at random. What is the probability that it is?

21) a red

A) 1/2 B) 2/3 C) 5/6 D) 1/6 E 0)

22) A blue

A) B) C) D) E)

23) Either red or blue

A) B) C) D) E)

Neither red nor blue

A) B) C) D) E)

25) A school contains 357 boys 323 girls. If a student is picked at random, what is the probability that a girl is chosen?

A) B) C) D) E)

26. A is picked at random from a pack of playing cards. Find the probability of picking:

26 the 5 of hearts

A) B) C) D) E)

27. The king of spades

A) 5/52 B) 52 C) 3/26 D) 1/26 E)2/52

28. A black Queen?

A) 1/26 B) 13/18 C) 12/20 D) 12/13 E) 0

29. Either a jack or a 2?

A) 4/26 B) 3/52 C)1/26 D) 3/26 E) 4/13

A girl throws a fair six-sided die. What is the probability that she throws?

30) A 10

A) 0 B) 2/3 C) 5/6 D) 1/6 E)

31) A number greater than 4

A) 6 B) 1/3 C) 1 D) 1/6 E) 1/4

32) An even number

A) ½ B) 1/3 C) ¼ D) 1/5 E) 1/6

33) Find the mode of the following number: 11, 12, 15, 16, 16, 16, 17, and 17.

A) 17 B) 16 C) 15 D) 12 E) 11

34) What is the mean of the above number?

A) 17 B) 16 C) 15 D) 12 E) 11

35) Find the median of above number?

A) 17 B) 16 C) 15 D) 12 E) 11

36) What is range of 15, 20, 30, 10, 6

A) 24 B) 10 C) 6 D) 30 E) 21

37) What is the 10^{th} term of arithmetic progression of -3, 7, 17, . . .

A) 33 B) 37 C) 87 D) 97 E)107

38) 18, -12, 8, ... is a geometric progression. Whose common ratio is

A) -3/2 B) -2/3 C) 4/9 D) 2/3 E) 3/2

39) The first digit of the square root of 79 is

A) 2 B) 4 C) 7 D) 8 E

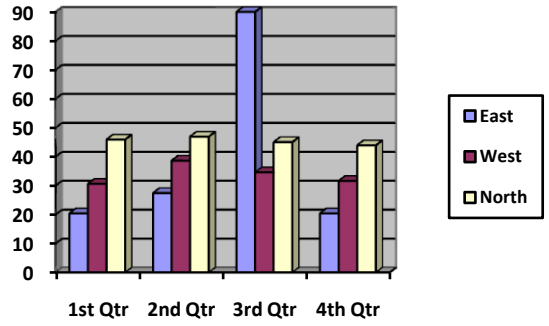
40) Simplify 6/a-3/2b

A) 12b-3a/2ab B) 15b-3a/2ab C) 2ab/12b-3a

41) What is the value of g in 8g-7= 33

A) 5 B) 4 C) 8 D) 10 E) 0.

The graph showing the tax paid on taxable incomes up to N60,000. Use the graph to answer questions 42-45.



42) The tax paid on a taxable income of N32,000.

A) N4100 B) N10,400 C) N6,200 D) N4000 E) N31,000

43) The tax paid on a taxable income of N52,000

A) N6500 B) N7400 C) N5600 D) N4700 E) N740

44) The taxable income of a man who pays N1,600 in taxes

A) N16,000 B) N15,000 C) N10,000 D) 12,000 E) None of above.

45) An American traveler takes USS500 to Nigeria. How many nairas can this be exchange for? (Taking USS1=N110)

A) N55,000 B) N50,000 C) N40,000 D) N500 E) N56,000.

46) How many Leones can be bought for N2000. (taking ₦11 = Le320).

A) Le5800 B) Le32000 C) Le33000 D) Le20000 E) Le22000

47) Each angle in a polygon is 162.How many sides does the polygon have?

A) 20sides B) 16sides C) 15sides D) 10sides E) 12sides.

48) A page in a book is 5cm longer than it's wide. If the area of the page is 414cm, find its length?

A) 20 B) 18 C) 16 D) 15 E) 13

49) Solve the inequality $3x + 16 \leq 0$.

A) $x \leq -8$ B) $x \leq -2y$ C) $x \leq 2$ D) $x \leq 8$ E) $x \leq 28$

50) A certain cuboid measures 8cm by 6cm by 4cm. how many 4cm by 4cm by 4cm cubes would this cuboid Contain?

A) 10 B) 8 C) 6 D) 5 E) 3

APPENDIX B

Test of English Language Skills (TELS)

Instruction: There are ten questions, answer all and each question carry equal marks

1) Find two numbers whose difference is 4 and whose product is 192

Solution:

Let the number be x, x

Let the smaller number be x. then the larger number is x + 4

Their product is x(x+4)

→ x (x + 4) = 192

→ x^2 + 4x = 192

→ x^2 + 4x – 192 = 0

Take the factor of x^2 and 192 which is

(x – 12) (x + 16) = 0

X = 12 or

X = - 16

The other number is 4 more, i.e. 12 = 4 or – 16 + 4 i.e. 16 or – 12

2) A student bought some packets of pens for N2160. If she had paid N24 less for each packet, she could have bought three more packets. How many packets did she buy?

Solutions

Let n be the number of packets bought

Let N x be the cost of a packet of pens

From the first sentence

2160/x = n

From the second sentence

2160/(x – 24) = n + 3 - - - (2)

From (1) x = 2160/n -- - (3)

From (ii) (x – 24) = 2160/n + 3 - - (4)

Subtract (4) from (3)

24 = 2160/n – 2160/(n + 3)

24 (n)(n+3) = 2160 (n + 3) – 2160n

24(n^2 + 3n) = 3 x 2160

n^2 + 3n = 3 x 2160/24

n^2 + 3n – 270 = 0

(n – 15) (n + 18)

N = 15 or n = - 18

3) if x varies directly as y and x = 0.04 when y = 0.024. Find

i) The formula connecting x and y

ii) The value of x when y = 0.7

Solution

i) x ά y

x = k y where k is a constant

Substitute x = 0.04 and y = o.024 in the equation

0.04 = 0.024k

K 0.04/0.024 = 40/24

X = 40/24y

X = 5/3y

When y = 0.7

X = 5/3 0.7 = 7/6

4. If p ά Q and P = 60 when Q = 40. Find

a) The relationship between p and q

b) The value of p when q = 80

Solutions

p ά Q p = 60, Q = 40

p = KQ = 60/40 = 3/2 P = 3/2Q

p = KQ

P = 3/2 x 80

P = 120

5. If x varies inversely as y and x = 72 when y = 8 find

a) x when y = 30

b) y when x = 12

Solutions

x ά 1/y

x = k/y

72 = k/8

K = 72 x 8 = 576

72 = 576/y

Y = 576/30

X = 19.20

6. Make p the subject of the formula in v = 3k

Solutions

Square both sides

$v^2 = 9\ k^2\ p/r$

$r\ v^2 = 9\ k^2\ p$

$p = r\ v^2\ /9\ k^2$

7. Make in the subject of the formula in

P = R

Solution

Square both sides

$p^2 = R^2\ h^2\ k^2$

$h^2 = p^2\ /\ R^2\ k^2$

8. Evaluate $(0.00482)^3$

Number	Log
$(0.00482)^3$	3.830 x 3
0.000000119	7.0490

9. Find the sum of the first 8 terms of the A. P. 4, 8, 12, 16

Solutions

Here n = 8, a = 4 d = 4

Sn = n/2 [2a + (n – 1)d]

S8 = 8/2 [2(4) + (8 – 1) 4]

4[8 + 28]

4(36) = 144

10. Solve x^2 - 7x + 10 = o

Solution: Factorizing the L.H.S.

(x – 2) (x – 5) = 0

x – 2 = 0 or x – 5 = 0

x = 2 or x = 5

11. If 9 people paint a building in 21 days, how long would 7 people take?

Solution:

7 people take more time than 9 people. The number of people is decreased in the ratio 9:7

Time is to be found, so time comes last in each line of working 9 people take 21 days 7 people will take 21 x 9/7 days = 27 days

12. Musa, Buki and Okon share N1800 so that for every N1 that Musa gets, Buki gets 50K and for every N2 that Buki gets, Okon gets N3. find Buki's share.

Solution: Assuming that Musa has 1 share, they Buki gets a ½ share

Okon gets 1½ times much as Buki

Hence Okon's share = ½ x 1½ = ¾

They share the money in the ration of 1:½:¾

= 4 : 2 : 3

4 + 2 + 3 = 9

Buki's share = 2/9 of N1800

= N400

UNIT ONE; WORD PROBLEMS.

OBJECTIVES:

By the end of the lesson, the students should be able to:

- Translate word problems into numerical expression;
- Translate numerical expression into word problems:
- Solve word problems correctly

Content of the unit

Interpretation of word problems into numerical expressions and equation using bracket and fractions.

Background information:

The method adopted in teaching is the text of language skills in mathematics performance. If the students are well trained in their English language which is called English as the second language in Nigeria, students will perform better in mathematics especially in the area that the researcher will put the students through. In written problems, the language should be clear and straight forward. These three topics is going to be taught to only the experimental group for a period of four weeks. The classes involved only SSII of the selected schools in Zaria and Sabon-Gari metropolis of Kaduna state.

The teacher will introduce the lesson by using some examples which is to be discussed through a dialogue in order to expose the students to the lesson.

To introduced the lesson very the teacher is advised to create a teaching dialogue as presented below:

Example 1: find the numbers whose differences is 4 and whose product is 192

T: Let us try to find the two numbers first. Taking the first number to be x, the second to be x + 4.

By this statement the first number is the smaller while the second number is the bigger.

Teacher explains the word product

S: Teacher asks the student to define the word product

T: very good, product means multiplying. To multiply two numbers, what are the numbers from the question asked.

S: The two numbers are x and x + 4

T: Yes, but how do we do that? (the teacher writes expression on the chalk board as x (x + 4).

S: We multiply by expanding the brackets, that is x multiply by x and x multiply by 4

$$x \times x + x \times 4 = x^2 + 4x$$

T: Writes the result as $x^2 + 4x$

T: This result is now equal to what?

S: The result is equal to 192

T: That is $x^2 + 4x = 192$

T: Which type of expression is this?

S: This is a quadratic expression

T: Writes the expression as $x^2 + 4x - 192 = 0$ in the chalk board

Now I want you to think of two numbers that when you take their sums, either by adding or subtracting them we get the middle number and you multiply you get 192.

S: 10 and 6

T: How? explain to the class

S: Because 10 take away 6 is 4 and 10 times 6 is 60

T: NO, that can't be because the product is not giving us 192. Now to find these two numbers we a take the following process(the teacher writes and explain on the chalk board) let's try 12 and 16. If we have

-12+16 = 4

+16-12 = 4

We will now have $(x-12)(x+16)=0$. What the above is telling us is that either

$$(x-12)=0\ or\ (x+16)=0 \quad \rightarrow x-12=0\ \ or\ x+16=0$$

who can say what the values are?

S: The values of $x\ is\ 12\ or\ -16$

T: Good

The teacher now ask the students what can they conclude from what have been solved on the board.

S: From the two numbers we have, x and$x+4$, it means when we take the first number to 12 then the second number will be 16.

T: Very good. There are two necessary conditions that you will bear in mind. You should be able to pick the important information needed in order to form the equation. Secondly, you should be able to find their factors that will enable you to solve the problem.

Activity1

A student bought some packets of pens for ₦2106. If she had paid ₦24 less for each packet, she could have bought three more packets. How many packets did she buy?

let's solve the another example on how to translate a number into words

The teacher write the number as follow on the board.

Translate this numerical number into words

$\frac{1}{2}ofx>15$

T: what does $\frac{1}{2}$ of x mean?

S: One divide by two of x

T: Put it in a better way that will make sense of what you are saying.

S: It reads half of a number x

T: Good, what does the sign > mean in mathematics?
S: It means greater than.
T: Good, who can translate the numerical expression into word expression
S: Half of a number x is greater than 15.
T: Very good.

Activity2
Translate the numerical expressions into word expression
(a)$\frac{1}{3} of\ n\ \leq 7$
(b)24 + 5 > 12 +6

Conditions for a student to be able to translate a word problem into numerical expression requires a number of skills.

1. The student should have the ability to read a comprehension or passage fluently.
2. The student should have the capability of picking out the important information needed in the problem.
3. The student should be able to use the skill he/she acquired in English language to translate the mathematical word problems into numerical expression
4. The student should be able to compute mathematical expressions either word or numerical expression.

UNIT TWO

Objectives:

By the end of this unit the students should be able to:

Distinguish between the direct, inverse and partial variations

Identify any of the variations mentioned above.

When stated in word form, translate any of the variations into symbolic equation form

Recognize variations as relationships between two identified variables.

Contents of the unit

1) Direct variation
2) Inverse variation
3) Partial variation

Materials needed

Variation charts record beckoners

Back ground information

The teacher should treat variations as relationships between two variables. Variations seems to establish or to discover already established relationships between two variables such as cost and quantities of commodities, supply and demand of goods, rate of death, distance and time, salary and production. In fact, mathematics permits all daily life transactions through the concept of variation, just to mention a few.

The teacher can introduce the lesson by using verbal cues and guided discovery charts. The relationship between variation and proportion should be discussed.

To do this the teacher start with an example of teaching by discovery method. Consider the following dialogue between the teacher and her students from the context of the senior secondary school(ii) class, where the students have just learnt the concept of variations.

T: while the students are watching, the teacher develop a discover chart on the chalk board.

Chart on direct variation.

D	t
0	0
1	1
4	2
6	3
8	4

Draw columns and define with d and t as shown. Choose numbers for t and place in the column d the corresponding values as shown. The teacher defines t standing for time and d stands for distance.

The discussion starts as follow:

T: when t=0, d = 0

When t= 1, d = 2

T: who can explain why d = 2 when t = 1
S: it is because d is twice the time
T: good.
T: when d = 4 , t = ?
S: t = 2
T : when t = 4 , what I s d = ?
S: d = 8, this is because d is twice t
If the topic is well understood , students discovers that d = 2t
The teacher can also lead the students to discover the following characteristics about this type of variation involving p and q.

(i) $\frac{p}{Q}$ =K where k is a constant
(ii) As Q increases P will also increase
(iii) As Q decreases P will also decrease

(iv)Another way of writing (i) is P = KQ is a short hand form of writing that P varies directly as Q. i.e

P∞ Q .

Worked examples as follow:

If P varies directly as Q and P is 16 when Q is 4, find (a) the relationship between P and Q (b) the value of P when Q is 8 (c) the value of Q when P is 20

T: as P varies directly as Q. what does that mean?

S: it means that as P is increasing Q is also increasing.

T: good, who can write out the expression for this?

S: $P \propto Q$

T: Good. When you introduce the sign of equality, you introduce a constant. Let the constant be K. We now have $P = KQ$

T: When P = 16, Q = 4. What is the value of K?

S: K = 4.

T: What is the relationship between P and Q?

S: The relationship between P and Q $= K = 4$

$= P = 4(8)$

T: If Q is 8 then $P = 4(Q)$

S: If Q is 8 then $P = 4 \times 8 = 32$

T: if P = 20 then Q = ?

S: $P = KQ$

$20 = 4Q$

$Q = \frac{20}{4}$

$Q = 5$

Activity:

If C varies directly as D when C is 15 and D is 5. Find

(a)the relationship between C and D

(b)the value of C when D is 3

(c)the value of D when C is 20

As the students discover the relationship that exists in the variation, it becomes simpler for them to solve the problems

Inverse variation.

Introduction of inverse variation:

The teacher should use the speed – time relationship to introduce the concept of inverse variation. Present the discovery chart on the chalk board and ask the students to copy and fill the chart, explain with the story. A motorist has to travel from zaria to Kaduna a distance of 60km/h, how many hours would he need to cover the 60km/k?

Speed(s)hm/h	Time(t)	product(st)
60	**1**	**60**
30		
15		
10		
1		

S= speed in km/h , t = time , st= product
Then the dialogue continues:
T: When S= 60km/h, t =1, product st = 60x1 = 60
T: When s= 30km/h, what is time t=?
S: Time t =
T: when s= 15km/h, what is time t=?
S: Time t =
T: when s= 1km/h, what is time t=?
S: Time t =
T: When S is 30km/h, what is the product st?
S:st=
T: When s=10km/h, what is the product or st=?

With similar questions, it leads the students to fill the chart using discovery method.

Partial variation:

The teacher should describe a real life situation that gives an example of partial variation. An example maybe:
The total cost of taking a taxi to the post office to buy stamp is a good example. The cost of taxi is 40k and is constant. One has to pay this 40k whether he succeeds in buying stamp at the post or not. If each stamp cost 50k, then total cost of buying stamps can be tabulated as in the table below. This is a good of a partial variation. Let y be the total cost of going to the post office to buy stamp is partially constant and partially varies with the number of stamps bought.

Table showing partial variation

Number of stamps (x)	0	1	2	3
Total cost: yk	40	90	130	170

From the table, we know that when $x$is 1, y is 90 and when x is 2, $y = 130$. With this information we can find;

a) The relationship between y and x
b) The total cost of 10 stamps
c) The number of stamps bought if total cost is ₦60.

Solution

Since$y$ is partly constant we can write $y = c$ ---------- (1)
where c is a constant.
Also y varies directly as the number of x of stamps bought.
i.e $y = kx$ ----------(2)
where kk is another constant.
Combining (1) and (2) into one equation, we have the equation of partial variation as:

$y = kx + x$

Where k and c are constants. We need two equations to be able to find the values of k and c.
Then $x = 1, y = 90$
$90 = 1k + c$ --------1 c----------(i)
Again $x = 2, y = 130$
$130 = 2k + c$ ----------(ii)
Subtracting (i) from (ii) it gives k=30
Substituting in (i) we have
$90 = 40 + c$
$c = 50$

Therefore,

a) The relationship between y and x is $y = 40x + 50$

b) Total cost of 10 stamps is

$x = (40 \times 50) + 50\ kobo$

$(2000 + 50) kobo$

$2050\ kobo$

₦ 20 .50 K

Then the teacher interacts with the students as follow:

T: when x =1, y= 90 what is the value of c ?

T: when x =2 , y= ?

UNIT THREE

OBJECTIVES: By the end of this lesson, students should be able to divide a quantity into two or more parts which are in the form of ratio.

CONTENT OF THE UNIT:

Proportion.

Background information

The teacher should see and treat proportion as expressing one quantity to another. Proportion involves dividing a quantity into a number of equal shares then distributing the shares in a given ration. For example, if a sum of money is to be divided in the ratio 3: 8: 13:, then it will be divided into 24 shares, (3 + 8 + 13), the distributed in 3 shares, 8 shares and 13 shares. For the concept of proportion to be well understood, the concept of learning in unit (i) must be taking into consideration.

The teacher starts with some examples which are to be discussed along with the students. x, , and z shares N80 so that for every N1 that x gets N3 and for every N2 that y gets, z gets N3, find y's share.

Solution:

If x has one share, then y has three shares, z gets 11/2 times as much as y. Hence z gets 41/2 shares. They receive money in the ratio 1:3: 9/2 = 2:6:9 that is 2 + 6 +9 = 17, that is a unit ratio is 1/17 of ₦85

= 85/17 = ₦ 5

Since y gets 6/17

5 x 6 = N30

Y's share is N30

Another example is Ado, Ben and Kola are of age, 12, 14 and 20 respectively. They share N690 in the ratio of their ages. How much does each get?

From the questions above,

T: What is the total number of their ratio?

S: The total ratio will be the sum of their ages, which is 12 + 14 + 16 = 46

T: Ado's age is 12

S: Ben's age is 14

T: Kola's age is 20

S: Ado got: 12/46 x N690 = N180

T: How much did Ben get?

S: Ben got N210 i.e. 14/46 X N690

T: How much did Kola get?

S: Kola Got 20/60 X N690

T: when add up the sum that each got, what is the total amount?

S: When you add up the entire amount which every one of them gets as N180 + N 210 +

N300, you have N 690

T: very good

Activity 1:

Divide N117 between Bola and Rabi so that their share is in ht ration 8: 5. Students should be given a lot of exercises to practice on proportion so that their knowledge on that area will be widen

UNIT FOUR

Objectives. By the end of the lesson, students should be able to find the probability of any number giving to them.

Content of the Unit:

Probability.

Background information.

Definitions; Probability is a measure of the likelihood of an event happing. Experimental probability uses experimental data to predict future events. Theoretical probability considers the physical nature of a situation to give an exact value for a probability.

- if there are n possible outcomes and r required outcomes, the probability, of obtaining a required outcome is giving as a fraction.

P = number of required outcomes divide by number of possible outcomes, symbolically r/n where P lies between 0 and 1. P may be a common fraction, a decimal fraction or a percentage.

If an event is certain to happen, its probability is 1. If an event is certain not to happen, its probability is 0.

If the probability of an event happening is P, then the probability of an event not happening is 1-P.

The writes the question on the board and interact with the students. A fair six-sided die is thrown. Find the probability of getting (a) 3, (b) a 4 (c) a 9 (d) either 1, 2 or 3.(e) a number divisible by 3 (f) a number less than 5.

T: The probability of getting a 3 is 3/6 = ½

T : The probability of getting a 4 is

S: 2/3

T : Very good.

T : The probability of getting a 9 is

S : 9/6

T : No

S : 0 because there is no 9 on dice.

T ; Very good.

T : What is the probability of getting either 1,2,3 ?

S : 1/2

T : Why ?

S : Because we have three numbers ie 1, 2, 3 = 3/6 =1/2.

T ; What is the probability of getting a number divisible by 3

S : 1/3

T : Why ?

S : Because the numbers divisible by 3 is only 3 and 6.

T : Very good.

T : What is the probability of getting a number less than 5

S : 1

T : No

S : 5/6

T : NO

S ; 2/3

T : Yes, Very, Good.

T ; The teacher says why did we get 2/3 ?

S ; We have 2/3 because we have 4/6 gives 2/3.

T : Excellent.

Activity 1

If F = (2, 3, 7) and T = (10, 20, 30, 40).

A) If one element is selected at random from F, write down the probability that it is odd.

F=2/3

B) If one element is selected at random from T, write down the probability that it is a multiple of 5.

C) If one of the element is selected at random from FUT, write down the probability that it is either a prime factor of 42 or a multiple of 4. =5/7

Activity 2

Calculate the mean of each set of numbers.

a) 24, 12, 14, 18

b) 0,7,4,5

c) 4,10,0,5,8,0

d) 10,11,12,13,15,17

T :Who can tell me the mean of question a?

S :The mean of the numbers is 17

T Very good

T :What is the mean of question b

S :The mean is 4

T :Very good

T :What is the mean of question c

S :The mean of the numbers is 4.5

T :Good

T :what is the mean of question d

S The mean of the numbers is 13

T : Good.

Activity 3

The teacher gives class activity to the students to do as follow:

Calculate the mean of each set of numbers.

a) 14,16,3 b) 11,12,16, c) 0,6,6,7 d)8,8,4,3,12

Activity 4

The teacher gives another classwork to the students to as follow:

Find the mode, median and mean of each set of numbers.

a) 7,7,9,12,15

b) 4,8,11,11,12,12,12

c) 1,0,15,0,8,12

d) 9,8,6,9,6,5,7,9,7,8,9,7.