

**SURVEY ON CHALLENGES AND QUALITIES OF A GOOD
MATHEMATICS TEACHER IN SOME SELECTED SECONDARY
SCHOOLS IN BOSSO LOCAL GOVERNMENT AREA OF NIGER STATE.**

BY

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ABSTRACT

The aim of the study is to identify the Challenges and Qualities of a good mathematics teacher in some selected secondary schools in Bosso local government area of Niger State, Nigeria. In order to obtain the pertinent information of the study, four research questions were formulated. Survey research designed was adopted with the administration of hundred (200) questionnaire to the mathematics teachers and students of the selected Secondary School in Bosso LGEA of Niger State. The findings of the study revealed that various environment factors that influence academic performance of student among these are, the setting of the school, the student closeness to the school, learning facilities negatively and so on. The study stressed the high extent of these factor on the academic performance of student in Mathematics. The findings of the study also revealed strategies such as setting a well-structured curriculum to improve the teaching and learning of Mathematics in Secondary School, more qualified Mathematics teacher should be employed, standard instructional materials should be made available for teachers to improve the teaching of Mathematics among others. The research here by recommend the that students should be enlightened on the important of Mathematics in their career, seminars/workshops should be organized for the teacher on teaching mathematics and how to enhance student interest in learning Mathematics, the ministry of education should look in to the school curriculum in order to improve the standard of teaching and learning mathematics in secondary schools and also the government should provide adequate infrastructure that will enhance teaching and learning mathematics in secondary schools.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

It is widely believed that mathematics is very important to the economic, political and scientific development of any country. It is because of this common phenomenon that made every country in the world to make mathematics a compulsory subject in every aspect of educational system. The principles of mathematics are generally understood at an early age. When missed, it gives birth to anxiety which includes a feeling of tension, apprehension or fear that has to do with mathematics performance. Mathematics anxiety is a phenomenon that cuts across some students in secondary schools because they tend to miss its principles. The idea of good Mathematics teacher for each individual is variable. Students' perception, opinions and/or experiences about a good Mathematics teacher are different. According to Salman (2010), mathematics is a subject that makes it possible for a learner to have adequate assimilation and interpretation of concepts in science and technology. Mathematics is referred to as the bedrock of science, which results in technology (Ochepa, 2011). The mathematics education of the general public is a priority of our educational system beyond the education of future mathematicians and scientists. According to Ochepa (2010) we need a system of mathematics education that seeks to recognize the mathematical needs of average citizens and is designed to ensure that those needs are met. However, Ochepa also added that a good teacher is always in a constant learning process due to changes in terms of the students' characteristics, the curriculum, the community, and finance among many others. The primary purpose of teaching at any level of education is to bring a fundamental transformation in the learners (Tebabal & Kahssay, 2011). To ease the process of knowledge transmission, teachers should employ appropriate teaching methods that best suits the

specific objectives. A good teacher also has a psychological influence on the students, having a strong influence on their achievement. According to Ayeni (2011), teaching is a process that implies accomplishing desirable changes in learners in order to obtain specific result. For the method used for teaching to be effective, Adunola (2011) maintained that teachers need to be familiar with many teaching methods that take into account the magnitude of complexity of the concepts to be taught. The good teacher is the one who has clear objectives and own goals of teaching. A teacher can provide the students with the correct answer to a question, which can be effective only if the main objective is mainly to compare and analyze different results. However, if the objective is to make the student think about the option of providing different possible answers, the teacher, in this case, may be regarded as ineffective. A good mathematics teachers need to focus on students' achievement. Quite remarkably, regular poor academic achievement by the majority students is fundamentally linked to use of ineffective teaching methods by teachers to impact knowledge to learners (Adunola,2011). Another factor is that good teachers should provide the students with activities and assessment that encourages them to learn (and learn through experience), as well as having an engaged feedback. Finally, to create a warm environment and a relationship with the students in which respect will enhance learning. The responsibilities of good teachers are to have lesson clarity, instructional variety, and teacher task orientation, engagement in the learning process and student success rate. Therefore, good mathematics teachers do not teach in front of the class doing a good demonstration on the extensive and deep content knowledge, they teach to promote and enhance learning. Besides, they know how to manage, not only their knowledge, but also the classroom and the students in terms of discipline, work, interaction between teacher- students-students, how to give instructions, and how to assess and evaluate activities, the students and their own work. Therefore, to be a good mathematics

teacher also implies to have a series of qualities, in terms of professional and personal skills. The essence of this study will be of importance in examining the challenges and qualities of a good mathematics teacher in some selected secondary school. This research will explore whether there was a relationship between mathematics teacher and students. In addition, to explore factors that influences the understanding of good mathematics teaching. This study looked at where to attribute the elements of good mathematics teaching: to some personality trait, to teacher's classroom behavior, to teachers' mathematical knowledge or to teacher education programs.

1.2 Statement of the Research Problem

Good Mathematics teachers are distinguished by their dedication to the students and to the job of teaching, and feel responsible for the achievement and success of the students and own professional development. Good Mathematics teachers really believe that all students can learn Mathematics, although all learn differently. They strive to motivate and engage all their students in learning rather than simple accepting that some students cannot be engaged and are destined to do poorly. There are many different types of Mathematics teachers. For instance, among many others, there are those who walk into the classroom, and some students do not even notice them; also there are some who seem to be authentic dictators, and students are even afraid to ask anything in the classroom. There are those who read from a book, or talk constantly, during the whole session, while students keep just copying; or even those who just talk, and by the end of the lesson, students do not even know what the lesson was about, because the objectives, structure and/or theme were not clear, even for the teacher. However, all these as prompted the researcher to examine the challenges and the qualities of a good Mathematics teacher in some selected secondary schools in Bosso Local Government Area.

1.3 Aims/Objectives of the Study

To examine the challenges and qualities of a good mathematics teacher in some selected secondary school in Bosso local government Area of Niger state. The following objectives will guide the study:

- (i) To examine the qualities of a good mathematics teacher.
- (ii) To examine the relationship between mathematic teachers and students in the study Area.
- (iii) To identify factors that influence students' understanding of a good mathematics teaching.
- (iv) To identify the challenges of teaching mathematics and proffer possible solution

1.4 Research Questions

- (i) What are the qualities of a good mathematics teacher?
- (ii) What are the factors that influence students understanding of good mathematics teaching?
- (iii) What is the relationship between mathematic teachers and students in Bosso Local Government Area of Niger state?
- (iv) What are the challenges of teaching mathematics and possible solution in solving these problems?

1.5 Significance of the Study

The following are the significance of this study:

The result of this study will be of benefit to the general public, students, teachers, curriculum developers, ministry of education and the stakeholders in education on the qualities of a good Mathematics teacher and its influence on the students' performance and behavior through the identification of the qualities of a good mathematics teacher and their ability to cope with challenges.

It is hoped that, the study would help the students to promote their achievement and developed their attitudes towards learning of the subject. It is hoped that, the study would help the mathematics teachers to develop a positive attitude to the teaching and learning of mathematics in secondary schools.

It is hoped that the result of the study would help to develop and promote the knowledge of mathematics in Senior Secondary Schools.

It is hoped that the result of this study will help the stakeholders in education to know the causes of mass failure in mathematics in Bosso Local Government Area in Minna, Niger State. It is hoped that, the result would be of help to curriculum developers in reviewing topics that are essential to be studied in secondary schools.

This research will be a contribution to the body of literature in the area of the effect of personality trait on student's academic performance, thereby constituting the empirical literature for future research in the subject area.

1.6 The area of study

The area of study has to do with the particular area where the survey is being conducted. The area of study for this research covers the geographical domain called Niger State of Nigeria.

This is located between latitude 8° and $11^{\circ} 30'$ North and Longitude $30^{\circ} 45'$ and $7^{\circ} 25'$ East. The reason for choosing Bosso Local Government Area is because of accessibility and economics reasons. Particular reference was given to four secondary schools namely: Government Day Secondary School Beji, Day Secondary School Maikunkele 'A', Model Science College Tudun Fulani, Bosso Secondary School Minna

1.7 Scope of the Study This study will cover the attribute of teachers in secondary schools in Bosso local government area. It will cover the qualities of a good Mathematical teacher and also identify the challenges of teaching Mathematics. The category of students to be used in carrying out this research is going to be the students of the senior secondary sections of the schools this is so because they are expected to have better understanding of the content of the questionnaires that will be administered to them than the students of the junior secondary sections of the schools. The research instrument to be used is going to be Questionnaires that comprises of four sections (A,B,C,D).

Sections A and B are designed for the teachers to answer while sections C and D are for the students to answer

1.8 Operational Definition of Terms

In this study, it is important to define the terms that will be appearing during the course of this work.

1.8.1 Qualities

This has to do with what a mathematics teacher needs to acquire by means of undergoing rigorous years of training in order to make his profession as a core subject teacher to be of high standard in the field of teaching and learning.

1.8.2 Challenges

Challenges are those factors which led to the inability of mathematics teachers to accommodate diversity, carry out his or her set objects designed for his learners which led to learning breakdown or which prevent students from accessing educational provisions. Mathematics challenges can therefore be referred to as difficulties that disable the students from solving mathematical problems.

1.8.3 Mathematics

This is a branch of science that deals majorly with calculations, measurements and evaluation of figures and shapes in order to arrive at a conclusion as a final answer. Mathematics has many branches some of which are: arithmetic, algebra, trigonometry and geometry.

1.8.4 Mathematics teacher

A Mathematics teacher is someone who has the ability to process, communicate and interpret numerical information in a variety of contexts for student understanding. Also Mathematics teacher is someone who teaches mathematics by creating lesson plans to instruct their students in general or specific topic. They prepare maths assignments, tests and impart knowledge and understanding to the students assigned to him/her. They also assess student's progress and abilities throughout the school year.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter reviews related literature in respect of challenges and qualities of a good mathematics teacher, to this effect, literature shall be reviewed under the following sub headings; conceptual framework, theoretical framework, empirical studies and Summary of literature reviewed.

2.2 Conceptual Framework

2.2.1 The Nature Of Mathematics Teachers In Secondary Schools In Nigeria

According to Hughes (2013) the most important conclusions from qualitative research on factors related to achievement in schools are that teachers are critical resources; the composition of the student body matters; schools make a difference, and physical facilities, class size, curriculum, instructional strategies and other resources influence student learning indirectly through their effect on the behaviour of teachers and students.

In an effort to identify the causes for low achievement in mathematics, some researchers (Moyana, 2016; Maree, 2014; Murray, 2013; Attwood, 2011; Brodie, 2010; Malcolm *et al.*, 2010) have suggested that achievement in mathematics in secondary schools is influenced by a number of variables. These variables include learners' abilities, attitudes and perceptions, family and socio-economic status, parent and peer influences, school related variables such as poor learning environment, learning cultures, past racial discrimination and low expectations by principals and teachers.

According to Singh *et al.* (2012) many of these variables are home and family-related and thus are difficult to change and beyond control of educators. Such factors alone cannot account for the lack of mathematics achievement and persistent differences among

traditionally disadvantaged learners. In particular these explanations fail to account for intra-group achievement differences and the success of some South African disadvantaged learners in spite of these background factors. Some well-achieving disadvantaged learners come from the same communities and share similar socio-economic backgrounds, schools and classrooms.

In investigating factors that facilitate achievement in mathematics, variables related to school, learners and teachers were reviewed. In this regard Malcolm *et al.* (2010) in their literature review suggest that when investigating factors that facilitate achievement in science and mathematics, a more extensive investigation should consider learner, teacher and school variables. The chapter concludes with some learning theories relevant to secondary school mathematics learning and teaching.

2.2.2 Teaching Mathematics and possible challenges

Teaching generally, not only mathematics is a challenging task and has its own pleasures and difficulties (Abdulmumeen 2013). Moreover, teaching secondary school mathematics can be difficult, discouraging, successful, exciting and amusing (Owolabi 2015). It is exciting because mathematics teachers' work is a profession which is constantly expanding in both content and methodology. Also, mathematics teachers play a significant role in building and guiding the country's future scientists and citizens. Furthermore, mathematics teachers teach one of the most remarkable subjects in the school curriculum. Teaching mathematics can be disappointing and difficult because of the following reasons: Firstly, most mathematics teachers will have to teach another subject. Having to prepare for other lessons may be challenging because a mathematics teacher needs enough time to prepare and plan well for effective teaching and learning activities. Secondly, the number allocated for teaching

mathematics may not be enough for the teacher to involve the learners in many learning activities and at the same time cover the syllabus in time.

Mathematics teachers need to accept the challenge and improve their teaching strategies in every way to make students learn and understand what is being taught. They need to understand both the mathematical content for teaching and students' mathematical thinking. It is essential that mathematical expertise of teachers be developed. Many factors govern the methods of teaching of mathematics. Some of these are the teacher, topic to be covered, age and aptitude of the learners, the size of the class and the facilities available. The most common methods are the lecture, discussion, class activities, class experiments and project work (KLB, 2010). Each of these methods requires the use of one or more instructional resources. Lecture and discussion methods may only require reference from text books while class activities, class experiments and project work may require the use of more than one resource. It is the teacher's duty to choose and organize the appropriate materials for a class activity with regard to the objectives of the lesson. However, these appropriate materials may be lacking in a school and this calls for improvisation of instructional materials from the local environment. According to Olayinka et al. (2012), teaching can only be effective when adequate and relevant instructional materials are used. Many educators and researchers have reported the importance of instructional materials in teaching. (Grant 2016) noted that teaching and learning cannot be effective without adequate and relevant use of instructional materials. Inadequacy of instructional resources can be a great challenge to the teaching and learning of mathematics. (Schramm 2011) referred to instructional materials as basic channels of communication (of ideas and concepts) in the classroom for the purpose of bringing about effective teaching and learning. There was need to establish the availability of these materials in our schools and how effectively they were used.

Mathematics teachers have to use more practical strategies and concrete ways to help students grasp mathematical concepts, improve their proficiency and generalize knowledge in multiple contexts (Merlot Pedagogy, 2013). Practical work is important in teaching and learning mathematics. Proper understanding of concepts being taught requires that they be concretized through the use of suitable experimental/practical work, teaching aids and real life experiences. It is an established fact that we are more likely to remember/internalize what we do than what we see or hear. Practical work in mathematics ensures learners' participation and variation of stimuli. Apart from making theoretical and abstract concepts real and concrete, it enhances learning by promoting curiosity and interest in addition to awakening manipulative skills. The cone below illustrates how the degree of retention increases with increased use of senses. Mathematics teaching is so paramount when it comes to educating every individual of scientific and technological development in any nation. The best set of instructors in position to carry out the task of teaching mathematics as a course or subject are the mathematics teachers. According to Baiyelo (2011) mathematics is widely recognized as the language of science; consequently, Nigeria as a developing country needs scientific innovation in teaching and learning process and as such requires mathematicians that would enable the early and proper realization of this desire. Regrettably, the position of mathematics education in the country at the moment is far from being remarkable. Hence, the place of mathematics in growth of any country cannot be exaggerated. According to Betiki (2011), mathematics education has been widely recommended to be the index of measuring any country's socio-economic and geo-political development. Among science and technology courses, mathematics is one of the core subjects to be offered by all students till the tertiary levels of education. The compulsory nature of mathematics carries with it: the assumption that the knowledge of the subjects is essential for all members of every society. Furthermore,

mathematics competence is a critical determinant of the post-secondary educational and career options available to young people. Barrow and Woods (2013) laid emphasis on the need to make mathematics a compulsory subject at the primary and secondary levels. However, it is also important to note that in our universities, the teaching and learning of mathematics should be considered as a means of improving student's intellect and reasoning. The quality of mathematics that will give room for the much needed pursuit in science and technology at the higher level. This is because good quality mathematics teaching has to do with the attainment of standards and according to Ohuche (2010) the proper and meaningful study of mathematics should assist individual in organizing, investigating and analyzing his/her environment. This is only achievable through active personal experience with material resources. In essence Obodo (2011), lamented the poor state of mathematics instruction in Nigeria and affirmed that the problem of quality of mathematics instruction and learning are from diverse sources.

Cognitive-field theory states that learning process involves constant organization, restructuring, and organization of stimuli elements into a meaningful whole or pattern resulting from many interacting influences in the environment of the learner. Therefore, we should view learning from the perspective of problem solving. Wertheimer (2011) postulates that knowledge is grouped into elements according to the following principles: proximity, similarity/differentiation, closure and simplicity. These principles are called the laws of organization and are used in the context of explaining perception and problem-solving. This theory would be useful to this study because effective learning of Mathematics would be achieved as a result of learners' perception or survey of the problem through the cognitive processes. Infusion theory stated that traditional curriculum material should be restructured to integrate teaching for thinking into subject area so that students would be aware of the

skills, understand it, practise and apply it in other context. In other words, if the teaching of thinking is explicit in subject area it would have a great impact on the students' performance. Swartzts and Perkins (2014) identified various ingredients in Infusion Theory as reliability, causal explanation, argument analysis and the use of evidence for inferences. This theory is relevant to this study because it makes the students understand and learn the content and subject better, interpret meaning of concepts, understand logical structure, detect fallacious arguments and improve academic performance in Mathematics.

2.2.3 Identify the Impact of Quality Mathematics Teachers in Secondary Schools

As stated in the Nigerian Association of Mathematics Teachers' Standards for Excellence in Teaching Mathematics in Australian Schools, "Effective schools are only effective to the extent that they have effective teachers". Because the term effective has been used in various ways in the research literature of the past decades, it is necessary to clarify how it is used in this review. According to Stanford (2011), teacher effectiveness is the degree to which a teacher achieves desired effects upon students. In other words, teacher effectiveness is how much and how well students achieve and demonstrate commitment and resilience in the face of adversity. In general, in terms of Mathematics instruction, best practice is typically thought of as a teaching strategy that generates the desired results and promotes deep student understanding (Stanford, 2011). Larson (2012) recognised that some Mathematics teachers are more effective than others. Effective Mathematics teachers do certain things in common when delivering Mathematics instruction, whether they tend toward the student–discovery or the teacher–directed ways. Ingvarson et al. (2004) theorised that there are four main factors that influence the effectiveness of students' learning outcomes in Mathematics. These are:

- (a) The 'school enabling conditions' – conditions in the school where the students are located;
- (b) The 'teacher enabling conditions' – teachers' experiences and professional developments;

(c) The ‘capacity of the teachers’ – the knowledge, beliefs and understanding of teachers;
and

(d) The ‘teacher practice’ – what teachers do in their classroom?

As stated by Posamentier and Stepelman (2010), effective Mathematics teachers have a broad range of specific teaching strategies available to them. Determining the best strategies for a lesson is an important aspect of teachers’ creative role in the classroom, and every teacher is a resource person who determines which classroom teaching strategies will be most effective. Studies have shown that there are many attributes of an effective Mathematics teacher, and many of these attributes are those that involve the learners. After all, effective teaching is reflective of

effective learning. Posamenteier and Stepelman (1999) reported that effective Mathematics teachers helped develop their students’ positive attitudes by being sensitive to their students’ feelings, by valuing every student’s contribution, by recognising students’ needs for success, by involving students in their own learning, and by making Mathematics exciting and interesting. Seah (2007) speculated that effective teaching and learning might be a function of interactions between teachers and their students, between and amongst students, and between the class and its environment.

2.2.4 Impacts of School and class size

School size and class size have been shown to have an impact on achievement. Lee, Smith and Croninger (2017) observed that larger schools had a negative influence on academic achievement in high school mathematics and science. In contrast, Rutter (2013) found no relationship between the size of the school and scholastic achievement; effective schools can be very small, very large or somewhat in-between. Rutter (2013) further observed that the relationship between the class size and a learner’s achievement is not well defined for classes

with 20 to 40 learners. Class sizes of below 20 learners have been found to be advantageous for deprived learners. In this respect, it was argued that small school size facilitates social interaction and inhibits teacher specialization.

2.2.5 Effectiveness of schools

Effective school characteristics are what help to create a fertile school culture that facilitates learners' achievement. Several researchers (Henson & Eller, 2015; Berliner, 2010, and Rutter, 2013) have identified such characteristics. Their findings indicate that learners excel when the following factors are present (Henson & Eller, 2015; Berliner, 2010, and Rutter, 2013). Strong leadership is provided by a principal who works with the staff to communicate the mission of the school; provide reliable support for staff; and meet with teachers and other members of the staff frequently to discuss classroom practices. High learner achievement is the foremost priority of the school, and the school is organised around this goal as shown by teachers who demonstrate high expectations for learners' achievement and make learners aware of and understand these expectations. Parents are aware of, understand, and support the basic objective of the school and believe they have an important role to play in their children' education. Teachers work together to provide an orderly and safe school environment. Schools use evaluation to measure learners' progress and promote learning.

2.2.6 Strategies To Be Adopted In Order To Ensure Effective Mathematics Teaching In Secondary Schools

Over the past decade, research has confirmed that teachers have substantial impacts on their students' academic and life-long success (Nye, Konstantopoulos, & Hedges, 2014; Chetty, Friedman, & Rockoff, 2014). Despite concerted efforts to identify characteristics such as experience, education, and certification that might be correlated with effectiveness (for a

review, see Wayne & Youngs, 2013), however, the nature of effective teaching still largely remains a black box. Given that the effect of teachers on achievement must occur at least in part through instruction, it is critical that researchers identify the types of classroom practices that matter most to student outcomes. This is especially true as schools and districts work to meet the more rigorous goals for student achievement set by the Common Core State Standards (Porter, McMaken, Hwang, & Yang, 2011), particularly in mathematics (Duncan, 2010; Johnson, 2012).

At the same time, this work highlighted a central challenge associated with looking at relationships between scores from observation instruments and student test scores. Non-random sorting of students to teachers and non-random variation in classroom practices across teachers means that there likely are unobserved characteristics related both to instructional quality and student achievement. As one way to address this concern, the authors' preferred model included school fixed effects to account for factors at the school level, apart from instructional quality, that could lead to differences in achievement gains. In addition, they relied on out-of-year observation scores that, by design, could not be correlated with the error term predicting current student achievement.

This approach is similar to those taken by Jacob and Lefgren (2008), Rockoff, Staiger, Kane, and Taylor (2012), and Rockoff and Speroni (2010), who use principal/mentor ratings of teacher effectiveness to predict future student achievement. Finally, as a robustness test, the authors fit models with teacher fixed effects to account for time invariant teacher characteristics that might be related to observation scores and student outcomes; however, they noted that these estimates were much noisier because of small samples of teachers.

Mathematics learning can be a stressful event due to the social demands and expectations on Singaporean students in terms of mathematics education. This source of stress worsens for

many students who find mathematics difficult (Jackson & Leffingwell, 2010; Burns, 2011; Misra & McKean, 2012). In coping literature, Lazarus and Folkman (2016) first categorised coping strategies in stressful situations into either problem focused (taking behavioural action to alleviate problematic event) or emotion focused (alleviating the expected emotional or physiological distress of the problematic event through controlling or discharging emotions). Later, Carver, Scheier and Weintraub (2012) divided coping into active and avoidant strategies while Higgins and Endler (2011) grouped it into three categories: task-oriented, emotion-oriented, and avoidance-oriented. Cartwright and Cooper (2016) instead perceived coping strategies as being categorised into adaptive and maladaptive ones.

They are also adaptive as suggested by Cartwright and Cooper (2016). On the other hand, if students do not have successful approach strategies, they turn to exhibiting negative coping strategies such as refusing to seek help, avoiding the tasks (avoidant behaviours) or disrupting the class (disruptive behaviours) as they do not know how to, or do not want to, perform the learning tasks allocated to them (Covington, 1992; Newman & Goldin, 2010; Woods, 2015, 2014). These negative coping strategies are termed as avoidant or disruptive strategies (Covington, 2012; Newman & Goldin, 2010). Avoidant or disruptive strategies are in the same category as the avoidant coping strategies in Carver et al. (2012) and Higgins and Endler (2015). And they are usually maladaptive as suggested in Cartwright and Cooper (1996). As for the emotion-oriented strategies as proposed by Lazarus and Folkman (2016) and Higgins and Endler (2015), they are present in both approach and avoidant strategies. Skinner, Edge, Altman and Sherwood (2013) proposed that there are two categories of coping with stress. The first category consists of strategies (problem solving, support seeking, information searching etc.) that are formulated to cope with stress perceived as challenge,

while the other category of strategies (helplessness, opposition, escape etc.) deals with stress appraised as threat.

However, academic emotions are seldom researched on in educational psychology, especially in subjects like mathematics and science (Pekrun et al., 2012). This is due to the common perception that mathematics is a pure cognitive endeavour that is out of bounds to emotional responses. The manner that students cope with mathematics learning can also be strongly related to their mathematical identity and mathematical socialisation (Martin, 2013). Their mathematical identity refers to their belief and perceived importance about mathematics learning and their motivation in, constraints faced when they are learning mathematics (ibid). On the other hand, mathematical socialisation is defined as the experiences students undergo when learning mathematics as a group (ibid). Ewing (2014) proposed that teacher interaction with students in mathematics learning can have an impact on how the students cope eventually in their learning. This study will attempt to explore understand the coping strategies as exhibited by students who do not do well in mathematics learning in the classroom, as individuals or in groups, from a psycho-analytic perspective. Mathematics students have to face the prospect of learning mathematics that is physiologically and psychologically uncomfortable for them in their mathematics classes if they are not coping well in it. Therefore, such students may consciously or unconsciously attempt to reduce such discomforts in their mathematics learning through their thought processes and actions. Such thought processes and actions are “defence mechanisms” that are defined by Freud (2016) as a set of mental processes with self-protective instincts or dispositions that can culminate into protective behaviours. Cooper (2017) sees defence mechanism as “a force struggling to against a counterforce, usually involving undesirable (anxiety-producing) content” and generally associates with the phenomenon of anxiety and

pain. However, through the use of defense mechanisms, individuals can sustain their growth and homeostasis as part of their normal development (Cooper, 2017; Kernberg, 2014). Defence mechanisms are usually perceived to distort and falsify reality in one way or another and are considered unhealthy ways of coping with any anxiety.

2.3 Theoretical Framework

The relevant theory to this work is Guskey's model of conceptual systematic change. In the theory. Even though the majority of Professional development programs in the last 30 years were not conceptualized as a system impacting students' learning of mathematics, but only focusing on teacher outcomes. Some authors (Guskey, 1986) have already advanced the importance of conceptualizing Professional Development through its ultimate impact on students.

Guskey (1986, 1997) presented a model (Figure 1) of teacher change process that teachers go through when participating in professional development programs. This model has the professional development program as the initial triggering mechanism in the change process. However, it recognizes that the student learning outcomes, as observed by the mathematics teachers after they have transformed their classroom practices, are a determinant in promoting teachers' change in beliefs and attitudes.

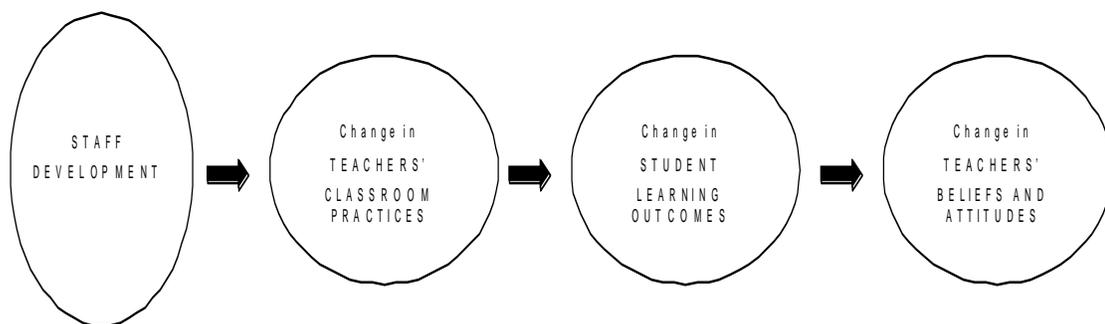


Figure 1: A Model of the process of Teacher Change (Guskey, 1986)

There are several models of professional development present in the literature, one of the most evolved ones is presented by Loucks-Horsley, Hewson, Love, and Stiles (1998) (Figure 2) for designing professional development programs for teachers of science and mathematics. This framework emphasizes the continuous and circular design permeating the implementation of professional development programs. This design is infused by the continuous reflection based on the outcomes of the program to reevaluate and further improve it.

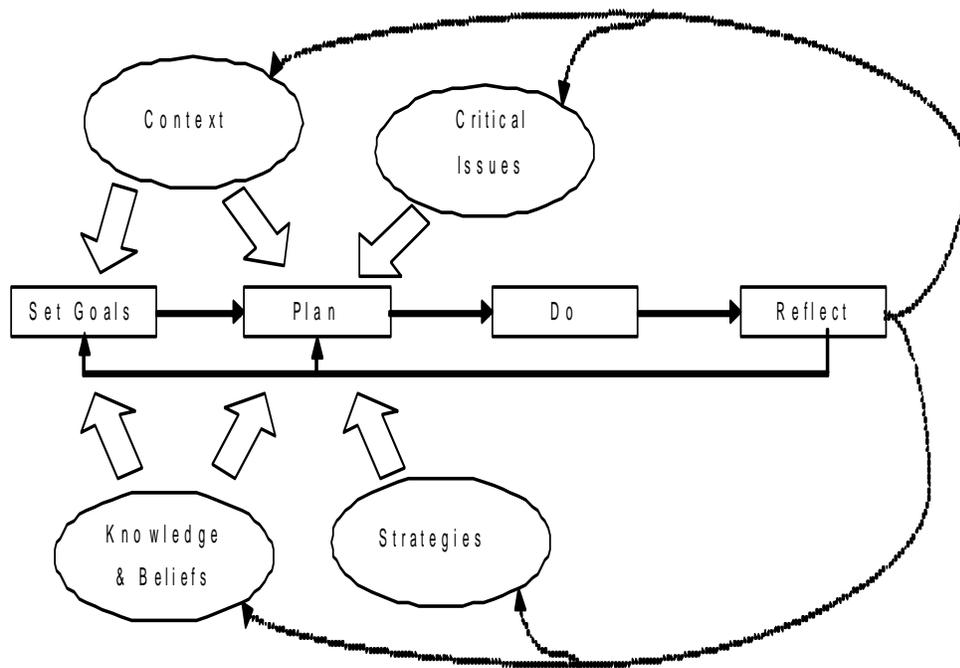


Figure 2: Professional Development Design Process for Mathematics and Science Education Reform (Loucks-Horsley et al., 1998)

Hein (1997) presented a view of the U.S. Educational System where student learning was the ultimate goal and the teachers were portrayed as the main level just before students through which that goal could be achieved. Nonetheless, according to Hein at that time “the evaluation of Teacher Enhancement efforts must focus on observable outcomes for teachers

... (because) the research base that links teacher behavior and student learning is still inadequate” (p. 161).

One may argue that professional development researchers must place student learning at the center of the educational system, and also that it must inform and influence the steps right above it, teacher professional development in particular, since the teachers are one of the greatest influences on student learning. Based on the presented models and frameworks for the structure of professional development and its impact on teacher change, and on this researcher’s firm belief that student learning should be the focal point of the educational system, a theoretical framework for professional development was developed (Figure 3). This framework reflects these researcher’s values about what should guide professional development programs. Three concentric domains characterize the framework. It includes the student learning domain, a teachers’ change/evolution domain, and a professional development domain. Change is a complicated process, not an event (Loucks-Horsley & Roody, 1990). It is not reasonable to expect teachers to change overnight because of their participation in a professional development program. The impact on teachers’ beliefs and attitudes is much more probable to become a reality after they notice an improvement in their student learning outcomes than before. However, intensive and extensive follow up activities of the professional development program are other essential requirements to nurture teacher change. The professional development domain with four main stages (Set goals, Plan, Do and Reflect) adapted from Loucks-Horsley et al. (1998) is incorporated within this framework. The initial stage is the Goal Setting Phase that should immediately start by formulating its goals in terms of student learning outcomes, even though there may be other parallel goals such as building teacher leadership and improving teacher retention.

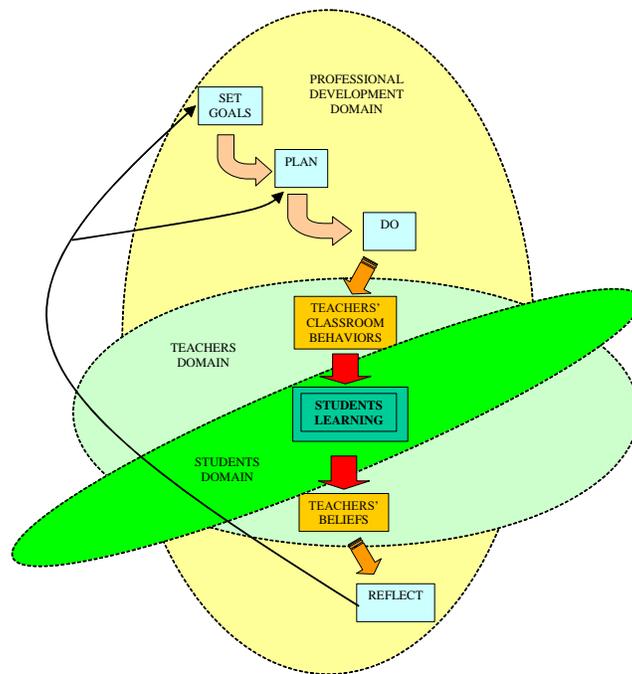


Figure 3: Professional Development Theoretical Framework

The second stage is the Plan Phase where the professional development practitioners develop an action plan. This plan is implemented during the Doing Phase when the professional development program actually interacts with the teachers.

The Reflection Phase is a vital part of the professional development program because it is based on the actual results of the implemented professional development program on student learning and teacher's beliefs. Reviewing, during the Reflection Phase, accommodates necessary changes in the next iteration of every professional development program.

At the center of this framework is the ultimate goal of the professional development framework, the student learning domain. Leading to the goal of student learning is a change or improvement in teacher's classroom practices, often essential to the improvement of student learning. Immediately after student learning, teacher's beliefs are included, anchored in a theory of teacher change (Guskey, 1986; Horsley & Loucks-Horsley, 1998).

On the proposed framework, the students' learning objective is the center and essentially the goal of the entire program. The teachers' level is immediately above it, including teachers' classroom practices, behaviors, and beliefs that have the greatest impact on student learning but are also influenced by feedback received from students' experiences and outcomes. Finally, the professional development domain includes most of the teachers' domain. It also includes the students' learning at its core, and will not only influence the teachers and the students' learning, but will also receive feedback from the students and teacher experiences to restructure the goal setting and planning phases.

The teachers' domain goes beyond the professional development domain of the framework because professional development programs address only some of the issues that affect a teacher's life. Situations such as administrative environment, mandated standardized tests, and teachers' salaries are not within the realm of professional development programs but have important consequences in any teachers' practice. In the same way, the students' domain is extended beyond both the teacher and the professional development domains. Also in this case, some very important conditions such as number of students per class and family environment are not within the range of influence of either teachers or professional developers but do influence student learning. Moreover, the dotted lines at the edge of each domain in Figure 1.3 represent the permeability of the domains to external factors such as politics, economy, or mandated curriculum. These external factors, even though difficult to quantify, have an impact on the framework and must be acknowledged.

The next step in this research is the evaluation of professional development programs. The purpose of the evaluation is to identify the characteristics that have a greater impact on student learning. It is the opinion of this researcher that such research should be conducted at a cross-cultural level comparing professional development programs from different states,

countries, and cultures. Assessing as many and as different professional development programs as possible may be a fruitful avenue of further investigations. Different cultures and countries have promoted professional development programs with different degrees of success. Learning from their strengths and weaknesses is imperative. There is much to be gained by comparing a variety of professional development programs.

2.4 The empirical Studies

Teacher quality matters. In fact, it is the most important school-related factor influencing student achievement. Moreover, teacher compensation represents a significant public investment: in 2002 alone, the United States invested \$192 billion in teacher pay and benefits. Given the size of this investment, there is remarkably little research to guide such critical decisions as whom to hire, retain, and promote. In the absence of a strong, robust, and deep body of research, the debate in this field is largely ideological.

This analysis reviews a wide range of empirical studies that examine the impact of teacher characteristics on teacher effectiveness in order to draw conclusions about the extent to which these characteristics are, in fact, linked with teacher performance. Greater clarity on the empirical evidence can inform the wisdom of current practice, guide state efforts as they struggle with No Child Left Behind compliance regarding teacher quality, and provide direction for future teacher policy decisions. For example, developing an approach to policy that values different and multiple teacher characteristics based on the research evidence may prove promising. It is important to note that many personal characteristics important for a good teacher are not measured in the studies reviewed. The focus is on aspects of teacher

background that can be translated into policy recommendations and incorporated into teaching practice.

The framework for this study includes five broad categories of measurable and policy-relevant indicators to organize the teacher characteristics assumed to reflect teacher quality. It is notable that findings for these characteristics frequently differ for teachers at the elementary school level and teachers at the high school level and that the body of research on the subject of teacher quality suggests that the context of teaching matters (e.g., differences in grade levels, subject areas, and student populations). A refined understanding of how teacher attributes affect their performance across these different teaching contexts can be helpful in determining the range of potentially effective policy options.

The highlights of the empirical evidence include:

Teacher experience: Several studies have found a positive effect of experience on teacher effectiveness; specifically, the “learning by doing” effect is most obvious in the early years of teaching. Teacher preparation programs and degrees: Research suggests that the selectivity/prestige of the institution a teacher attended has a positive effect on student achievement, particularly at the secondary level. This may partially be a reflection of the cognitive ability of the teacher. Evidence suggests that teachers who have earned advanced degrees have a positive impact on high school mathematics and science achievement when the degrees earned were in these subjects. Evidence regarding the impact of advanced degrees at the elementary level is mixed.

Teacher certification: Research has demonstrated a positive effect of certified teachers on high school mathematics achievement when the certification is in mathematics. Studies show little clear impact of emergency or alternative-route certification on student performance in either mathematics or science, as compared to teachers who acquire standard certification.

Teacher coursework. Teacher coursework in both the subject area taught and pedagogy contributes to positive education outcomes. Pedagogical coursework seems to contribute to teacher effectiveness at all grade levels, particularly when coupled with content knowledge. The importance of content coursework is most pronounced at the high school level. While the studies on the field experience component of teacher education are not designed to reveal causal relationships, they suggest positive effects in terms of opportunity to learn the profession and reduced anxiety among new teachers.

Teachers' own test scores. Tests that assess the literacy levels or verbal abilities of teachers have been shown to be associated with higher levels of student achievement. Studies show the National Teachers Examination and other state-mandated tests of basic skills and/or teaching abilities are less consistent predictors of teacher performance. Given that many dimensions of teacher characteristics matter preparation in both pedagogic and subject content, credentials, experience, and test scores the findings from the literature imply that there is no merit in large-scale elimination of all credentialing requirements. Nor are improvements in teacher quality likely to be realized through the status quo. Rather, teacher policies need to reflect the reality that teaching is a complex activity that is influenced by the many elements of teacher quality. Most of the research does not seek to capture interactions among the multiple dimensions of teacher quality, and as a result, there are major gaps in the research that still need to be explored. Nor does the research fully address evidence about teacher quality at the elementary and middle school levels, in subjects other than mathematics, or among different populations of students (such as high poverty, English language learners, or special education).

In opposition to those who propose to eliminate all requirements for entering the teaching profession, this analysis supports a judicious use of the research evidence on teacher

characteristics and teacher effectiveness. The evidence indicates that neither an extreme centralized bureaucratization nor a complete deregulation of teacher requirements is a wise approach for improving teacher quality. What holds a great deal more promise is refining the policies and practices employed to build a qualified body of teachers in elementary schools, middle schools, and high schools; for disadvantaged, special needs, and advantaged students; and for math, science, languages, English, social studies, and the arts. Education policy makers and administrators would be well served by recognizing the complexity of the issue and adopting multiple measures along many dimensions to support existing teachers and to attract and hire new, highly qualified teachers. The research suggests that investing in teachers can make a difference in student achievement. In order to implement needed policies associated with staffing every classroom—even the most challenging ones—with high-quality teachers, substantial and targeted investments must first be made in both teacher quality and education research.

2.4 Summary of Literature Review

This research is built on the model of conceptual systematic change and conceptual model of Teaching Mathematics and possible challenges. Also In this chapter, The Nature Of Mathematics Teachers In Secondary Schools In Nigeria, academic achievements and some factors that associate with it have been clarified. More so, the concepts of class size, ideal learning environment and their factors have been efficiently been addressed. Additionally, Learning, its concept and theory have been attended to in like manner after a detail explanation of mathematics, its teaching and learning, challenges and prospects. Besides, a brief description of the area of this study has been provided.

In the last part of this chapter, empirical works have been carried out on some of the previous literatures that are related to this work. The researcher studied, analyzed and objectively

criticized this works and found a reason to carry out new studies at different region with more suitable method and manner of approach which shall efficiently fill the gap. Most of the work reviewed focused on students' academic achievements which is been measured by standard tests or examinations prepared mostly by national bodies. It is always known that many schools make special preparation for the standard tests and examinations organized by the external examination bodies and scholarship examinations, and this help the students to perform more than usual. Some students attend external lesson classes just for the sake of passing these standard examinations. Therefore, the results obtained from these examinations do not always showcase the real performance of the students in mathematics. And some of the work reviewed organized an achievement tests on which their work depends on. This also cannot give the real and clear picture of what the performance of the students is because a single test which is not standard cannot be fair enough to explain students' understanding and performance. Some also conducted their research on SS3 students who have spent more than two years in the senior secondary level and JSS3 students who have spent more than 2 years in the junior secondary level and might have identified some of their weaknesses and worked towards it. Therefore, this work focuses on the students' performance which is determined by what the student does within the term or session and measured by a local tests or examinations made by the teachers. This shall give the clear picture of the students' performance in their local and less prepared examinations. And the work shall use the SS1 students who spend less than a year in the senior secondary category and who are still under control of many factors that affect learning and performance.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 INTRODUCTION

This chapter deals with the research design, population, sample and sampling techniques, the instrument used, validation and reliability of the instrument, data collection and analysis. Other areas discussed are the limitations of the study and finally, the summary of the chapter was given.

3.1 Research Design

The researcher chose a survey research design because it best served to answer the question and the purpose of the study. The survey research is one in which a group of people or items is studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group, in other words, only a part of the population is studied, and findings from this are expected to be generalized to the entire population. Hassan (2017) defines research as a framework of methods and techniques chosen by a researcher to combine various components of research in a reasonable logical manner so that the research problem is efficiently handled.

3.2 Population

A population is defined as all elements (individuals, objects and events) that meet the sample criteria for inclusion in a study.

In order to avoid ambiguity of data obtained, the survey only took place in the senior secondary section of the targeted schools and the target population for this study according to data obtained from the state ministry of education is 11 mathematics teachers and 2275 students from four secondary schools i.e 3 mathematics teachers and 421 students from

Government Day Secondary School Beji, 2 mathematics teachers and 329 students from Day Secondary School Maikunkele

'A', 3 mathematics teachers and 470 students from Model Science College Tudun Fulani, 3 mathematics teachers and 1055 students from Bosso Secondary School Minna

The breakdown of the population is presented in table 3.1

Table 3.1: Population for the study

Name of School	Population	
	Teachers	Students
Government Day Secondary School Beji	3	421
Day Secondary School Maikunkele 'A'	2	329
Model Science College Tudun Fulani	3	470
Bosso Secondary School Minna	3	1055
Total		2275

3.3 Sample and Sampling Techniques

A sampling is a small group of elements or subjects drawn through a definite procedure from a specified population. Samples are meant to represent population when the entire population cannot be studied. The students making this sample are those that are actually studied.

The sampling technique used was a convenient sampling and the researcher made sure that the technique has the same characteristics features which exist and which are required in all the population. A sample size of 200 was chosen from the population. 3 mathematics teachers

and 47 students from Government Day Secondary School Beji, 2 mathematics teachers and 47 students from Day Secondary School Maikunkele 'A', 3 mathematics teachers and 48 students from Model Science College Tudun Fulani, 3 mathematics teachers and 47 students from Bosso Secondary School Minna. The details of the sampling is presented in table 3.2

Table 3.2: sample for the study

Name of School	Population	
	Teachers	Students
Government Day Secondary School Beji	3	47
Day Secondary School Maikunkele 'A'	2	47
Model Science College Tudun Fulani	3	48
Bosso Secondary School Minna.	3	47
Total		200

3.4 Research instrument

A questionnaire was used as data collection instrument. A questionnaire is a printed form designed to elicit information that can be obtained through the written responses of the subjects. The information obtained through a questionnaire is similar to that obtained by an interview, but the questions tend to have less depth. The questionnaire is divided into four sections, section A,B,C and section D. section A and B is aimed at gaining demographic data with total of twenty items. Section C and D contains eleven and seven items respectively making a total of eighteen items. Making a total of thirty-eight. items overall. In section A, the respondents were required to react to each item by a tick () while in section B, students

were instructed to tick options along a likert scale of 5 to 1 according to their degree of agreement with the statement in the questionnaire.

The values allocated to the scale are as follows: -

Strongly agree	(S.A)	5points
Agree	(A)	4 points
Undecided	(U)	3 points
Disagree	(D)	2 points
Strongly Disagree	(S.D)	1 points

Decision Rule Note

f = Frequency

% = Percentage

\bar{x} = Mean

If \bar{x} is below 2.0 it is considered **rejected**.

If \bar{x} is 2.0 and above it is considered **accepted**.

3.5 Validity of Instrument

The questionnaire designed for the study was subjected to a validation process for face and content validity. In the validation process, copies of the questionnaire was given to project supervisor and other two experts in the Department of Science Education, Federal University of Technology, Minna. They went through the questionnaire carefully to ascertain the appropriateness and adequacy of the instrument. The instrument was scrutinized for content, organization and ambiguity. The judges of the instrument indicated that the instrument is valid. However, some items were dropped and rephrasing of some questions were done in line with the assessment.

3.6 Reliability of Instrument

Having validated the questionnaire, a pilot testing was carried out for reliability of the instrument and from the pilot test, the researcher was able to understand the ambiguity of some items and had to modify it to the level of the respondents.

3.7 Method of Data Collection

After the pilot testing and all necessary modification, the questionnaires were administered directly to the chosen sample for the study. All the respondents completed the questionnaire in the presence of the researcher. Eighty copies of the questionnaire were given out to respondents and they were successfully completed and returned. This possibility of retrieving back all the questionnaire was as a result of the subject teachers who offered a helping hand. The students' end of year promotion examination results in further mathematics was obtained from the selected secondary schools through the examination officers of various schools.

3.8 Method of Data Analysis

. The analysis of the data for the study was analyzed using Statistical Package for Social Science (SPSS) version 19.0 and the result of the analysis are presented in order to answer the research question

CHAPTER FOUR

DATA ANALYSIS, RESULT AND DISCUSSION

The study was designed to ascertain the challenges and qualities of a good mathematics teacher. This chapter focus on the analysis and presentation of data collected for the purpose of this study. The analysis of the data for the study was analyzed using Statistical Package for Social Science (SPSS) version 19.0 and the result of the analysis are presented in order to answer the research question. This involves the use of mean and standard deviation statistics to analyze the data that has been generated.

4.2 Presentation of Result

4.3.1 Research Question One

What are the qualities of a good mathematics teacher?

Sequel to research question 1, the researcher computed data base on the responses of 60 respondents to the questionnaire items and presented the results as shown below

Table 4.3.1

S/N	Item	SA	A	UD	D	SD	Mean	SD	Remark
1	A good mathematics teacher should have strong mathematics content knowledge	120	20	33	22	5	1.86	1.19	Not sig
2	Good mathematics teachers are caring and approachable when students need further help to understand their work	55	61	61	11	12	2.32	1.12	Sig
3	Good mathematics teachers are passionate about the mathematics and share their broad knowledge and love	42	125	8	9	16	2.16	1.06	sig

	of the subject in a way that inspire students								
4	He/she putting students previous knowledge into consideration first before introducing new topic	8	154	17	7	4	2.32	0.89	Sig
5	He/she must use range of assessment practices to support students learning	31	29	81	41	18	2.93	1.15	Sig
6	Selecting and solving higher level tasks and examples	43	45	68	30	14	2.64	1.18	Sig
7	He/she should be seeing supporting student in creating connections between mathematical representation and topics	47	42	63	29	19	2.65	1.25	Sig
8	A good mathematics Teacher must have knowledge on how students learn mathematics in classrooms	23	74	66	19	18	2.68	1.09	Sig
9	Placing mathematics in a real world context	21	75	69	19	16	2.67	1.05	Sig
10	Carefully selecting learning tools and representation to provide support for students thinking	9	71	88	21	11	2.77	0.90	Sig
11	Modeling correct usage of mathematics terms and definitions	7	49	95	33	16	3.01	0.94	Sig
12	Giving out questions and tasks that boosts students thinking	11	45	79	52	13	3.06	0.98	Sig
13	A good mathematics Teacher finds ways to make mathematics comprehensible for students	12	71	73	35	9	2.79	0.95	Sig
14	showing different ways of solving a problem	69	67	36	17	11	2.17	1.17	Sig

15	Students obtaining good score in assessment	47	67	43	42	1	2.14	1.08	Sig
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Table 4.3.1 shows the qualities of a good mathematics teacher and the highest mean score in this table shows that giving out questions and tasks boosts students thinking and this is considered significant because it is above 2.0 and the lowest mean score of the above table shows that good mathematics teacher should have strong mathematics content knowledge it is considered insignificant because it is lower than 2.0

4.3.2 Research Question Two

What are the factors that influence students understanding of good mathematics teaching?

Table 4.3.2

S/N	Item	SA	A	UD	D	SD	Mean	SD	Remark
1	That time allocated for the use of demonstration method influences students achievement in mathematics	94	38	0	45	45	2.10	1.25	Sig
2	That the number of students in the class does not have influence on the use of mathematics teaching methods	34	86	0	28	52	2.37	0.93	Sig
3	That the teacher's qualification and experience influences mathematics teaching methods	48	118	0	13	21	2.00	0.78	Sig
4	That cultural background has influence on the use of mathematics teaching methods	19	126	0	37	18	2.27	1.07	Sig
5	That students' motivation and interest of mathematics teachers can affect the use of teaching methods in mathematics	43	27	0	101	29	2.58	0.99	Sig

Table 4.3.2

This table shows the factors that influence students understanding of good mathematics teaching and the lowest mean here talks about the teachers' qualification and experience also influences mathematics teaching methods it is considered as significant because it is beyond the 2.0 benchmark and the highest mean score of the distribution in the table shows That

students' motivation and interest of mathematics teachers can affect the use of teaching methods in mathematics. It is also considered as significant because it is beyond the 2.0 benchmark.

4.3.3 Research Question Three

What is the relationship between mathematics teachers and students in Bosso

Local Government Area of Niger State?

S/N	Item	SA	A	UD	D	SD	Mean	SD	Remark
1	I entertain fear when my mathematics teacher enters class	57	48	0	71	24	2.31	1.01	Sig
2	Am always scared to ask my mathematics teachers questions based on the topic taught	68	47	0	61	24	2.21	1.04	sig
3	My mathematics teacher is aware of the topic that are very difficult to us	38	66	0	77	19	2.39	0.90	Sig
4	My mathematics teacher adapts to variations in our abilities and backgrounds	26	77	0	78	19	2.45	0.84	Sig
5	My mathematics teacher gives every member of the class chance to express his/her own opinion	13	69	0	97	21	2.63	0.76	Sig
6	My mathematics teacher uses praise and rewards to encourage us	9	51	0	97	43	2.87	0.80	Sig
7	I feel safe and secured in mathematics class	11	53	0	79	57	2.91	0.88	sig
8	My mathematics teacher supports me both academically and otherwise	9	77	0	76	38	2.72	0.82	Sig
9	I have confidence in myself that I will perform very well in mathematics	52	69	0	58	21	2.24	0.96	Sig
10	My mathematics teacher really wants me to learn	27	65	0	68	40	2.60	0.96	Sig
11	I like my mathematics teacher so much	47	42	19	63	29	2.65	1.25	Sig

Table 4.3.3

This table shows the relationship between mathematics teachers and students in Bosso Local Government Area of Niger State, In this table it is indicated that the lowest mean in the table shows that the students are scared to ask their mathematics teachers questions in the process of teaching particular topic. It is considered as significant because it exceeds the 2.0 benchmark. And the highest mean in this table indicates that most students feel secured in the process of learning mathematics it is also considered as significant of the items used.

4.3.4 Research Question Four

What are the challenges of teaching mathematics and possible solutions in solving these problem?

S/N	Item	SA	A	UD	D	SD	Mean	SD	Remark
1	My teacher teaching gives me good mathematical understanding	23	72	18	66	21	2.70	1.09	Sig
2	My mathematics background in junior class is sufficient in supporting my understanding of mathematics than my teacher teachings	21	74	16	60	20	2.68	1.05	sig
3	My colleagues helped me on the understanding of mathematics than my teacher	22	70	9	88	11	2.78	0.93	Sig
4	My teacher's methods of teaching influenced my understanding of mathematics	68	46	1	61	24	2.22	1.06	Sig
5	I gained more knowledge and understanding after completing my personal assignment than during my teacher teaching in class	38	77	1	65	19	2.40	0.92	Sig
6	The immediate classroom situation (the students, the mathematics topic at hand, time constraints) influenced my understanding of mathematics teaching	78	76	1	19	26	2.47	0.86	Sig
7	My mathematics beliefs (about the nature of mathematics learning mathematics, teaching mathematics) influenced the development of my good mathematics understand	69	97	13	13	21	2.63	0.76	Sig

Table 4.3.4

This table shows the challenges of teaching mathematics and possible solutions in solving these problem. In this table it shows that the lowest mean (2.22) indicates that the teacher's method of teaching is not helping the students in understanding mathematics. And the highest mean score shows that the students help themselves in the understanding of mathematics which implies that the teacher's method is not helping most of the students. The two items in this table is considered as significant because they are beyond the benchmark.

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CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In this chapter, the researcher demonstrated whether the research work has answered the problems that were initially stated at the beginning of the investigation. The summary of the most significant results and findings of the research are discussed. Lastly, recommendations on what need to be done as a result of the findings were made.

5.1 Summary of the research

The aim of the investigation was to find out the challenges and qualities of a good mathematics teacher in Bosso local government. Four research objectives to guide the study were made. The first objective was to examine the qualities of a good mathematics teacher. secondly, To examine the relationship between mathematic teachers and students in the study Area. Thirdly, to identify factors that influence students' understanding of a good mathematics and lastly to identify the challenges of teaching mathematics and proffer possible solution.

The nature of the study was descriptive and the research design adopted was survey. This design was selected in order to help the researcher understand the problem at hand in a systematic and in an objective manner. The population of the study was the mathematics teachers and students of senior secondary schools in Bosso local government. The population targeted four schools, but due to challenges in accessing and covering the entire schools, the researcher selected a representative sample through the random sampling technique and four schools were selected from the three schools. The sample size was 200 comprising of both the mathematics teachers and the students. Data was collected through questionnaires. The collected data was coded and analysed using description, frequencies and tables.

5.2 conclusions

Based on the result of the study, the following conclusions were made.

The mathematics teacher has no strong mathematics background which makes it hard for them to explain some worked examples to the students.

The mathematics teachers suffer a lot during the course of teaching the students because the facilities i.e tables and benches put in place for the students to sit are not sufficient thereby leaving the students with no other choice but to sit on the bare ground when the lesson is going on.

The findings also indicated that the mathematics teachers are not carrying all the pupils along in the cause of the lesson which eventually result into the students not understanding what the teacher is teaching in the class.

Also, the results showed that the students' performances in mathematics was below average, and was influenced by the teachers' lack of ability to explain properly

5.3 Recommendation

Since the findings showed that the facilities needed for the teaching and learning activities to take place and be effective are not available, the authorities should provide adequate resources and fund

When the teachers are underpaid, they tend to lose focus and become lazy to teach the students. The government or authorities in charge should look into the issues of salary payment and make it adequate.

The government should build more schools so as to carter for the growing population of Bosso local government.

One of the main challenges that were found out from this research is the issue of qualifications and the lack of funds from the authorities. Therefore, the authorities should

strive to provide the teachers with the required instructional materials needed for the effective teaching and learning of mathematics. The authorities should ensure they provide the teachers with improved standard of living.

Additionally, the government should increase the budget allocation to the schools.

Also, companies, philanthropies, non-governmental organisations should assist the government in identification, voicing out and funding the public schools.

5.4 Recommendation for Further Study

As discussed in the literature review of this work, there are numerous factors related to the physical environment that influence the academic performance in the secondary schools in local government which need further research. Therefore, the followings should be included in the further research.

Further research should also be conducted to find out whether the effect of the learning environment on the academic performance is gender sensitive.

Further research should be conducted to check the government allocation and implementation of budget of secondary schools.

Further research work on the influence of physical learning environment on the academic performance of other subjects should be conducted.

Lastly, further research should also be carried out on the effective and efficient seats and sitting arrangements in the classroom.

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