TEACHER CLASSROOM INTERACTIVE BEHAVIOR AND STUDENTS' MATHEMATICS PERFORMANCE IN PUBLIC SECONDARY SCHOOLS, MAKINDYE DIVISION, KAMPALA, UGANDA

BY

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DECLARATION

I, Asmaa Elsayed Emara, declare that this dissertation is my original work and that it has not been presented for a Degree or any Academic Award in any University or Institution of Learning.

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APPROVAL

I confirm that the work reported in this thesis was carried out by the candidate under my supervision.

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Dr. Sofia Sol T. Gaite

Supervisor

Date____________________________

DEDICATION

To the one who pleases my heart and blesses

To the flower garden that sprouts flowers blossoms

Mom: Fawzyah Saleh Abd- Aljawad

To the symbol of manhood and sacrifice

my father: Elsayed Owies Emara

To those who pushed me to gain more knowledge, expertise and skills,

My lecturers, friends and supervisor.

To those who share with me the bosom of pain, and through them I draw my strength and my determination

My siblings: Dr. Ahmed Owies Emara and Dr. Alzahraa Owies Emara

To whom I shared my thoughts who are closest to my soul

My husband: Dr. Mohamed said,

my children, Abed Mohamed and Nosyba Mohamed.

To this young and mighty scientific edifice:

Kampala International University

I dedicate this research.

Researcher: Asmaa Elsyed Owies Emara.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

DAS	District Administrative Secretary
DEO	District Education Officer
KCCA	Kampala City Council Authority office
LTFLYE	Last Term for Last Year Examination
MES	Ministry of Education And sport
MEST	Ministry of Education, Science and Technology
MOEVT	Ministry of Education and Vocational Training
NCTM	National Council of Teachers of Mathematics
RAS	Regional Administrative Secretary
S3,S4	Senior three, Senior four
SEFTE	Secondary end of first term examination
S-S	Student –Student Interaction behavior
S-SM	Student – Subject Matter Interaction behavior
T-R	Teacher – Resource Interaction behavior
T-S	Teacher – Student Interactive behavior
T-SM	Teacher – Subject Matter Interactive behavior
UCE	Uganda Certificate of Education
UNESCO	United Nations Educational, Scientific and Cultural Organization

LIST OF FIGURE

ABSTRACT

The study investigated teacher classroom interactive behavior and students' mathematics performance in public secondary schools in Makindye Division, Kampala, Uganda. The study objectives were; to examine the relationship between classroom management and student's mathematics performance in public secondary schools, to establish the relationship between lesson development and student's mathematics performance in public secondary school and to assess the relationship between materials use and student's mathematics performance in public secondary schools. The study employed descriptive correlational design. Correlation was used to determine the relationship between teacher classroom interactive behavior and student's mathematic performance. The researcher used both qualitative and quantitative approaches. This method was good at providing a better understanding of the research problem. The target population was 993 respondents, which included senior four students and 12 mathematics teachers from four selected schools. Questionnaires, observation checklists and interview guide were used to gather data. Frequency, percentage, means, standard deviations and Pearson Linear correlation coefficient were used to analyze the data. The findings on this first objective revealed that teachers' classroom management had no significant relationship on students' performance in mathematics in the studied schools. The findings also showed that there is an insignificant relationship between lesson development and students' mathematics performance. On materials use the findings showed that there is insignificant relationship on the students' mathematics performance. Based on the findings the following were the conclusions, that classroom management, lesson development and materials use have no relationship with students' mathematics performance. The kind of classroom interactive behaviour exhibited by mathematics teachers do not help to promote students' performance in the mathematics. The study recommends that as for classroom management, a mathematics teachers need to exhibit flexibility and emphasize roll calls before or after class. As for lesson development, mathematics teachers need to improve on the way they begin their lessons to attract, excite and stimulate the students more, as well as they must use appropriate methods and encourage more student's participation In materials used, teachers need to do improvisation of some local materials which can be used in the lessons.

CHAPTER ONE
INTRODUCTION

1.0 Introduction

This chapter contains the background of the study, statement of the problem, purpose of the study, specific objectives, research questions, and hypotheses, scope of the study and significance of the study.

1.1 Background of the Study

The background of the study presented the historical, theoretical, conceptual and contextual perspectives.

1.1.1 Historical Perspective

In the last three decades, teacher classroom interactive behavior has been highly debated across the globe as one of the major predictors of performance of students. For instance, in Sweden, teacher classroom behavior has significantly influenced the performance of students in the recent history. In this way, the students condition their teachers' behavior and vice-versa. The interaction has been mainly based on teaching and/or learning process through verbal and non-verbal actions. The verbal actions are mainly featured through dialogues, whereby a teacher may ask question and the student can respond to the question. The behavior can also be non-verbal by giving the students problems to solve, working out problems on the chalkboard or marking students work (Ifamuyiwa, 2008).

In Africa, Nigeria has been striving for quality education by advocating for teaching methods that make a positive impact to learners. The reformation of the secondary school curriculum of 2005 with the objective of making it an outcome-based-curriculum signifies effective teacher behavior to be emphasised in classroom operations (MET, 2005). In South Africa, teacher classroom behavior have played a vital role in the emotional life of learners in particular, and also provide good learning outcome to the school as teacher are expected to have greater contribution on their educational achievements.

In Uganda, stimulating classroom interactive behavior require skills and proficiency in the course of accomplishing to learning objectives, this is because teacher classroom interactive behavior allow students to raise their questions and comments and the teacher has to provide relevant responses that motivate students to learn. The activity of teaching mathematics subject involves the behavior of a teacher, students and materials that supports teaching and learning process. During teaching mathematics subject in the classroom, the teacher's role is to induce learning process through instruction and tasks, therefore teacher lesson development matters a lot because for any teacher to achieve better results, all the lessons must be interesting and interactive (Mhando, 2007). For effective mathematics subject teaching to occur, the teacher and learners have to interact to the maximum in all planned activities within a class.

1.1.2 Theoretical Perspective

The two theories that underpinned the study are Social; Learning Theory by Albert Bandura (1977) and Symbolic Interactionism Theory by Blumer (1986) and Mead (1994).

The Social Learning Theory by Albert Bandura (1977). According to this theory, people learn from one another through observation, imitation and modelling. The theory bridges between behavioral and cognitive learning theories because it encompasses attention, memory and motivation.

The symbolic interactionism theory by Blumer (1986) and Mead (1994) is one of contemporary educational theories which support Bandura's theory. And one of the main axes on which social theory relies, in analyzing social patterns. It starts with the level of the micro units (micro), from which they begin to understand the larger units, meaning that they start with individuals and their behavior as an input to understanding the social pattern. The actions of individuals become fixed to form a structure of roles. These roles can be seen in terms of people's expectations of each other in terms of meanings and symbols. The focus becomes either on social roles and patterns, on social behavior and action. Although they see social structures implicitly as role structures in the same way. Parsons (1979) view it as they do not occupy themselves with analysis at the level of patterns. as much as they are concerned with the symbolic interaction formed through language, meanings and mental images, based on the important fact that an individual must accommodate the roles of others. Then symbolic interactivity theory focuses on the study of interactive processes. And that is what is required by the process of educational teaching within the class. Hence, came the researcher's choice of theory because it is related to the subject of study which is teacher classroom interactive behavior and students' mathematics performance.

1.1.3 Conceptual Perspective

Teacher classroom interactive behavior are diversely defined. Gablinske (2014) refers teacher interactive behavior as specific actions that allow for positive communication between the teacher and students. Classroom interactive behavior focuses mainly on what teachers are doing in the class with students in order to reach at the learning outcome prepared by the school. The development of learning skills such as listening, speaking and understanding or thinking is happening in the classroom under teacher classroom interactive behavior. According to (Mbunda ,1996) normal classroom practices which include student's speaking, be listened to, answering both teacher's and other students' questions, asking questions to the teacher, teacher asking and answering students questions.

Classroom interactive behavior involves teacher's conversation with learners, collaborative learning, classroom discussions, classroom management, lesson development, dissemination of knowledge, resource management and role play (Mbunda, 1992). In this study the researcher concentrated on three items that mainly happen in the classroom during the lesson activities namely, classroom management, lesson development and materials used because they are the most common classroom interactive behavior in secondary schools that are registered with the Ugandan education system to date (MOE, 2014).Various activities are necessary for teachers to perform their role during classroom interaction in order to contribute to students' mathematics performance. Some of the key activities to be performed include the use of relevant teaching methods, instructional planning, classroom control time, question skills and techniques, student participation, gender concerns and relevant instructional materials.

Academic performance refers to the way in which someone or something function. In this study performance is the ability of students to demonstrate what they know or learn about mathematics. This includes results of last term for last year examination, December, 2018 when they were in Senior three (S3) and results of secondary end of first term examinations, May, 2019, they are in Senior four (S4)

1.1.4 Contextual Perspective

In Uganda according to UCE (Uganda Certificate Examination) the performance of mathematics has been poor as it continues to decline to several years and the ministry of education and sport has put practically some measures to improve the performance of students in mathematics beginning with teacher training collages to levels reaches to university levels. First the curriculum has been reviewed and improved several times to make sure that the performance of mathematics improve in the country, also teachers and facilities are availed to schools. As well as the quality programs in the Ministry of Education that supervise on the way instruction in schools is taking place .The quality program observed that the teachers' classroom management , scheme of work, lesson plan, providing teaching aids and school text books before going to class is consider one of important factors that are pushing to improve the student's performance in mathematics .in addition to ,the program supervise on proper appointment of Head teachers, and service training including short courses and seminars as well as long courses to secondary school teachers in all the country , but still the students achievement especially in mathematics has remain poor for many years compared to other subjects in Uganda ,public secondary schools (MOET, 2014).

The main challenge is the teacher issues like quality of teachers and their awareness of the reforms to be implemented. Teaching methods are old fashioned and traditional and books are not only inadequate but those that are available are not always used effectively. Sometimes in secondary levels many students leave school without having mastered required levels of literacy and numeracy. UNESCO has developed a tool which aims to analyze teacher issue in integrated manner. In Makindye Division it showed that for the last three years form 2015 T0 2017 the performance of students in mathematics were declined. It is on this premise that the researcher wanted to know if the teachers' classroom interactive behavior can affect the students' mathematics performance, hence this study.

1.2 Statement of the Problem

Mathematics is considered by many educators to be an important tool for organizing ideas and understanding the environment in which we live. It helps the individual to understand and control the surrounding environment in order to being an inventor or a retriever. Mathematics grows and permeating of through our sensory experiences. In fact, or through our material needs and motivations. Some educators complain about the lack of continuity and interaction between the teacher and the students, and how the absence of the principle of interaction means the existence of problems experienced by the educational family or the existence of a defect in the separation system and management or tension between the teacher and his students and ignorance of teachers channels of communication between them and their students Martin, (1993) **,** Hassan Shehata and Abu Amira, (1994) and Dunleavy et. al (1997). Hence, the study attempts to shed light on this problem and find solutions to it.

Teacher classroom interactive behavior is a result of a number of factors, which differs from one teacher to another, from school to school as well as from one region to another and country to country. As a result, studying classroom behavior cannot be generalised. It should be undertaken specific to different teacher since it has large contribution of students' performance and more especially in mathematics.

Despite considerable educational reforms in Uganda, there have been tremendous dropping of students 'performance especially in mathematics year after year both in public and private secondary schools. For instance, in the year 2015, 4800 sat for the examination only 1200 passed. In Makindye division, the passers in three consecutive years were 25%, 36% and 38% of students who sat for mathematics Mock examinations in 2015, 2016, and 2017 respectively (MEST, 2017).

As students' academic performance in mathematics continue to decline, there have been mixed feelings among researchers and education practitioners, mostly attributing to the weaknesses in teaching approaches. Thus, this study investigated the relationship between teacher classroom interactive behavior and students 'mathematics performance in public secondary schools in Makindye Division, Kampala, Uganda.

1.3 Purpose of the Study

The study investigated the relationship between teacher classroom interactive behaviour and students mathematics performance in public secondary schools, Makindye Division, Kampala, Uganda.

1.4 Specific Objectives

The following were the specific objectives:

1. To examine the relationship between classroom management and students mathematics performance in public secondary schools in Makindye Division, Kampala, Uganda.
2. To establish the relationship between lesson development and students mathematics performance in public secondary school in Makindye Division, Kampala , Uganda.
3. To assess the relationship between materials use and students mathematics performance in public secondary schools in Makindye Division, Kampala, Uganda

1.5 Research Questions

The study sought to answer the following questions;

1. What is the relationship between classroom management and students mathematics performance in public secondary schools students in Makindye Division, Kampala, Uganda?
2. What is the relationship between lesson development and students mathematics performance in public secondary schools in Makindye Division, Kampala, Uganda?

3. What is the relationship between materials use and students mathematics performance in public secondary schools in Makindye Division, Kampala, Uganda?

1.6 Null Hypotheses

$H0_1$. There is no relationship between classroom management and students mathematics performance in public secondary schools in Makindye Division, Kampala, Uganda.

$H0_2$. There is no relationship between lesson development and students mathematics performance in public secondary schools in Makindye Division, Kampala, Uganda.

$H0_3$. There is no relationship between materials use and students mathematics performance in public secondary schools in Makindye Division, Kampala, Uganda.

1.7 Scope of the Study

The scope of the study included geographical scope, content scope, theoretical scope and time scope.

1.7.1. Geographical Scope

The study was conducted in Makindye Division. Makindye division is one of the five administrative divisions of Kampala, the capital of Uganda and the largest city in the country. There were four public schools in Makindye Division and these were Kibuli Secondary School, St. Denis Ssebugwawo Secondary School, St. Peters Nsambya Secondary School and Kansanga Seed Secondary School. All of the four schools were used for the study. Makindye Division was used because the results in UCE showed that there was a poor performance of students in mathematics. (See map of Makindye Division in the appendix)

1.7.2. Content Scope

The study focused on teacher classroom interactive behavior and students' mathematics academic performance. Teacher classroom interactive behavior included classroom management, lesson development and materials use. While students mathematics performance included the last term examination results when they were in senior three S3, December, 2018 and secondary end of first term examination results, May 2019, when they were still in senior four S4.

1.7.3. Theoretical Scope

The study employed Albert Bandura's Social Learning Theory (1997) and Mead and Reynold's Symbolic Interactionism Theory (1994).

Social learning theory considers a bridge between behavior theories and cognitive learning theories because it encompasses attention, memory and motivation. Bandura sees that the power of interactive behavior is relative, where it can change depending on environmental factor. (Bandura,1997). Hence, the theory was chosen because it is related to the study, teacher classroom interactive behavior and students mathematics academic performance.

Symbolic interactionism theory is the theory that develops from practical considerations and alludes to people's particular utilization of dialect to make images and normal implications, for deduction and correspondence with others.

This theory adopts pragmatic philosophical though, it has a view that confirms the rule of reason and makes the mind a starting point to interpret all forms of human behaviour, to the extend that it goes to the existence of a collective mind is responsible for the unity of the behaviour of the group. (Ghaith, 1997)thus the theory was chosen whereas related to the students' teacher classroom interactive behavior and students mathematics academic performance.

1.7.4. Time Scope

The study covered information for the three years: 2015, 2016 and 2017 because during this time period it was when the selected public secondary schools experienced severe decline in the performance of students in mathematics. The timeframe for data collection covered only six months from February to May, 2019.

1.8 Significance of the Study

The findings of the study were beneficial to the following stakeholders:

The study may be of importance to mathematics subject teachers because it would help those who do not practice interactive teaching styles and behavior in their teaching to start doing so. In addition, the study will add knowledge on the body of literature on the contribution of teacher classroom interactive behavior and students' mathematics performance and will form a foundation for other scholar researchers on the same topic. Also, findings from this study will inform policy makers in order to strategize for mechanisms to improve student's performance in Mathematics in secondary schools as well as in other educational levels. And lastly, the findings will serve as baseline information to various educational stakeholders, including the Ministry of Education and Sports (MoE) on the teacher classroom interactive behavior and student's mathematics performance in public secondary schools so that they can devise immediate measures to improve students' performance in Mathematics not only in secondary levels but in all levels of education.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presented the theoretical review, conceptual framework, review of related studies done by others researchers which are related to the topics and the research gaps.

2.1 Theoretical Review

This study was guided by two theories first is Social Learning Theory. One of the main social learning theory by Albert Bandura (1997) which is based on the theory of personality. It is a type of synthesis between the theory of behavioral reinforcement and cognitive psychology (Ammar Al-fetiti,2017).

According to Bandura's theory, education depends not only on the model of knowledge and skills, but also expands to include the concept of emotions, feelings and how to express them. He posits that people learn from one another, by observation, imitation, and modelling. His theory has often been called a bridge between behavior theories and cognitive learning theories, because it encompasses attention, memory, and motivation. He referred to that the learning process it is nothing more than result of interaction between three main axes: behavior, environments and psychological processes. Thus, the social educational process that affects the personality of the human being is based on two mains axes. First main axe is contains four sub-axes: attention as in the used of models by the teacher that draws the attention of students in the classroom and this is what the researcher referred by the term classroom management .The second sub- axe is: Retention and holding, which in turn means that the student remembers something in a form, as in the use of the teacher, for example, a hand-made pyramid to bring the concept of angles beyond the triangle and This is what the researcher referred as teaching aids. The third sub-axe on which the learning process based by observation on is re-production, which means that our learning abilities are improved when we can imagine or actually participate in the situation or event, for example, the teacher should motivate the students to participate in the preparation of the lesson. And writing on the board during a part of the lesson time and asking imaginary questions, where that is part of the learning success process. And that's what the researcher referred by term lessons development.

The fourth sub-axis is motivation. That means no person will do anything except that he has motivation and here comes the role of the teacher in the application of the principle of reward and punishment has been explained by the researcher in detail also under the term development lesson. In Bandura's theory, the second main axis of learning is self-regulation and this is knowing as behavior, for example, when the teacher leaves the ego outside the classroom and has the courage in management and patience to receive the students' questions and organize their reactions according to the learning situation and the nature of the lesson then inevitably the learning process will yield positive results. On this basis, the theory was chosen because it's related to the study, teacher classrooms interaction behavior and student mathematics performance. (Ammar Al-fetiti, 2017).

Similarly, Walsh (2006) confirms that teacher social interaction and classroom behavior are not separated from the learning situation. The effective teacher classroom behavior, develops a clear system to handle difficult activities, such as mathematics, especially underage pupils in the schools, in most cases, most of them don't recognize the impact of such activity at times. The individual learns to understand the world, as a self -thought system, which are seen as having personal, social, and cultural importance. This supports Bandura view on the role of active participation and assistance provided by other members in the learning community. In addition, learning activity is supposed to be goal-oriented in situations that are authentic and meaningful in relation to the application of knowledge to be learned and this should be implemented by individuals, but not theoretical preparation (Slavin, 2006). Therefore, the theory is chosen because it is related to the study on teacher classroom interactive behavior which plays a crucial role on student's mathematics performance.

Symbolic Interactionism Theory by Bummer (1986) and George Herbert Mead (1994) is one of contemporary educational theories also which supports Bandura's theory. Interactive symbolism is one of the main axes on which social theory relies, in analyzing social patterns. It starts with the level of the micro units (micro), from which they begin to understand the larger units, meaning that they start with individuals and their behavior as an input to understanding the social pattern. The actions of individuals become fixed to form a structure of roles. These roles can be seen in terms of people's expectations of each other in terms of meanings and symbols, Here, the focus becomes either on social roles and patterns, on social behavior and action. Although they see social structures implicitly as role structures in the same way Parsons (1979) he emphasized that they do not occupy themselves with analysis at the level of patterns, as much as they are concerned with the symbolic interaction formed through language, meanings and mental images, based on the important fact that an individual must accommodate the roles of others, Then symbolic interactivity theory focuses on the study of interactive processes. (Talcot. Parsons, 1979) Each person has a special behavior of interaction, and he aspires to the desired responses from people and this is done in his own ways. Examples of interactive behavior are the speed of dialogue with others.

The dialogue learns the diverse patterns of behavior and has trends. He can organize his relationships with those who converse with them within Values, culture and social traditions. In addition that the individual's interactive behavior is not limited to a specific place. The individual interacts with family members and their community, sharing their joys and sorrows. This type of interaction takes place in the school with the students and with those who teach it.

The authors of the interactive theory begin their study of the educational system from the classroom (where the social act occurs). The relationship in the classroom, the students and the teacher is crucial because it is possible to negotiate the truth within the classroom. Students are aware of the fact that they are skilled, stupid or lazy. In the light of these statements, students and teachers interact with each other, where they ultimately achieve success or failure of education. (Herbert Mead and Reynolds, 1994).

The symbolic interactionism theory believes that the social life we as a individuals live in is only the result of interactions between humans, institutions, systems, and other organisms. These interactions are caused by the symbols that are individuals towards others after interacting with them. In the process of interaction between two or more individuals, this symbol may be positive, positive, hateful, and the nature of the symbol we make about people, groups, or things that determines our relationship with them or their relationship with us. The concept of the theory is based on two basic concepts: the concept of the ego, and the concept of interaction. The concept of the ego represents the psychological aspect who makes the meanings and that the absence of his behavior leads to the absence of meaning and that ego must bow and react according to the orders and society roles to achieve the meaning of the identity of ego. Accordingly, the researcher believes that if we consider that the actor here are the teachers and students in the school community and specifically the classrooms , the interactive behavior of the teacher and students and among each other either verbal or including behavior. As for interaction represents the social aspect, including communication and interaction.

The theory in its content includes that the actor as an individual in the society and he is the main engine which leads to failure or success the meaning .That meaning is the role of both student and teacher in the educational process. The student, when he wishes to maintain this sense, must accept and fulfill the role that the society imposes on him in the success of passing the examination of the educational subject which is the measure of academic success. And that is the concept of ego in the student. Indeed, the student's achievement of his identity or ego is what the researcher referred to as academic performance. And by the same path also the refers to the teacher. The identity of the person is related to his or her own ego and it is required to abandon part of this identity in accordance with the criteria of the community. So the interactive behavior of the teacher with his students must be different. For example, the teacher outside the school may founded as a normal person hears songs or even smoking but in the classroom it must be imposed on him His role as a teacher to interactive behaviorally by specifically, structured and planned method in terms of mastering classroom management skills, developing lessons and using materials. This is what the researcher referred to in the term of the teacher's" interactive behavior"

Similarly, Erving Goffman (1982) pointed out that symbolic interactionism in its concept includes society and actors. The actors represent two identities: identity of ego and identity of the other. Both are subject to the criteria of society, which requires them to maintain both identities through interactive behavior, which is through two means Either preview as a part of the context or directly (Erving Goffman, 1982).Goffman resembled the interactive behavior in the theory to the theater society and that the ego concept of the both teacher and student may become different when the completion of the representation of their roles on the stage and that The interactive behavior between the two identities may be influenced by many factors such as director, author, audience, script and other and intervening factors. The identity of the teacher be in his educational role and then he must abandon his ego as part of his personality outside the classroom to maintain the standards of the educational role through his interactive behavior which is represented in being aware of classroom skills, in terms of :classroom management, lesson development and material use. Similarly, the student must match his or her ego as student to the educational situation. The student should ask, participate, discuss and study hard to prove his success, satisfaction and fulfillment of his parents and his society role. This is what the researcher referred to under the term "Student academic Performance".

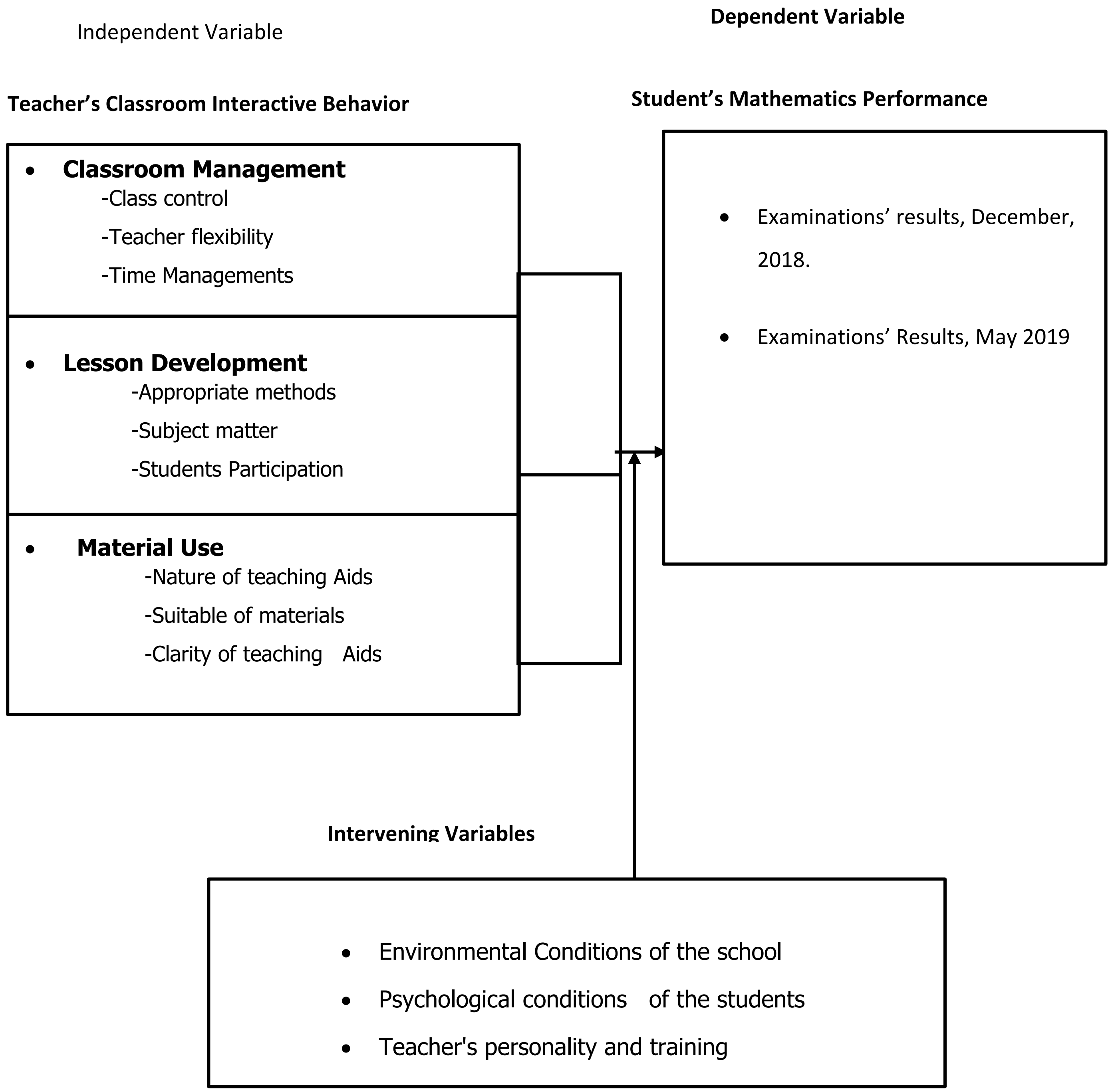
On the basis of the above, the researcher resembled the classroom as small part of the society to theater stage and the identity of the teacher be in his educational role and then he must abandon his ego as part of his personality outside the classroom to maintain the standards of the educational role through his interactive behavior which is represented in being aware of classroom skills, in terms of classroom management, lesson development and material use.

Actually, the concept of interactive behavior between the student and the teacher within the classroom is more extensive than being confined and limited to two roles ,the role of student and the role of the teacher to go beyond several factors that affect also on the interactive behavior such :condition of the school ,psychological conditions environment of the students and teacher’s personality and training (Haidar Hatem Faleh Al - Ajrash, 2016) (Janelle Cox, 2005).

According to the two previous sociological theories social learning theory by Bandura and symbolic interactionism theory by Herbert .Mead, the researcher chose the research subject: teacher classroom interactive behavior and students 's mathematics performance, attempting to link the two theories and their impact on the educational role of the teacher of mathematics during the classroom to be the beginning of give birth new theory (interactive behavior theory) at the next level of his preparation to PHD.

2.2. Conceptual Framework

This study was mainly concerned with teacher classroom interactive behavior and students' mathematics performance



Sources: Adopted from Wang, Haertel, and Walberg, (1993). Berk, (1988). Bropy, (1968) Xuehui An, Emily Hannum, Tanja Sargent (2007) and Abdul Gafoor and Haskar Babu (2012).

Fig.2.1. Diagram shows the relationship between teacher classroom interactive behavior (IV) and student's mathematics performance (DV) and the intervening variables which affect both IV and DV.

The above diagram (Fig. 2.1) shows the variables of the study. The independent variable, teacher classroom interactive behavior had three constructs. Classroom management which include class control, teacher flexibility and adaptability and time management. Lessons development includes appropriate methods, subject matter and student participation. Materials use include nature of teaching aids, suitable materials and clarity of teaching aids. The dependent variable, students mathematics performance was measured in terms of results of end of last term examinations, December, 2018 when they were in Senior three and secondary end of first term, May, 2019, in Senior four. While the intervening variables include environmental conditions of the school, psychological conditions of the students and teachers' personality and training.

2.3. Related Studies

2.3.1. Teacher's Classroom Interactive Behavior

We can not talk about teaching without talking about learning. We can not say that a teacher has taught a lesson. If this lesson did not have the desired effect on the pupils, Dewey expressed this idea when the teacher compared the seller and the seller's task to sell his goods to the buyers. If no one bought his goods, the sale could not be done (Kawther Hussein Kogak, 1997).

The teacher organizes the student activities in the educational process, and the latter has to possess a cognitive motivation. The teacher does all the necessary components and helps the student to assimilate them. However, without the student activity itself, there is no presence of the academic activity. The subject and the knowledge and the actions transform it so that concepts acquired in certain cases acquired a different content compared to what the teacher gave, and in order to know the student how to do the teacher must intervene in this process and not only the observation and the end result (Ahmad Khansa, Joe 2009).

Thus, we can say that education is a process of cooperation and joint activity between the teacher and the learner. Each has its complementary role. The teacher organizes his educational activity through daily communication and interaction with the student and through other material means. The learner responds with the effort of learning and his own experiences until the planned educational goals are achieved.

This is the concept of interactive behavior within the classroom referred to by the researcher in this study. There is no one, clear, universal explanation of how we learn or a subsequent guide book as to how we should teach. Rather, there are a range of activities teacher should pass through to teach (Simonsen, 2015). The most important factor affecting students learning is the teacher. If the teacher cannot manage the class, students will achieve inadequate progress academically. Effective teaching and learning cannot take place in a poorly managed classroom. If students are disorderly and disrespectful, with no apparent rules and procedures to guide behavior, chaos becomes the norm. Teachers struggle to teach, and students most likely learn much less than they should if teachers don't behave accordingly (Horner, 2002).A well-managed classroom provides an environment in which teaching and learning can thrive. However, a well-managed classroom doesn't just appear out of nowhere, achieving this takes effort to create and the person who is most responsible for creating it is the teacher.

Although positive behavior support systems are producing strong results for increased pro-social behaviors and decreased negative results in secondary schools, these systems are less often implemented in high schools (Horner, 2002). Secondary schools have tried to resolve classroom behavioral issues by: (a). repeating and restating consequences, (b). increasing the averseness of consequences, (c). Establishing a bottom line or zero tolerance level policies, (d). excluding students from the "privilege" of attending school through out-of-school suspensions and expulsions, (e). Offering alternative ways of completing the high school experience someplace else (e.g., alternative school, community college) (Sugai and Horner, 2002). Teachers' actions in their classrooms have twice as much impact on pupil's achievement as assessment policies, community involvement, or staff collegiality; and a large part of teachers' actions involves the management of the classroom (Marzano, 2003).

Classroom management is critically important in the middle grades years when students are more likely to experience declines in academic motivation and self-esteem (Anderman, Maehr, and Midgley,1999). Research indicates that these declines can be linked to the classroom, and particularly to teacher-student relationships (Furrer & Skinner, 2003). When surveyed about their goals, adolescents have claimed that academics and the completion of their education are important to them.

While, Metelot (1998) has explained the concept of teacher classroom behavior in different way. Patton (1990) regards the concept of classroom behavior as the chain of events that occur one after another, each occupying only a small segment of time. (Mbunda ,1996) defines classroom behavior as the logical relationship between teacher and students' behaviour on one hand, the teaching and learning resources and general classroom environment. The teacher (T), students (S), teaching as well as learning resources (R) and learning objective (LO) as the main element of teacher behavior. It also established that relationships in the classroom are the outcome of the events taking place in the classroom that are aimed at accomplishing some learning outcomes.

Metelo (1998) also defined classroom behavior as the process in which teachers and students have a direct interaction or have a reciprocal effect upon each other through what they say as well as do in the classroom. Classroom behavior is reflected by communication between or among students and teachers and the use of teaching and learning materials. (Plunders ,1970) argues that classroom behavior refers to the chain of events that occur one after the other in varying segments of time. The major role of a teacher in the classroom interaction behavior practice is to guide the student what to do in the classroom. Teacher classroom interactionbehavior means: teacher classroom management, lesson development and materials use during the interaction in the class and student's mathematics performance.

2.3.2 Classroom Management

Classroom management is the process by which teachers and schools create and maintain appropriate behavior of students in classroom settings. The purpose of implementing classroom management strategies is to enhance prosocial behavior and increase student academic engagement (Emmer and Sabrina, 2015). Effective classroom management principles work across almost all subject areas and grade levels (Brophy, 2006). When using a tiered model in which school-wide support is provided at the universal level, classroom behavior management programs have shown to be effective for 80-85 percent of all students. More intensive programs may be needed for some students one of the keys to effective classroom management is the development of a quality relationship between the teacher and the students in the classroom. Marzano, and Pickering (2003), in a meta-analysis of more than 100 studies, reported that teachers who had high-quality relationships with students had 31% fewer discipline problems, rule violations, and other related problems over a year's time than did teachers who did not. This significant statistic justifies further investigation into developing relationships.

On the other hand, George-Sugai, (2015) argue that a critical component of developing relationships is knowing and understanding the learner. Teachers must take steps to learn and understand the unique qualities of middle grades students, who are at a crucial time in their development. Although they are good at disguising their feelings, they have been described as actually craving positive social interaction with peers and adults; limits on behavior and attitudes; meaningful participation in families, school, and community; and opportunities for self-definition. According to Wormeli, (2003). teaching middle grades students is unique in its demand for unconventional thinking; therefore, middle grades teachers must be willing to break the rules and transcend convention. The strategies that describe the dealing with the most difficult of students are in many ways just that—unconventional. Students' prior experience and knowledge base and emphasize students' exploration and understanding. However, the trainee teacher's teaching should not be describe as mechanical. The expert mathematics teacher should have more pedagogical content knowledge than the novice teacher does.

Leaving the ego at the door of the classroom is perhaps the most valuable suggestion to offer along with showing empathy. Without this, however, empathy may never get a chance to emerge. Young adolescents closely watch the reactions of adults to see if they practice what they preach. For example, if Tom, a sixth grade student, erupts in class one day because he is being teased for being a "suck-up," a very typical teacher response is, "Just try to ignore what the other kids are saying." However, if a teacher or counselor tells a student to "ignore" the taunts or insults of another and then reacts angrily to being disrespected, the student, like most of us, will have little respect for what amounts to hypocrisy. Demanding respect is not as effective as earning it, and how the teacher comports himself or herself has much to.

Other essential elements for classroom behavior are students' characteristics such as intelligent quotient and the ability to respond to teacher's teaching instruction and students' ability to comment and contribute to the teaching process. However, it is important to note that the impact of these factors on classroom behavior and students' performance are not harmonious across scales. They differ considerably among schools. For dealing with the most challenging of students, teachers can learn and apply strategies used in the field of counseling and psychotherapy, such as building empathy, admiring negative attitudes and behaviors, and leaving one's ego at the door. It seems particularly important to provide specific strategies for dealing with what can often be the problems that prevent from persevering in the important work of helping pupils learn. In the area of classroom management, it is critical that teachers find ways of building relationships with all students, from the most motivated to the most difficult. To borrow the words of Rogers and Renard ,(1999), when we enter into understanding human needs and relationship-driven teaching, "amazing things can happen" .

Teachers who adopt a relationship-building approach to classroom management by focusing on developing the whole person are more likely to help students develop positive, socially-appropriate behaviors. The characteristics of effective teacher-student relationships are not related to the teacher's personality or whether the teacher is well liked by the students. Instead, the relationships are characterized by specific behaviors, strategies, and fundamental attitudes demonstrated by the teacher (Bender, 2003) This approach involves taking personal interest in students; establishing clear learning goals; and modeling assertive, equitable, and positive behaviors the most effective classroom managers do not treat all students the same. Effective managers employed different strategies with different types of students (Brophy, 1996).

Teachers with effective classroom management skills are aware of high needs students and have a repertoire of specific techniques for meeting some of their needs (Bender, 2003). Interaction between teacher and students is an essential part of teaching and learning. Teacher is the main performer in classroom. During classroom interaction the teacher's actions are critical, Sekwao (1998) argued that in classroom interaction the teacher's role is to direct students what to do and imparting knowledge. Meanwhile, Mtaturu (2011) also asserts that learning is greatly enhanced when there is active interaction between teachers and students.

Vygotskian notions of teaching and learning as assisted performance (Tharp and Gallimore 1988) or as a process of guided participation (Rogoff ,1990) believe that learning arises both as the result of planned guidance of the students by a more competent one and, incidentally, through taking part in cooperative activities within the learning community. For example; Palincsar and Brown (1984) remark that in effective teacher's behaviors and learners in a small group task, reciprocal teaching is based on four different strategies which are associated with text comprehension; questioning, clarifying, summarizing and predicting. This highlights the role of both teachers and learners in collaborative learning. While Walsh (2006) maintains that teachers should play a central role in mathematics classroom and states four main responsibilities for teachers: time spent against each item in the class, attention given to learners, monitoring learner's abilities, repair strategies and modifying speech to learners.

According to Simonsen (2015) teachers control both the topic of conversation and turn taking, and orchestrate the whole interaction process to facilitate learning. Eliciting the information through referential questions which have natural and communicative responses is one of the teacher's duties. Repair depends on the teacher’s goal, whether he is focusing on fluency or accuracy. Modification is fundamental because it is the link between comprehension and mathematics progress and illuminate the modes of teacher participation during whole -class discussion (Kumpulainen and Wary, 2002).

While Swain (1985) argued that output enhances fluency and promotes ‘noticing’ by allowing learners to identify gaps between what they want to say and what they are able to say. She stressed that an understanding of learning processes can be developed by using unfolded dialogues as the unit of analysis of language learning. This dialogue has to be monitored by the teacher who plays a scaffolding role and a facilitator of students’ contribution. Teachers can give their students control on the topic rather than the activity in a bid to maximize opportunities of both practice and acquisition. Discussing Swain’s ideas regarding output leads us to explore Krashen's input hypothesis.

Various studies such as that conducted by Flunders (1970) revealed the presence of mathematics teacher’s dominance in classroom discussions. A study on exploration of behavior of teachers in relation to behavior of students during classroom interactions. The author dealt with high school students in Britain and it was observed that direct contribution is applied by the teacher in order to defend her/his position. Studies on classroom behavior have also been conducted in Tanzania. For example, the study conducted by Katunz (1992) and Mbunda (1996). The study covered a sample of primary schools in five regions such as Tanga, Mbeya, Dar-es-salaam, Dodoma and Morogoro. The study investigated classroom interactive behaviors in science, English, Geography and Mathematics classes. The result revealed that most of the time teachers used teacher centered approach.

Teachers can improve students’ abilities in mathematics by increasing classroom interaction among students and provide the recommended behaviors with ample opportunities to practice in authentic ways within collaborative groups.

2.3.3 Lesson Development

Lesson development is the proper practicing of learning activities which presents a complete picture. It is a systematic implementation of subject matter. Lesson development is one which involves a series of learning experiences that are linked to achieve the aims composed by methodology and contents (Wong, 2016). Lesson development is a practical organization of various activities, experiences and types of learning around a central problem or purpose developed cooperatively by a group of students under a teacher leadership involving planning, execution of plans and evaluation of results during the class time Sugai (2015).

According to Khan (2007) in his study compared pedagogical content knowledge of one expert mathematics teacher and that of one trainee teacher at elementary school level in Mainland China. They found that the expert teacher knew students' prior learning experience, knew similar topics related to the teaching topic, and could flexibly use both in practice. However, the trainee teacher did not possess similar qualities. It was also found that the expert teacher knew students' problems and difficulty well and could make relevant preparation before the lesson and implement them in the class on lesson development for these while the trainee teacher could not do so. For effective lesson development the teacher needs to put in mind the capabilities, interest of the learner should be considered, Prepared on the sound psychological knowledge of the learner, Provide a new learning experience; systematic but flexible, sustain the attention of the learner till the end, related to social and physical environment of the learner and development of learner's personality.

The difference between lesson plan and lesson development is that, lesson planning is a thinking process, not the filling in of a lesson plan template. Lesson plan envisaged a blue print, guide map for action, a comprehensive chart of classroom teaching-learning activities, an elastic but systematic approach for the teaching of concepts, skills and attitudes (Wong, 2016). Whereas, lesson development is the implementation of the plan into action during the class time.

Lesson development is pertaining to preparing and motivating students to the lesson content by linking it to the previous knowledge of the students by arousing their curiosity and by making an appeal to their senses. This prepares the child's mind to receive new knowledge. "To know where the students are and where they should try to be are the two essentials of good teaching." Lessons may be started in the following manner: (a). two or three interesting but relevant questions (b). Showing a picture/s, a chart or a model (c). a situation statement of aim: announcement of the focus of the lesson in a clear, concise statement such as "Today, we shall study the..." (Sugai,.2015). In the actual lesson development, the behavior of teacher is essential; this step should involve a good deal of activity on the part of the students. The teacher take the aid of various devices such as questions, illustrations, explanation, expositions, demonstration and sensory aids, etc. Information and knowledge can be given, explained, revealed or suggested. (Wong 2016).

For Mathematics, the following principles should be kept in mind: Principle of selection and division: This subject matter should be divided into different sections. The teacher should also decide as to how much he is to tell and how much the pupils are to find out for themselves. Principle of successive sequence: The teacher should ensure that the succeeding as well as preceding knowledge is clear to the students. Principle of absorption and integration: In the end separation of the parts must be followed by their combination to promote understanding of the whole. It is always desirable that new ideas or knowledge be associated to daily life situations by citing suitable examples and by drawing comparisons with the related concepts. This step is important when establishing principles or generalizing definitions. (Wong,2016). This concept is concerned with the systematizing of the knowledge learned. Comparison and contrast lead to generalization. An effort should be made to ensure that students draw the conclusions themselves. It should result in student's own thinking, reflection and experience (Simonsen, 2015).

In peer interaction, turn taking and the choice of content is spread amongst the students. (Rommetveit, 1985). Prepared tasks of group work usually results in extensive negotiation of meaning. In this respect, it contrasts with the teacher – fronted instruction where typically little interactional modification takes place.

Students who have the responsibility for managing their own talk must cope with silences, negotiate how, when and who talks, and assess the relevance and quality of communication (Barnes and Todd 1995). Consequently, lesson development among students is usually complex and dynamic in nature. The extended opportunities for using language and participating in classroom interactions seem to give student simple opportunities for joint meaning-making and knowledge construction. Yet, the dynamic nature of interaction in peer groups also poses new challenges and responsibilities for students engaging in productive classroom communication and learning.

Working collaboratively in groups is reported to help students to construct and increase awareness of their own thinking processes. In other words, students share their views and perspectives with others and can discover divergent ways of solving problems. Moreover, they can build on each other's contributions to re-construct new interpretations and views that were yet to be discovered. The practice of sharing and constructing perspectives in collaborative interaction is also assumed to be more emphasized. (Pressley, 2000). Micro-level analyses of the lesson development process inherent in learning groups have shown that focus on completing the task rather than engaging in joint reasoning problem solving. In these learning situations, learners are likely to be product oriented, in which individual problem solving may play a bigger role than that of cooperative meaning-making. (Kumpulainen and Mutanen, 1998).

Efforts to improve the lesson must focus on the single most important component: the classroom teacher (Ingwalson and Thompson, 2007). Teachers in middle level schools must be well prepared to face the challenges of working with young adolescents; and critical components of teacher preparation are the knowledge and skills from education and related fields that enable them to develop effective, and often unconventional, management systems in their classrooms. This effort must begin with a new paradigm in which teachers view classroom management as an ongoing exercise in building relationships.

When students question of being non-compliant or engaging in disruptive behaviors, they may easily trigger an emotional reaction from the teacher. For example, Sammy, a seventh-grade student, might say, "Why should I listen to you? You're just a middle school teacher. Why don't you have a good job?" The unexamined response that a teacher might give is this: "You have no right speaking to me like this. I know a lot more than you do, and I know you have detention today. See me after school." All that cannot come if the lesson was developed well. (Ellis, 2005). Because teachers do have authority and certain privileges afforded to them by their position, anger and frustration often lead to the abuse of power in punitive ways. This usually happens when the adult does not take the opportunity to examine his or her own vulnerabilities on a regular basis. When the disruptive adolescent repeatedly insults or disobeys the teacher, the teacher's ego takes over, demanding respect. (Wong, 2016).

Students do not always engage in giving arguments, making, providing explanations and elaborating or hypotheses justifying their actions or views through their verbal interaction. Students may use imprecise language when communicating their views to their peers. All these elements challenge the reciprocity between interaction members that is, apparently, necessary for collaborative meaning-making (Ellis, 2005). Learners need to participate in the discourse of the lesson. The involvement can be, among others, in the form of speaking, listening, thinking, be listened to. Actual cognitive conflict occurs more easily when students do not feel the pressure of an authoritative figure. In this case, mathematics teacher, besides, learners cannot get enough practice just by listening to the teacher and very little talking from students. Therefore, lesson development has to inter students’ discussion for the free flow of ideas (Howie and Plomp, 2000).

When a teacher is self-aware of vulnerabilities, such as the need for power, he or she is more likely to respond strategically rather than emotionally. For example, a teacher who knows he is sensitive to students questioning his authority can anticipate that middle grades students will, in fact, question his authority. Such awareness can lead to the use of empathy or the admiration of negative behaviors, as previously discussed. In essence, the key to leaving one's ego at the door is awareness.

2.3.4 Materials Use

Teaching secondary school classroom may be regarded as a challenge for teachers accustomed to teaching without learning aids; therefore teachers should require the basic characteristics of effective teaching. The use of educational materials makes learning and comprehension easier for students at all levels. Instructional materials include textbooks, teacher's guides, reference books, software materials, charts, and different models are the basic elements, second to teachers, in learning. They provide organized information in terms of scope as well as sequence of what the students have to learn in a particular level of education.

On the other hand, Omari (2001) pointed out that in order to encourage all students be both involved in the discourse, and prepared to be contributing members of a class, the classroom community should be shaped by activities designed to encourage students to interact in a non competitive manner. However, the study conducted by Katunzi and Ndalichako (2002) revealed that, there was inadequacy of instructional materials for science subjects, mathematic subject inclusive. Since instructional materials simplify the facilitation of teaching and learning process then their inadequacy is likely to affect students' participation in learning activities. All these actions (verbal and non-verbal actions) are conducted in the classroom in order to improve teaching and learning environment. In particular, the environment in which teaching and learning of the mathematics subject take place needs to be made conducive so that every student can concentrate and participate.

Students and materials stimulate knowledge and learning. The interactions should not only promote a high rate of interest of students learning mathematics but also provide opportunity for active participation. Ifamuyiwa (2008). According to Howie and Plomp (2000), teachers need also to emphasize students' responses, knowledge and information that have instructional significance. The class instrument assesses three broad domains of effective interactions; emotional support, classroom organization, and instructional support that characterize students' classroom experiences in grades. Each domain is comprised of multiple dimensions of effective interactions known to contribute to students' success in school, such as teacher sensitivity, behavior management, and quality of feedback. Classrooms conclude that in grades, students in classrooms with proper materials ratings realize greater gains in achievement and social skill development.

The link between effective use of teaching aids by a teacher during the lesson improved social and academic outcomes for students of elementary years, unfortunately, too few schools in developing countries are exposed to these types of modern materials in the early education. Thousand primary school classrooms throughout the country, students tend to experience moderate material use by teacher during interactions or none which diminishes student emotional support and classroom organization. However, most secondary students' classrooms characterized by very low levels of material support

Adolescents in middle school and high school characterize their interactions with teachers as frequently unsatisfying and unmotivating. They report that their experiences in the classroom lack meaningful challenges, supportive relationships, and competence- and motivation-building experiences. Yet, engagement and intrinsic motivation are pivotal in adolescence, as these students have the means to not only withdraw energy from educational pursuits but to drop out altogether. Engagement in school begins to decline early in adolescence, and by entry into high school this decline is so pronounced that half of high school students report that they do not know what a teaching aid is or even a text book which make them not take their school or their studies seriously and therefore low achievement in academics.

Studies of large-scale testing programs indicate that teachers are the greatest source of variation in what students learn in school. The class secondary version observation tool captures aspects of classroom interactions researchers believe to be critical resources for educational achievement in adolescence. The teacher is responsible for the materials, the type of interaction and the management of speaking turns. Interaction between the elements during teaching and learning is one of the most important factors in students' performance (Mbunda, 1996).

According to Kiwia and Odada (1991) learning is greatly enhanced when there is active participation and interaction between a teacher and students. The more students are involved in various tasks, the more competent they become when it comes to performance. Thus, in learning mathematics in secondary schools, active participation and interaction between teachers and students is required for good mathematics outcomes.

2.4 Students Mathematics Performance

Performance is one of the concepts that is used in this study. It is the act or style of performing a work or a role before an audience, or the way in which someone or something function. While, Sichizya (1985) conceptualised performance as the ability of students to demonstrate what they know about the curriculum content, and also what they can do with what they know. Further stated that performance measures what students have learned and how they are able to use what they have learned.

Mathematics as a formal area of teaching and learning was developed about 5,000 years ago by sumerians (Mariki, 2009). Since its inception, mathematics has been a powerful tool for developing the faculty of knowledge and therefore a pre-requisite for many other disciplines (Mrimi, 2005). Potentials of mathematics have been also reflected through the fact that all sciences require Mathematics; and it is one of the easiest sciences because no one's brain rejects it whether laymen or semi-illiterate they know how to count and record.

National Council of Teachers of Mathematics (NCTM), (1989), acknowledged that mathematics enables people to mediate and to be able to develop a sharp way of thinking as one cannot do mathematics without reasoning; and its techniques provide very scientific and cheap way of analysing and solving various problems that we face in our day to day living. It enables students to be rational, critical thinkers engaged in logical processes and conjectures in a variety of ways. The subject fits in groups of many subjects for example there is Mathematics in Geography, biology, accounts and economics. Mathematics plays a significant role in science. Just as the language of true literacy not only specifies and expresses thoughts and process of thinking but also creates them in turn so does mathematics not only specify, clarify and make rigorous workable concepts and laws of science, but also at certain crucial instances it becomes an indispensable constituent of their creation and emergence as well (Bochner, 2007). This plainly entails that mathematics is a fulcrum in which other subjects can rotate and find their being (Mariki, 2009).

The problem of low performance of secondary school students in Mathematics is partly the result of where formal Mathematics curriculum was adopted (Naom, 1998). This was a result of the scientific revolution that began in 18thcentury, in Britain and spread to other European countries and beyond as a result of colonialism in 19^{th} century. However, most countries which were under colonial rule were not given the opportunity of scientific education and modern Mathematics.

In United States of America (USA), for instance, public education did not go beyond primary grades until the end of 19th century. Private academies especially for women were established in the late 1800s to provide the necessary education for admission to the universities. However, few universities admitted women although there were some institutions such as Smith College that was designed specifically for women (McGrayne, 1993 cited in Naom, 1998). Female role models were therefore missing from universities well into the mid 20th century. In the early 20th century few females could be university teachers but were prohibited from doing scientific research. Their positions were in what were considered gender departments such as home economics or physical education. Thus, lack of role models in Mathematics field came to contribute to negative attitudes towards Mathematics among girls (Naom, 1998).

In Germany, there were no Mathematics female teachers until 1920s. Also, women worked without being paid. Even today women are few in highest rank of German professoriate. There is also disapproval for women who worked outside the homes (Naom, 1998).Experiences from Tanzania show that during the pre-colonial period the purpose of learning Mathematics was to equip members of society with mathematical tools which were necessary for the day to day needs of the indigenous people (Mmari, 1995). Traditional Mathematics was based on four numerations of addition, subtraction, multiplication and division. Modern counting techniques were introduced by the Arabs before the coming of Europeans. They established Koranic schools in the trading centres in which no doubt, basic knowledge of reading the Koran was provided together with elementary mathematical skills (Howie and Plomp, 2000).

Colonial administration introduced formal education in Tanzania. Colonialism did not promote modern Mathematics as well as science education. Rather colonialism trained a small number of Africans and mainly males to carter for semi-skilled manpower requirements (Howie and Plomp, 2000).

2.5 Intervening Variables

Mathematics teaching and learning is of crucial importance. This is to both individual and the country at large. However, most of classrooms are missing the interactive behavior hence the students are not willing to study the subject. As it was revealed in this study, there are several factors work to trigger or discourage the classrooms interactive behavior and students performance , these includes : basically poor knowledge they received during primary education, lack of teaching and Learning materials, teachers' pedagogical competence, teacher's teaching style, abstractness of mathematics subject, students' negative attitude towards the subject that it is very difficult, poor learning environments ,the social structure of the classroom and the homogeneity in the social structure of the school and other several factors that the researcher summarized them under three main factors : environmental conditions of the school, psychological conditions of the students and teacher's personality and training.

2.6 Environmental Conditions of the Schools

A positive school climate is an important component of successful and effective schools and thus is often an aim of school wide initiatives. Climate has traditionally been conceptualized as a school-level factor and is often assumed to be related to other school-level factors such as: school size, faculty turnover, classrooms size, the number of classrooms in it, the classroom capacity, the location of the school, school facilities, school administration, and the psychological atmosphere prevailing in the school. (PsycINFO Database Record, 2016 APA)

As well as linked to the school environment effectively learning in terms of the availability of educational equipment and tools related to learning materials can not be mathematics teaching properly, for example, without the presence of the Retinal whiteboard or math set tools such as protractor and ruler, compass geometric set and other math tools which are helping students to understanding of mathematics lessons hence well performance in mathematics

In addition, there is a relationship between the student and the school whereas the school plays an important role in building the character of the student, and therefore can be considered as the main factor leading to the success of the educational situation or failure, and the school atmosphere is one of the most important factors affecting the student's achievement is often felt the student in the school in awe in the face of new colleagues and those responsible for the process.

As intelligence is one of the most important factors affecting the achievement of school, and therefore the low IQ of the student leads to a delay in the study of general studies have shown a correlation between the weak intelligence and delay in school (Armstrong, 2003).

2.7 Psychological Conditions of Students

Students are the most important input to the management of the teaching and learning environment. They are the most important inputs to the educational process. Without students, there is no class. There is no education and schoolchildren of different ages. According to their age, education is divided into stages. Teaching and learning requires the teacher to stand on all aspects related to pupils in terms of their development and learning (Ahmed Ismail Hajji, 2000).

When we talk about it, we refer to the psychological characteristics of the child to his age (child or adolescent), sex (male or female) and all factors affect our understanding of this individual, the learner when entering the classroom carries with him ideas raised and developed by hard It is necessary for the educational process to succeed in taking into account all the psychological, cognitive and social aspects of this learner so that our efforts do not go away. According to Piaget, knowledge is acquired if it is linked to prior knowledge. Learning will only take place if it is integrated into a network of cognitive skills, The learner holds perceptions that will not be easily abandoned to He obtained it through his social interactions and his living environment. All education has become a focus that in every learning must take into account the perceptions in the mentality of the student and in his knowledge system. Pedagogy must analyze the nature of misconceptions to overcome learning barriers (Laurence Cornu, 1992).

The characteristics of the students are the most important factors determining the effectiveness of learning and classrooms interactive behavior because the learners differ from each other in the level of mental abilities and mobility and physical characteristics and differ in their values and trends and trends and the integration of their personalities in addition to that they differ in their experiences prior to their affiliation to different social and economic classes.

2.8 Teacher's Personality and Training

The teacher in the educational system is a link between the student and the desired achievements, which plays an important role in the collection process, and encourage the student to learn. An efficient and successful teacher is the one who can push the student to learn and to cultivate, plowing and harvesting the material to the students , as the opposite may occur if the teacher is indifferent or incompetent in his material.

Some researchers believe that the drawing of any development plan can not achieve its objectives no matter what conditions and possibilities are available if there is no efficient teacher who has the best development in all respects, and in the case of reverse development process the result will be doomed by failure.

As the teacher's influence is not limited to the efficiency of the student only, but extends to what he learns. The effectiveness of learning is influenced by the intelligence, values, attitudes, tendencies, behavior and personality of the teacher. In addition, there is a continuous interaction between the behavior of the student and the teacher and this interaction affects the results of learning where the personality of the intelligent conscious teacher linked to effective teaching methods based on the basis of successful interactive behavior during the classroom. Actually, that's what mathematics subject needs is really.

The notion of style refers to a person's preferred way of using his/her abilities. Style, Ebel (2012) argued, about the concept of style was "what one is". Teaching is a performing art. Excellent teachers use their voices, gestures and movements to elicit and maintain attention and to stimulate student's emotions. Like other performers, teachers must convey a strong sense of practice, of highly focused energy. Our teaching style represents those enduring personal qualities and behaviors that appear in how we conduct our classes. While many people have argued that style is important in teaching, identifying the elements of our styles as teachers has proved to be difficult. According to Trowbridge and Bybee (1996), the assumption underlying teaching style is that it is the most effective and efficient means of presenting the material as long as the style is appropriate for the subject and the students. Teaching styles develop understanding, skills, and values relative to the mathematics subject. (Abdul Gafoor, 2012).

The educational role of the teacher in effective pedagogy is to help pupils acquire their own knowledge. The teacher before being specialized in his job is an engineer in education and technical in learning. It is true that the information he holds is not in vain, but since he works to earn the students independence, More as a consultant or specialist in the curriculum than knowledge, and be aware of the dynamics of the group, and controlled in the reactions so as not to fall on the section, the teacher to give up the dominant role in the section, not impose knowledge, it is important to work on the personal growth of students and progress They have a touching hand A couple of caters without forgetting the transfer of the identifier (Michel Minder, ibid, P 138-212) for K. Rogers The main task of the teacher is the ability to create an appropriate mental and emotional atmosphere in the classroom, atmosphere of psychological .As well as in mathematics due it is a deep material then it needs a successful teacher, specialized trainee to be the focus of the successful interactive behavioral process which leads to success the student in his performance in mathematics.

Classroom genuineness in mathematics at public secondary school is supposed to be taught by diploma and graduate teachers, the diploma being a minimum qualification. Diploma teachers are expected to teach Forms senior One and Two, while graduate teachers are expected to teach Forms senior three and four. In practice, however, this is not the case as there are presently more diploma teachers than graduate teachers in schools.

Diploma teachers are also teaching mathematics in Forms three and four and in some schools there are no graduate teachers at all. Furthermore, a considerable number of the diploma teachers lack substantial knowledge in terms of subject matter knowledge and teaching skills. They are unable to teach well topics they perceive as difficult and this on the other hand results in students" weary into listening of whatever the teacher is doing in the class and therefore increasing their negative attitude towards the subject. 2MOEC. (1997), cited in Kitta (2004).

2. 9 Research Gaps

There have been a number of studies conducted on the teacher classroom interactive behavior and students mathematics academic performance in public schools in Uganda such as: Harriet Nannyonjo (2007) ,Clares.Iee, Suejohnston-Wilder and Rebertward-Penny (2013) and (Ndungo Issa,BiiraMajum,2018)but there's no study has been conducted in public secondary school in Makindye Division. This study was conducted in Makindye Division.

Most of studies conducted used quantitative approach such the one with the support of the Bill and Melinda Gates Foundation, The Measures of Effective Teaching (MET) project was created to develop and test multiple measures of teacher effectiveness (MET,2010).

Although, there are few studies pointed out the related studies using quantitative and qualitative approaches such :"The Quality of Education in Uganda": A Case of Iganga and Mayuge Districts (May 2016). Data collected To measure achievement, P3 and P6 students completed English and mathematics tests. And another study on "Perceptions of Secondary School Mathematics Teachers Towards Science and Mathematics Teachers (SESEMAT) Program in Mbarara District , Uganda" by Henry

Ampeire Karissa .But there is no study conducted using both quantitative and qualitative approach for a purpose of teachers classroom interactive behavior and students' mathematics performance in public secondary schools in Makindye Division. This study employed a mixed method because its appropriateness in the nature and its data collection tools which allow the researcher to infer only about that which she or he is examining (Borkan, 2004).

In addition, the theories employed in this study is different from other theories used by other researchers where the researcher linked between two different theories, one is social leaning theory and other is psychological theory in an attempt to build the idea of the beginning of a new theory, there is no study under taken that in public secondary school ,Makindye division, Uganda. Hence this study covered this gap.

CHAPTER THREE
METHODOLOGY

3.0 Introduction

This chapter presents research design, target population, sample size, sampling procedure, research instruments, validity and reliability of research instruments, data gathering procedure, data analysis, ethical considerations and limitations of the study.

3.1 Research Design

The study employed descriptive correlational design. Correlation was used to determine the relationship between teacher classroom interactive behavior and students mathematics academic performance. The researcher used both qualitative and quantitative approaches. This method was good at providing a better understanding of the research problem. Quantitative approach was used to capture the magnitude of the study that is through percentages and frequencies. Quantitative data was collected using instruments like questionnaires and observation checklists to answer the research questions .Qualitative approach was used to get the in-depth information from the respondents .In qualitative data the researcher used open- ended questions through interviews.

3.2 Target Population

The target population of this study were all the senior four students and all the teachers of mathematics from all the four public secondary schools in Makindye division, Kampala Uganda. the target population was 993 respondents, which included Kibuli secondary school (360 students), KCCA seed secondary school (251 students), St. peters Nsambya secondary school (220) and St. Denis Ssebugwawo secondary school Ggaba (150 students) and 12 mathematics teachers in those selected schools.

3.3 Sample Size

According to Mugenda (1999) a sample is the smaller group obtained from accessible population, each member or case in the sample is referred to a subjects sometimes the terms interviewees or respondents is used. Slovene's formula was used to compute for the sample size. Table 3.1 has the data.

Table 3.1. Target Population and Sample Size

Respondent Category	Population	Sample size	Sampling Technique
Mathematics teachers	12	12	Purposive sampling
S4 students	993	212	Systematic Random sampling
Total	1005	224	

Source: Makindye Division Education Office 2019

3.4 Sampling Procedure

Purposive sampling is a design to qualify the subject utilizing inclusion criteria. Those who qualify in the criteria will compose the specific population of the study. Purposive sampling was used to choose respondents such as mathematics teachers with the following inclusion criteria; (a) had to be mathematics teacher teaching senior four students, (b) was teaching mathematics in senior three last year and was also teaching senior four this year (2019). Systematic random sampling was used to select the students. The researcher selected after a participant every after a given interval.

3.5 Research Instruments

The researcher used three types of research tools to gather data from the respondents; (a). Self-Administered Questionnaire, (b). Observation- Checklist and (c). Interview guide.

3.5.1 Self-Administered Questionnaire

A questionnaire is a set of questions intended to collect data from the respondents. The questionnaire was used to collect data from senior four students about the classroom interactive behavior of their teachers. The questionnaire had two sections which included, section A, the face sheet to get the demographic characteristics of the respondents and their teachers which included 8 items, 3 of them about students and 5 of them about their mathematics teacher. Section B is about teachers' classroom interactive behavior which had 29 items and divided into three parts; questions on classroom management, lesson development and materials use. The questions were closed ended and based on four point Likert scale, with the following response modes; 1= strongly disagree, 2=disagree, 3=agree and 4=strongly agree.

3.5.2 Observation Checklist

The observation checklist was also used to collect data on actual teachers' classroom interactive behavior that was used by the researcher and her supervisor to observe the classroom interactive behavior within the class. the observation checklist composed of 34 items which captured the actual teachers' interactive behavior actions within the classroom. it is consist of three parts, first part had 15 interactive behavior action related to classroom management, second part had 13 for lesson development, and third part had 6 which were related to material use.. This data was used to supplement the data collected using a questionnaire.

3.5.3 Interview Guide

The interview guide was used to collect data from teachers of mathematics and the heads of department from each school. It is composed of 15 items which validate the responses of the students in the questionnaires and add more information's which might be missing in the questionnaire but very important in the study.

For the data on students' mathematics performance, it was collected using a record sheet. This data came from the test scores results of end of term examinations for last year when they were in Senior 3, December, 2018 and end of first term, May 2019 in Senior 4.

3.6 Piloting the Study

The researcher conducted a pilot study in secondary schools within the Division. This pilot study was aimed at getting current ground facts on students' and teachers' populations from the targeted schools. The pilot study also helped the researcher to make arrangements and agree on schedules of class room observation with mathematics teachers. Piloting also helped to determine the validity and reliability of the researcher instrument and also allowed familiarity with the instruments. The pilot study was also used to identify any items in the instrument that was ambiguous or unclear to the respondents and changes them effectively (Bell, 2005). During the pilot study, permission from head teachers to conduct the study within their schools were sought.

3.7. Validity of Research Instruments

The research instruments were subjected to the different experienced lecturers to test them. The researcher with guidance from the supervisor estimated the degree of adherence of the responses for each instrument. The validity was computed using the content validity index, from the following formula:

$$CVI = \frac{86}{92} = 0.93$$

Therefore, the instrument was valid since the CVI was 0.93 which was above a minimum CVI of 0.70 to declare the instrument valid (Amin, 2005).

3.8 Reliability of the Research Instrument

Reliability measures the extent to which an instrument consistently yielded the same result after being administered severally to the same responded (Bell, 2005). The research instruments were pre-tested to assess its reliability. The researcher used test-retest reliability to compute the reliability. The instrument was given to the respondents who were not the respondents of the study to answer the questionnaire. After one week, the same questionnaires again were administered to the same respondents. The Cronbach alpha was used to test for reliability of the instrument. A Cronbach alpha coefficient of 0.70 was used to declare the instrument reliable (Amin, 2005).

Reliability Statistics

Cronbach's Alpha	Number of Items
.934	92

Therefore, the instrument was reliable since the Cronbach's Alpha value was .934 which is above the minimum value which is 0.70.

3.9 Data Gathering Procedure

An introductory letter was obtained from the College of Education, Open, Distance and E-Learning. The letter was presented to the Head teachers of the different public secondary schools in Makindye Division where the study was conducted. The researcher met the Head of Mathematics Department as well as the different mathematics teachers to get the schedule of classes. (see appendix for the schedule). The researcher administered the questionnaires personally to the students. The researcher with her supervisor observed the teacher while teaching. And the teachers were interviewed after the class in a place convenient to them.

3.10. Data Analysis

Data was collected, coded and entered in computer. Quantitative data was analyzed using frequencies, percentages, means and standard deviations. Pearson Correlation Coefficient was used to establish the relationships between variables at 0.05 level of significance. Multiple regression was used to determine which of the variables directly affect the students mathematics performance with the help of SPSS computer software Program. Qualitative data was analyzed and presented thematically in line with the objectives and study variables.

3.11. Ethical Considerations

Authority to conduct the research was sought from the relevant authorities. The researcher also assured the key parties involves that the information gathered was treated with utmost confidentiality and only was used for academic purposes. The anonymity of respondents was secured by not asking for specific demographics of the participants such as names. Informed consent were sought from the participants by first informing or explaining to them the purpose of the study before being requested to participate and it's only those that were willing to participate in the study.

3.12. Limitations of the Study

Extraneous Variables: This was beyond the control of the researcher such as honesty and personal biases of the respondents.

Instrumentation: The research instruments were researcher made. However validity and reliability tests were done to arrive at reasonable measuring instruments.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

4.0 Introduction

In this chapter, the researcher presents results from data analysis and then interprets them, following the study objectives. The analysis was done using the Statistical Package for the Social Sciences (SPSS) software. The chapter begins with a presentation of the results for the demographic characteristics of respondents, then description of the dependent variable and finally the findings based on the objectives of the study.

4.1 Demographic Characteristics of Respondents

Respondents in this study included the senior four students and teachers of mathematics in the four public secondary in Makindye Division Kampala Uganda. Through closed ended questions of the questionnaire (Part A), respondents were asked to provide their personal information, to ensure their easy categorization. Their responses were summarized using frequencies and percentage distributions as shown in tables 4.1 to 4.6;

Table 4.1: Gender of Respondents

Categories of Gender	Students		Math's Teachers	
	Frequency	Percent	Frequency	Percent
Male	351	54.6	513	80.4
Female	292	45.4	12	19.6
Total	643	100.0	525	100.0

Source: Primary Data (2019)

According to the results in Table 4.1, most students in senior four (54.6%) were male as compared to females who were only 45.4%. This suggests that there are more male students in senior four as compared to females. In the same way, the biggest number of math teachers were male (80.4%) as compared to female staffs (19.6%). This indicate that there is still a very big gender difference in the performance of mathematics in general.

As regards to age, results in table 4.2A indicates that most of the students in the four public schools were aged between 15-18 years (94.1%) followed by those between 19-21 years (5.3%). Only 0.6% were between 22years and above that. This was not surprising since most students at that class level are in their teenage age (13 - 19).

Table 4.2: Age of the Respondents (students)

Age groups	Frequency	Percent
15 - 18 years	601	94.1
19 - 21 years	34	5.3
22 years and above	4	.6
Total	639	100.0

Source: Primary Data (2019)

As for the age of math teachers, responses from students indicate that majority (52.3%) don't know their teachers' age, while 26.8% believed that their math teacher's was aged between 20-39 years, followed by 18.6%who believed that their math teacher was aged between 40-59 and only 2.3% believed that their math teacher was 60 years and above. This suggests that most math teachers are quite young people aged between 20-39.

Table 4.3: Age of Teachers

Age groups	Frequency	Percent
20 - 39 years	167	26.8
40 - 59 years	116	18.6
60 years and above	14	2.3
I don't know	325	52.3
Total	622	100.0

Source: Primary Data (2019)

Though such teachers are energetic and bright, they may have inadequate experience in relating and handling students in a better way that can encourage them love mathematics. With respect to math teachers' qualification, measured in terms of education level, results in Table 4.3 indicated that, most of the students did not know their math teacher's education level (over 86.8%), an indication that may show that the interaction students have with their teachers is not adequate.

Table 4.4: Teachers' Educational Level

Education levels	Frequency	Percent
Diploma	6	1.0
Degree	48	7.7
Masters	28	4.5
Don't know	538	86.8
Total	620	100.0

Source: Primary Data (2019)

As for the results in Table 4.4, it is indicated that only 7.7% indicated that that their math teachers were degree holders, 4.5% believed they have masters degree and only 1% knew that their teacher had a diploma. Concerning years current math teacher had spent teaching the student, results in Table 4.4 indicated that majority had spent up to 3years (37.0%) being taught by the same math teachers, followed by those who had spent 2years (36.4%), while those of one year were also a considerable number. This bears an indication that math teachers in these schools last relatively longer and that they are not frequently changed.

Table4.5: Years Spent in Present Position

Years current math teacher had taught a student	Frequency	Percent
1 year	160	26.6
2 years	219	36.4
3 and above years	223	37.0
Total	602	100.0

Source: Primary Data (2019)

The results in Table 4.5 imply that most math teachers have had adequate experience with the student and also that students may know them better since they have interacted with them for a long time. As for marital status of the students' mathematics teacher, results in Table 4.5 indicated that majority of the students were not aware whether their math teachers were married or not (49.0%) followed by 42.0% who knew that their math teacher was married (42.0%) while 9.0% knew that they were single.

Table4.6: Marital Status of Mathematics Teachers

Education levels	Frequency	Percent
Single	57	9.0
Married	265	42.0
I Don't know	309	49.0
Total	631	100.0

Source: Primary Data (2019)

These results reveal the fact that many students do not interact with their math teachers to the level of knowing their marital statuses.

4.2 Description of the Dependent Variable

For the dependent variable of this study, the researcher examined the level of students' academic performance in mathematics in the four government secondary schools in Makindye Division, Kampala. To measure students academic performance in Mathematics, three sets of data were collected; 1) Through one question in the questionnaire, students were asked to indicate their score in mathematics in the third term of 2018; 2) The researcher also collected records of the math's score of last year third term, 2018 to compare with what the students reported as their math score in that term; 3) The researcher observed the mathematics teachers teaching and after which, the teacher gave a mid term test and finally end of term one 2019 exams, which two sets of exams were added and an average was used used on end of term reports students took home. The data on this average math score collected and used in this analysis. Descriptive statistics for these three sets of data on math performance are comparatively presented in table 4.7.

Table4.7: Descriptive Statistics on Students Mathematics Performance in the four Public Secondary Schools (Terms three 2018 and term one 2019)

Data set	School	Sample	Mean	Std. Deviation	Minimum	Maximum	F	Sig.
Math's score end of Term3 2018, Students' Response	Kibuli	186	73.06	11.145	40	96	48.673	.000
	KCCA School	119	58.73	17.387	1	98		
	St. Peters	127	72.57	14.653	20	100		
	St. Denis SS	94	56.35	14.614	24	90		
	Total	526	66.71	16.041	1	100		
Math's score end of Term three 2018 Records	Kibuli	398	50.39	17.92194	.00	96.00	185.3	.000
	St. Peters	140	41.05	19.559	2.50	94.00		
	KCCA seed	273	19.03	15.778	.00	90.00		
	St. Denis	123	28.38	17.535	1.00	91.00		
	Total	934	36.93	22.129	.00	96.00		
Math's score End of Term1 2019 Records	Kibuli	349	44.81	16.638	1.00	88.00	25.99	.000
	St. Peters	206	36.58	16.165	4.70	81.50		
	KCCA seed	211	34.05	20.409	3.00	96.00		
	St. Denis	66	29.55	16.513	2.00	71.00		
	Total	832	38.83	18.327	1.00	96.00		

Source: Primary Data (2019)

According to the results in Table 4.7, based on the records gathered from the different math departments of the four schools, students' performance in mathematics was generally poor, since for the two terms under assessment, the average score is below average (36.93% in 2018 and 38.83% in 2019). However, considering students' responses, the performance was generally good, with a general average of 66.71%. The researcher considered the data generated from the official records because they are more reliable than those got from students, responses. To further analyses the performance results, the scores were categorized based on performance ratings indicated in Table 4.8A.

Table 4.8: Students' Performance and Mathematics Based on Performance Ratings

Performance Ratings	Math Performance in Term three 2018		Math Performance in Term one 2019	
	Frequency	Percent	Frequency	Percent
Very poor (Below 30%)	242	39.0	220	37.6
Poor (30 – 49%)	181	29.2	209	35.7
Fair (50 – 59%)	83	13.4	76	13.0
Good (60 – 74%)	78	12.6	57	9.7
Very good (75% and above)	36	5.8	23	3.9
Total	620	100.0	585	100.0

Source: Primary Data (2019)

The results in Table 4.8A confirm the results in Table 4.7, suggesting that majority of the students in the four public schools of Makindye Division were poor performers. As it is indicated in Table 4.8A, almost 70% or more are in the category of very poor and poor, followed by more than 13% who performed fairly. Less than 20% of all students performed good or very good in the two terms assessed. This confirms that majority of the students in the schools studied performed below average.

During the interview session, participants were asked whether their students are doing well in mathematics or not and why. One of the participants gave his view as follows; "*some do well, some don't because their background in S1, S2 and S3 was poor*". This participant did not explain why the background was poor. Another participant said; "*they do fairly (average), not bad, because there are no materials no provided books, math sets or any educational materials. Another issue is student absences"*. From St. Peters Nsambya, a participant only gave a reason which implied that the students were also not doing well in mathematics, saying that; "*the students only share interaction verbally without going to the board or prepare lessons and doing the role of teachers even if for few minutes"*. This concerns lesson development, and it indicates that the students' poor performance can be partly attributed to poor lesson development by the teacher. This is because, it is the teacher to prepare students and given them tasks and instructions that can allow them go to the board and discuss or teach others what they have prepared. So, if the teacher does not prepare this, it is difficult for students to do it.

From the interviews, it was revealed that some students do well others fair while many perform poorly. What was common that most participants from KCCA and St. Denis indicated that the performance was not generally good. For example, one participant from one of these two schools said;

> *"Not well, because their performance is poor due to universal secondary education, they came when they were poor. Also, they don't care neither do their parent".*

And another one added that; "*some are high, some are low and others are in the middle, because its dependents on their nature*". A similar view also came from one participant in one of the two schools;

> *"Not all, for example, 15 out of 90 students pass, because fist of all, their attitude towards math is bad, they think just the same because math is a hard subject. And their background in the primary and they are lazy by themselves".*

Yet another gave a percentage bigger than that; "*not all of them, about just 30% perform well because they do not have materials (necessary requirements like books, exercise book), they have poor background and there is no part of the subject to apply*". These findings are in agreement with what was got from the records. This confirms that performance of students in math is still generally poor.

The exceptional case was from Kibuli SSS, where both quantitative findings based on records of marks and qualitative findings based on the views of math teachers indicate that students' math performance in this school is not poor. For example, one participant from Kibuli said; "*Yes, they do, but in average. They have different capacity*". Another one in this same school said that their students perform "*well, because they over ask to understand*". And concerning the reasons why these students perform well, the participant said; *"the teachers are so active, and care about students' performance. They have knowledge on how to handle students' interaction behavior and with themselves".* One participant explains the general reasons why students may not perform well in math, giving the main reason as less financial pay or small salary, limited time to cover the syllabus and students' poor background;

> *"Yes, less than 20% get less than 50%, this is because first of all, teachers demotivate them, since teachers are paid 600,000 shillings without accommodation or transport, what do you expect from them? Also, students had come with their problems in primary (universal primary education), in addition to that the number of teachers is to cover all those students".*

And when asked what should be done in order to deal with the problem of poor performance in mathematics, participants gave different views. For example, one of them replied that students should "*revise usually and that includes extra lessons and exercises*". Another one said that they should "*try to instruct them and provide them teaching aids*". These extra lessons also require extra pay, which most of the teachers reported that it was missing. This argument is in line with one point of view got from a participant of Kibuli SSS; *"generally all subjects, if the teachers were paid well, they will teach well. Also, to provide a suitable number of math teachers*". However, other participants gave solutions which more of pedagogical than financial motivation. For example, one participant said that, when starting a math class, "*you are not supposed to start by giving them difficult questions, start simple*. This deals with the methodological motivation of students towards math. Another one gave a similar solution in the way students are taught, saying that;

> *"giving them more exercises or practical, because we have limited time. We also need to follow their performance and find out what they need. And then award them when they get high marks to motivate them".*

While this may also require extra allowances if these take extra or more time and require more time and energy to mark outside the normal time table, however, the teacher can use their own time on the time table to plan and give these exercises and practices. Group discussions can also work better in this regard ad require less costs to organize. However, based on another view from one participant, group discussions require that students are well oriented on self reading and that it may "*need a lot of teaching aids; textbooks (especially, if we group to improve their performance then where are the teaching aids*). In addition to this view, another participant said; "*deep discussion questions, coordinators leaders and more exercises, we also need to test them every after two weeks or week by week".* A similar point view was also give showing that mat teachers should "*change the teaching approaches and methods. For example, they have to move and try to think by themselves, need more support and encouraging them to share with teacher in math like share in blackboard for example*. Another one suggested the use of projectors, to move round the class and to encourage students to do models by themselves.

One participant gave a solution to improve the performance of girls in math, saying that; "*encouraging the girls to share and by showing them that mathematics are not only for men and it's not hard, it can be done step by step. I pick the weak students and ask them to stand and answer to get attention, and next time and I enforce them to ask if they don't know*". This has to do with academic counseling, which may be done by the teachers themselves during their time of teaching and through special counseling sessions organized once in a while.

How to Improve Performance of Students in Mathematics

Interviewees were asked on they thought could be done to improve performance of students in mathematics and they gave different views as discussed here under. Most of the interviewees indicated that making constant revisions with students in mathematics can help to improve performance in this subject. Another solution they gave was giving extra lessons and exercises. One of the teachers when asked; what do you think needs to be done to improve the performance of students in mathematics? Said that; "*try to instruct them and provide them with teaching aids"* Another teacher from Nsambya said that; "*you are not supposed to start by giving them difficult questions, start simple*". This participant added that; "*give them their time, encourage them and be friendly with them, but balance it with controlling them*". From the views of this teacher, we derive a point that math teachers can play with the psychology of the learners to improve their performance. For example, moving from known to the unknown, means that the teacher starts with what is easy and so learners become encouraged to learn and they love the subject believing that it is easy and in the end their performance improves. Also, in addition, we can learn from these views that teachers can encourage or discourage learners towards a subject like mathematics. Being friendly to students can encourage them and also make them improve their discipline, which is key to their successful performance.

Many other ways were given by the teachers during the interview on how to improve students' performance in mathematics. Some of them are summarized here under:

Table 4.8B: Teachers' Views on How to Improve Students' Performance in Mathematics

Teachers' Comment	School
We also need to follow their performance and find out what they need. And then award them when they get high marks to motivate them.	Nsambya
Need a lot of teaching aids; textbooks (especially, if we groups to improve their performance then where are the teaching aids).	KCCA
Encouraging the girls to share and by showing them that math is not only for men and it's not hard, it can be done step by step. I pick the weak students and ask them to stand and answer to get attention, and next time and I enforce them to ask if they don't know.	KCCA
Change the teaching and approaches methods. For example, they have to move and try to think by themselves, need more support and encouraging them to share with teacher in math like share in blackboard for example.	KCCA
We continue testing them, make them practice and improve their approach	Kibuli
Generally all subjects, if the teachers were paid well, they will teach well. Also to Provide a suitable number of math teachers.	Kibuli
Deep discussion questions, coordinators leaders and more exercises, we also need to test them every after two weeks or week by week.	Kibuli
Projectors, to more round the information. We need to encourage students to do models by themselves.	Kibuli

From the summary of views in Table 4.8B, a number of ways to improve students' performance in mathematics were advanced which include making follow up of their performance, finding out their needs, awarding good performers, making use of better teaching aids like textbooks, encouraging them to share, changing teaching approaches like involving students in problem solving and think by themselves, continuous testing and exercises, paying math teachers well and increasing the number of math teachers.

4.3 Relationship between Classroom Management and Students Mathematics Performance

The first objective of this study was to establish the relationship between classroom management (first element used to measure teacher classroom interaction behavior, the independent variable of this study) and students' mathematics performance in the four public secondary schools in Makindye Division, Kampala Uganda. The element of classroom management was measured using 13 question items in the questionnaire, which were Likert scale using four points, with the following rating scales; 1 = strongly disagree; 2 = disagree; 3= agree and 4 = strongly agree. Analysis of the data on these 13 question items was done using descriptive statistics showing means and standard deviations and thereafter results of bivariate tests for their significance using Pearson's correlations is done with the dependent variable, ending with testing of the corresponding hypothesis using simple linear regression.

Table4.9: Means and Standard Deviations on Level of Classroom Management

Items used to measure Classroom Management	Mean	S. D	Interpretation	Rank
Allows students to ask questions in relation to the topic he is teaching	4.76	.598	Very Good	1
Begins classes on time and ends on time	4.64	.722	Very Good	2
Actively interacts with students and supervises what they do	4.63	.724	Very Good	3
Gives exercises, marks & makes corrections with you	4.63	.725	Very Good	3
Comes to class well prepared (with all tools to use & exercises)	4.57	.785	Very Good	5
Gives extra time and assistance to students who have not understood	4.55	.808	Very Good	6
Frequently observes and engages students in the teaching learning process	4.53	.793	Very Good	7
Talks to students with respect even when giving corrections	4.42	.864	Very Good	8
Uses and calls correctly student names in class interactions	4.04	1.198	Good	9
Arranges the class room well to avoid crowding and obstruction	3.92	1.329	Good	10
Uses minimum harshness to deal with students who break class/school rules	3.88	1.217	Good	11
Sets classroom rules together with students	3.64	1.336	Good	12
Makes roll calls from the class register.	2.92	1.335	Fair	13
Average Mean	4.26	.505	Very Good	

Source: Primary data (2019)

The following mean ranges were used to interpret the means;

Mean range	*Response range*	*Interpretation*
4.21-5.00	Strongly agree	Very good
3.41-4.20	Agree	Good
2.61-3.40	Not sure	Fair
1.81-2.60	Disagree	Poor
1.00-1.80	Strongly disagree	Very poor

The results in Table 4.9 reveal that teachers' classroom management was rated to be very good on most of the items. For example, the highest rated item was onwhether the teacher 'allows students to ask questions in relation to the topic he is teaching', with a mean rating of 4.76, which falls under very good on the interpretation scale. The standard deviation (SD= 0.598) was not big showing that the results did not differ so much. The next rated item is on whether the math teacher 'begins classes on time and ends on time', with a mean score ($\overline{x}$ = 4.64) falling under very good and a low standard deviation (SD=0.722) showing that results did not differ so much. It is only on one question item where classroom management was rated fair and this was on whether math teachers 'makes roll calls from the class register, with a slightly lower mean rating of 2.92, but a high value of standard deviation (SD=1.335) revealed that results differed so much from this mean score. To get the overall picture on how students rated their math teachers' classroom management behavior, an average mean was computed by adding the mean scores of all items in Table 4.9, which came out to be 4.26 and this corresponds with very good on the interpretation scale, indicating that students rated their math teachers' classroom management behavior to be very good.

During the face to face interviews with math teachers and heads of departments, a question was asked; Comment on the extent of classroom management by the teachers of math in this school. Many showed that their classroom management is good, others fair while some said it has challenges but they try their best. For example, a teacher from St. Denise said;

> *"there is only 50% of control management, you can't manage them all, because some don't stay with their parents they stay alone, some are orphans and others, you don't know their background, so there is no communication with their parents or guidance, so how can we manage them if they miss behave?".*

This view gives interesting lessons that some factors outside the school also can affect the ability of a teacher to manage a class. Those revealed by this participant include parental status, parental guidance and communication between the teacher and the parents or guardians. It is also important to identify the fact that teachers can use different approaches to manage different types of students, if they get to understand them well. But it is also a responsibility of a teacher to try and understand their learners, so that they can devise ways of managing them better.

The way teachers manage classes differ. One teacher from St. Peters Nsambya explained the extent and the way teachers should manage classes; "*encourage them well and give them homework to manage and control them".* Another teacher from the same school had this to say; "*It's okay, we manage and control them well, they know the rules and follow them"*.

These views suggested that the teachers are mainly responsible in managing well the class, by giving assignments which make students busy and setting up classroom rules students are required to follow. Another teacher from KCCA agreed with this view and indicated that classes are always manageable, although there are some few cases which as teachers they fail to manage well. He showed that they cannot manage everything and all students who are always many in classes.

A teacher from Kibuli gave some explanations on how teachers can effectively manage their classes, saying that; "*you have to be in class control first*…*they must expect your questions at anytime. You must attract them*". While another teacher said that; "*I manage them very well, I haven't seen them, but I think they do as well*'. These qualitative findings somehow agree with the quantitative findings in Table 4.9. It is revealed that classroom management is generally good, though there are some points which are not good.

During the observation session, the researcher observed that most mathematics teachers encouraged students to ask creative questions and also gave them time to answer one exercise and corrects them individually. But despite this, some of the teachers would come to class ten minutes late. This however suggests that classroom management was generally good in majority of the schools visited. It was further observed that some mathematics teachers liked to smile and taught with their students. It was observed that the interaction for boys was more than girls and some teachers were not linking mathematics lessons to real life. In general, most of the teachers observed were generally good in classroom management, except a few, who did not greet their students at the beginning and were talking harshly during their lessons.

Relationship between Classroom Management and Students' performance in Mathematics

Since classroom management was found to be very good, the researcher went ahead to examine if this good management helps to produces good performance results in mathematics. For this reason, the researcher correlated the computed class room management index with students' scores in mathematics for third term 2018 and first term 2019, using Persona's linear correlation coefficient (PLCC). The results are presented in table 4.10.

Table 4.10: Pearson Correlation for Classroom Management and Students' performance in Mathematics

Variables correlated	R-value	Sig.	Interpretation	Decision on Ho
CRM Vs Math Scores in Term3 2018	.080	.064	Insignificant correlation	Accepted
CRM Vs Math Scores in Term1 2019	.041	.350	Insignificant correlation	Accepted

*CRM= Classroom Management

The Pearson's correlation coefficient results in Table 4.10reveal that teachers' classroom management behaviour had an insignificant positive relationship with students' performance in mathematics in all the results assessed (all p-values> 0.05). Therefore, with all the sets of mathematics scores, classroom management was not found to be significantly correlated with students' performance in mathematics. This implies that the good classroom management behaviours of math teachers did not help them to produce better performing students.

To further ascertain the results of the Pearson's correlation, simple linear regression was applied to help the researcher determine the strength of the effect teachers' classroom management behavior has on students' performance in mathematics. In line with this first objective, the researcher tested a null hypothesis that teachers' classroom management behavior has no significant effect on students' performance in mathematics in Makindye Division public secondary schools. Results of this test are indicated in Table 4.11.

Table4.11: Regression Analysis for Classroom Management and Students' Performance in Mathematics

Variables Regressed	R^2	F-	Sig.	Interpretation	Decision on Ho
Classroom Management Vs. Math Scores in 2018	0.002	0.874	0.350	Insignificant effect	Accepted
Classroom Management Vs. Math Scores in 2019	0.006	3.445	.064	Insignificant effect	Accepted
Coefficients (2018)	Beta	t			
(Constant)	24.746	3.091	.002	Significant effect	Rejected
Classroom Management	.080	1.856	.064	Insignificant effect	Accepted
Coefficients (2019)					
(Constant)	31.962	4.484	.000	Significant effect	Rejected
Classroom Management	.041	.935	.350	Insignificant effect	Accepted

The results in Table 4.11 show that, classroom management explained only 0.20% towards variations in students' academic performance in math in third term 2018 ($R^2 = 0.002$). A similarly low value of r-square was got for the results of term one 2019

(0.006), suggesting that teachers' classroom management behaviour contributed only 0.6% towards students' math scores of the first term 2019. These low r-square values suggest that 99.8% and 99.4% of the variations in students' math performance in third term 2018 and term one 2019 respectively, were accounted for by other factors not considered here, such as the method of teaching used, the quality of content, the attitude of the learners and other factors.

A closer look at the F-statistic and p-values reveal that the regression models were not significant, indicating that classroom management has no significant effect on students' performance in mathematics. The coefficients section of the regression table (Table 4.11) give us the beta values, which tell us the magnitudes classroom management had on the respective results of 2018 and 2019.According to these betas, classroom management had no significant on students' performance in 2018 and in 2019, since all the corresponding sp-values were greater than 0.05. The constant values indicated that when classroom management is taken to be zero (or very poor in this case) students' performance in math can be significantly high. Based on these results, the null hypothesis was accepted and a conclusion is made that teachers' classroom management does not significantly determine students performance in mathematics.

4.4 Relationship between Lesson Development and Students Mathematics Performance

The second objective of this study was to establish the relationship between lesson development (second element used to measure teacher classroom interaction behavior) and students' mathematics performance in the four public secondary schools in Makindye Division, Kampala Uganda. Lesson development was measured using 11 questions in the questionnaire, which were also Likert scaled using five points, with the following rating scales; 1 = strongly disagree; 2 = disagree; 3 = Not Sure; 4 = agree and 5 = strongly agree. To achieve this second objective, data on lesson development behaviour was analysed first using descriptive statistics showing means and standard deviations and thereafter bivariate tests for their significance using Pearson's correlations was done with the dependent variable (math scores) and finally testing of the corresponding hypothesis was done using simple linear regression. Results are shown in table 4.1.

Table 4. 1: Means and Standard Deviations on Extent of Teachers' Lesson Development Behavior

Items one Lesson Development	Mean	Std. Dev.	Interpretation	Rank
Encourages student's participation in class.	4.62	.734	Very good	1
Tells students about what he or she is going to teach and the aim of the lesson	4.52	.846	Very good	2
Follows a clear mathematics curriculum.	4.46	.866	Very good	3
Comes to class with a lesson plan	4.42	.982	Very good	4
Links previous lesson with current lesson	4.42	.964	Very good	4
Links maths content to real daily life examples	4.41	.978	Very good	6
Allows learners to give explanations in class	4.34	1.008	Very good	7
Discusses mathematics content outline with students	4.25	1.032	Very good	8
Guides learners to make groups & always gives group work	3.98	1.286	Good	9
Begins math lessons with interesting question	3.95	1.207	Good	10
Begins math lessons with interesting picture/diagram	3.11	1.440	Good	11
Average Mean	4.24	.576	Very good	

The results in Table 4.12 reveal that teachers' lesson development behaviour was also rated to be very good on most of the items. It was rated highest onteachers' behavior of 'encouraging students' participation in class', with a mean rating of 4.62, which falls under very good on the interpretation scale and a standard deviation (SD= 0.734) which is relatively low, showing that the results did not differ so much. In brief, eight items out of 11 were rated very good, while the remaining three items were rated good. The average mean on students' ratings of their math teachers' lesson development behavior ($\overline{x}$ = 4.24), falls under very good on the interpretation scale, indicating that students rated their math teachers' lesson development behavior to be very good.

During the face to face interviews, participants were asked to comment on the extent of lesson development by the teachers of math in their schools. Different views were generated, which indicated that math teachers had different approaches and understanding on how lesson development is done. One the interviewees from St. Denis commented; "*not all students can link up with last lesson, because each day there is a new student face. Another issue is that there is no lesson application".* This participant's view went in direction of challenges experienced in lesson development and not the way they do it. However some were much aware of the concept lesson development and what is required of them. For example, a teacher from one of the streams of St. Denis had this to say; "*we teach them step by step and move slowly by giving them examples first, we even test them periodically*". Another teacher from the same school adds to this that; "*some lessons are difficult to apply, but we try to link to daily life for students to analyze it*". This view is not in agreement with the first participant's view which indicated that there is no lesson application. The view that lessons are difficult to apply but teachers try to daily life is also supported by the teacher from KCCA, who said that they use a step by step procedure in developing their lesson. This was supplemented by another participant from KCCA, who said that "*slowly by slowly (very easy then step by step to hard). For those who are absent we teach them from 5pm up to 7pm evening or very early in the morning. We have extra lessons also*". This shows that lessons are developed differently by different teachers in different schools. But this also seems to be dependent on the attitude of the teacher, experience and the school administrative arrangements. If for example, the administration encourages teachers and makes arrangements to always make Revision for students, teachers will put it in their lesson plans and do it.

The organization and the steps a teacher plans to follow during the actual conduct of a lesson matter a lot in the quality of teaching. One interviewee from Kibuli showed that; "*I try to move slowly and no need to rush, but confirm that the information has* *reached them*". This slow pace may make even slow learners to understand math. Another teacher from Kibuli indicated that; "*the students love math, because the teachers test them after each unit and look for slow students then they cover all the levels of students' understanding*". So these kinds of approach imply that lesson development in some of the schools was really good. This is in agreement with the quantitative findings in Table 4.12. The researcher observed that some teachers were perfect, apart from that they didn't make students share in blackboard by themselves. It was also observed that some mathematics teachers arranged the blackboard very well.

With this very good lesson development behavior result, the researcher went ahead to examine if it helps to produce good performance results in mathematics. So, the researcher correlated the computed lesson development index with students' scores in mathematics for third term 2018 and first term 2019, using Persona's linear correlation coefficient (PLCC), results of which are presented in table 4.13.

Table4. 2: Pearson Correlations for Lesson Development and Students' Performance in Mathematics

Variables Correlated	r-value	Sig.	Interpretation	Decision on Ho
LD Vs Math Scores in Term3 2018	.063	.138	Insignificant correlation	Accepted
LD Vs Math Scores in Term1 2019	.028	.525	Insignificant correlation	Accepted

*LD = Lesson Development

The results in Table 4.13 reveal that teachers' lesson development behaviour had no significant correlation with students' performance in mathematics in all the results assessed (all p-values> 0.05). The results however reveal that lesson development is positively correlated with students' performance in math, which means that an improvement in lesson development is likely to improve students' performance. These insignificant results imply that the good lesson development behaviours of math teachers do not help to improve students' performance in math.

In line with the second objective of the study, the researcher tested a null hypothesis that teachers' lesson development behavior has no significant effect on students' performance in mathematics in Makindye Division public secondary schools. To test this hypothesis and to find out the extent to which teachers' lesson development behaviors affect students' performance in mathematics, simple linear regression was used and the results are indicated in table 4.14.

Table4.14: Regression Analysis for Lesson Development and Students' Performance in Mathematics

Variables Regressed	R^2	F	Sig.	Interpretation	Decision on Ho
Lesson Development Vs. Math Scores in 2018	0.001	0.404	0.525	Insignificant effect	Accepted
Lesson Development Vs. Math Scores in 2019	0.004	2.210	.138	Insignificant effect	Accepted
Coefficients (2018)	Beta	t			
(Constant)	28.748	4.084	.000	Significant effect	Rejected
Lesson Development	.063	1.487	.138	Insignificant effect	Accepted
Coefficients (2019)					
(Constant)	33.959	5.321	.000	Significant effect	Rejected
Lesson Development	.028	.636	.525	Insignificant effect	Accepted

The results in Table 4.14 indicate that, lesson development behaviour explained only 0.1% and 0.4% towards variations in students' academic performance in math in third term 2018 (R^2 = 0.001) and term one 2019 (0.004). These results suggest that 99.9% and 99.6% of the variations in students' math performance in third term 2018 and term one 2019 respectively, is accounted for by other factors as mentioned above. The F- and p-values indicate that the regression models were not significant and so lesson development had no significant effect on students' performance in mathematics. The beta values in the coefficients section of the regression (Table 4.12) reveal that lesson development had no significant effect on students' performance in 2018 and in 2019, since all the p-values were greater than 0.05. Based on these results, the null hypothesis was accepted and a conclusion is made that teachers' lesson development behaviour does not significantly affect students' performance in mathematics.

4.5 Relationship between Materials Use and Students Mathematics Performance

The third and last objective of this study was to establish the relationship between materials use (third element used to measure teacher classroom interaction behavior) and students' mathematics performance in the four public secondary schools in Makindye Division, Kampala Uganda. Materials use was measured using six question items in the questionnaire, which were also Likert scaled using five points, with the same rating scales as in the two constructs seen above. Data analysis was done using descriptive statistics showing means and standard deviations and thereafter results of bivariate tests for their significance using Pearson's correlations is done with the dependent variable, and finally testing of the hypothesis using simple linear regression. Results are shown in Tables below;

Table 4.15: Means and Standard Deviations on Level of Materials Use

Items on Materials Use	Mean	Std. Dev.	Interpretation	Rank
Use modern text book for mathematics	4.15	1.178	Good	1
Use scientific calculators to show math example	3.86	1.382	Good	2
Use mathematical rulers to make angles and other diagrams	3.54	1.478	Good	3
Use locally made materials	3.01	1.519	Fair	4
Use clear charts to show mathematical examples	2.62	1.375	Fair	4
Sometimes uses projector to teach math	1.83	1.134	Poor	6
Average Mean	3.17	.792	Fair	

According to the results in Table 4.15, it is indicated that teachers' material use behaviour was fairly rated on some items and also rated good on some items. Materials use was rated highest onteachers' behavior of 'using modern text books for mathematics', with a mean rating of 4.15, which falls under good on the interpretation scale but the standard deviation (SD= 1.178) was slightly high, showing that the results differed so much. The second highest rated item was on the "use of scientific calculators to show math example" with a mean of 3.86, interpreted as good and the third rated was on the "use of mathematical rulers to make angles and other diagrams". The lowest rated item was on the 'use of projector to teach maths', with a mean of 1.83, which falls under poor on the Likert scale. The average mean for all items in Table 4.13 (average mean = 3.17) falls under fair on the interpretation scale, indicating that students rated their math teachers' material use behavior to be generally fair. These results indicate that while classroom management and lesson development are good, the use of materials is still poor. This may be due to the fact that the materials available in these schools are not enough and yet teachers cannot easily get them by using their own resources.

The quantitative findings in Table 4.15 are in agreement with the qualitative findings from face to face interviews with teachers and heads of departments. For example, most of the interviewees from St. Denise pointed to the fact that teachers' materials use was poor due to the fact that they are inadequate. One teacher went to the extreme saying that; "*actually we don't have"*. Another interviewee from the same school emphasized this pointing out that; "*haven't seen them using materials. The materials themselves are not available*". This suggests that materials use is obviously poor in such a school.

On the side of St. Peters Nsambya, the qualitative findings revealed somehow a fair picture about the extent of materials use, where some interviewees showed that they have some good materials while others showed that what they have is inadequate; For example, one head of department from this school said; "*they have all teaching aids and use them"*. But a teacher who was interviewed was quoted in one of his statements that; "*few material and sample models*". The researcher according to what she observed indicates that the availability of materials in this school was just fair and so their use. It was however possible for teachers to be innovative and create more additional resources and if they were doing this, then materials use would be very good, since they have already a fair beginning.

For KCCA, the situation was a bit different from other schools, where most of those interviewed from there indicated that the materials are either not there or just inadequate. One of the interviewees indicated that the teaching materials were "*almost not there*". But another participant said; "*we have material that are not enough, because the number of students is big*". One may think that due to a large number of students in such a school, being a Universal Secondary Education (USE) school, it is possible that the materials are always bought but they are just not enough. But in such a situation one would expect that teachers use general materials which can be used by the whole class than using those materials for each student.

In Kibuli Muslim Secondary school, the situation was a bit different and positive as compared to the other first three schools. For example, one the head of department was quoted saying;

"Generally, it's good, because we give them time to be sure that they have got the lesson very well. No need to rush when they have not understood, we need to revue and install the information for every lesson".

The other participant from kibuli said that; "*fair, because we tell them must pass and encourage them that they can. We usually revise with them, we put them in pressure (insist them)*". This can be interpreted that the experience a teacher has in teaching can help him/her use a few materials and be innovative in different ways and will therefore fit in the environment. This put aside, one other teacher interviewed resisted by saying that; "some are not available, but we manage to get them math set or what they need in a specific lesson. All in all, we derive from the quantitative and qualitative findings that the level of materials use in the teaching of mathematics is still generally poor in most schools save a few like Kibuli and St. Peters Nsambya.

The researcher went ahead to examine if the fair use of materials is the one responsible for the poor results in mathematics identified earlier (Table 4.7). So, the researcher computed and index for materials use and correlated it with students' scores in mathematics for third term 2018 and first term 2019, using Persona's linear correlation coefficient (PLCC), results of which are presented in table 4.16.

Table4.16: Pearson Correlation for Materials Use and Students' Performance in Mathematics

Variables Correlated	R-value	Sig.	Interpretation	Decision on Ho
Materials Use Vs Math Scores in Term3 2018	.041	.338	Insignificant correlation	Accepted
Materials Use Vs Math Scores in Term1 2019	.027	.541	Insignificant correlation	Accepted

The results in Table 4.16reveal that teachers' materials use behaviour had no significant correlation with students' performance in mathematics for all results assessed (all p-values> 0.05). But these results reveal that materials use is positively correlated with students' performance in math. This means that improving or increasing materials use by the teachers of mathematics is likely to improve students' performance in this subject.

Using the third objective, the researcher tested a null hypothesis that teachers' materials use behavior has no significant effect on students' performance in mathematics in Makindye Division public secondary schools. To test this hypothesis, simple linear regression was used and the results are indicated in Table 4.17.

Table 4.17: Regression Analysis for Lesson Development and Students, Performance in Mathematics

Variables Regressed	R^2	F	Sig.	Interpretation	Decision on Ho
Materials Use Vs. Math Scores in 2018	0.002	.921	.338	Insignificant effect	Accepted
Materials Use Vs. Math Scores in 2019	0.001	.374	.541	Insignificant effect	Accepted
Coefficients (2018)	Beta	t			
(Constant)	35.190	9.297	.000	Significant effect	Rejected
Materials Use	.041	.960	.338	Insignificant effect	Accepted
Coefficients (2019)					
(Constant)	36.626	10.926	.000	Significant effect	Rejected
Materials Use	.027	.612	.541	Insignificant effect	Accepted

The findings in Table 4.17 reveal that, materials use behaviour explained only 0.2% and 0.1% towards variations in students' academic performance in mathematics in third term 2018 (R^2 = 0.002) and term one 2019 (0.001). The results suggest that 99.8% and 99.9% of the variations in students' math performance in third term 2018 and term one 2019 respectively, is explained by other factors not examined in this study. The F- and p-values were all not statistically significant, indicating that the regression models were not significant and so materials use had no significant effect on students' performance in mathematics. The beta values reveal that materials use had no significant effect on students' performance in 2018 and in 2019, since all the p-values were greater than 0.05. Based on these results, the null hypothesis was accepted and a conclusion was made that teachers' materials use behaviour may not be responsible for students' performance in mathematics.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the discussion, conclusions and recommendations of the study. The discussion covers findings based on the study objectives. In addition, the chapter presents the areas for further study.

5.1 Discussions

This study set out to investigate the relationship between teacher classroom interactive behavior and students mathematics academic performance in public secondary schools, Makindye Division, Kampala Uganda. It was guided by three specific objectives, that included determining the relationship between i) classroom management. ii) lesson development. iii) materials use, and students mathematics academic performance in public secondary schools of Makindye Division, Kampala Uganda. The findings for each of these objectives are summarized and discussed in the next subsections.

5.1.1 Relationship between Classroom Management and Students Mathematics Academic Performance

The findings on this first objective revealed that teachers' classroom management behavior, was rated by the students to be generally very good (average mean =4.26). The Pearson's linear correlation results revealed that there was and insignificant positive correlation between teachers' classroom management behaviour and students' performance in mathematics in all the two sets of results assessed (all p-values> 0.05). The results of simple linear regression indicated that classroom management had no significant effect on students' performance in mathematics in the studied schools. It is theoretically assumed that good classroom management behaviours can be an effective tool in the development of a quality relationship between the teacher and the students in the classroom and hence improved performance. However, results of this study did not indicate improved performance in math as a result of the good classroom management exhibited in the findings. This is a critical matter because, it expected, even acceptable in common sense, as also put up by Marzano and Pickering (2003) that teachers who exhibit high-quality relationships with students get better results compared to the opposite. Marzano and Pickering (2003) reported that students whose teachers developed good relations had 31% fewer discipline problems, rule violations and other related problems than those whose teachers did not. One of the indicators of good teacher-student relations used in this study is classroom management and this investigation found out that it was generally very good.

It is also indicated by Emmer and Sabornie (2015) that proper classroom management strategies are intended to enhance good behavior and increase student academic engagement. This indicates that rhe insignificant results in this study are also in disagreement with this view. According to Brophy (2006), effective classroom management principles work across almost all subject areas and grade levels. So even for mathematics performance, it is expected to enhance it, unlike what is revealed in this study.

According to Sugai (2015), one critical aspect of developing good relationships with learners is knowing and understanding them. The findings in this study rated teachers' interaction good on three aspects related to this argument, which include talking to students with respect even when giving corrections; using and calling correctly student names in class and using minimum harshness when dealing with students who break class/school rules. These key interaction aspects help to create a positive attitude towards the teacher and the subject he/she is teaching and as some result students will love it and pass it as well.

5.1.2 Relationship between Lesson Development and Students Mathematics Performance

The findings on this first objective revealed that teachers' lesson development behavior, was rated by the students to be generally very good (average mean =4.24). The Pearson's linear correlation results revealed an insignificant positive correlation between teachers' lesson development behaviour and students' performance in mathematics in all the two sets of results assessed (all p-values> 0.05). The results of simple linear regression (Table 4.12) indicated that lesson developmentwas not a significant determinant of students' performance in mathematics in Makindye Division public secondary schools.

Theoretically, lesson development considers the actual implementation of the planned teaching-learning activities in the actual classroom situation (Wong, 2016). So it involves systematic approach for the teaching of concepts, skills and attitudes. It is therefore the classroom teaching learning activities and steps taken that lead to achievement of teaching learning objectives (Sugai, 2015). So the way such actions and activities are developed, arranged and delivered during the class time determine the way students learn and therefore their learning success. The findings in this study failed to agree with this theoretical stand and logical framework. Yet on the other hand, descriptive findings of this study revealed that teachers' lesson development behavior were very good and so we would expect to have students with very good marks because the theorized relationship is almost linear. Previous literature dos agree with logical expectations that good lesson development results into good performance results because it involves steps towards motivating learners to the content being taught and other actions like linking current topic to previous and what is already known, hence the saying 'from known to unknown'. This behavior tends to motivate learners' curiosity because they are learning what already makes sense to them (Sugai, 2015).

In line with this, the findings of this study revealed three important aspects of actual lesson development, which were also rated very good and good respectively, which according to Wong (2016) are the actual ingredients of good lesson development. Students rated their teachers very good on the activity of linking previous lesson with current lesson, linking mathematics content to real daily life examples and allowing learners to give explanations in class. They also rated good these actions of their math teachers; beginning math lessons with interesting question or picture/diagram. While these results seem to be deviating from what is expected by most scholars, some other effects of good lesson development could not be measured in this study.

For example, Simonsen (2015) indicated that good lesson development should result into students developing their own thinking, reflections and experiences. But the type of examinations given does not clearly measure such these attributes.

In line with the findings of this study, Pressley (2000) reported that students' collaborations and working in groups helps learners to increase awareness of their own thinking and knowledge. This boosts their performance both in class and outside. This is because, students share their views and perspectives with others which helps them to discover different ways of solving problems. This helps them to build on each other's contributions to build new interpretations and views that would not be discovered if this chance was not given. This is expected to put students' abilities to different higher levels. This is agreed upon and supported by many researchers for example; Ingwalson and Thompson (2007); Ellis (2005); Howie and Plump (2000) and others.

5.1.3 Relationship between Materials Use and Students Mathematics Performance

The findings from the third objective revealed that teachers' materials use behavior, was rated to be generally fair (average mean = 3.17). The Pearson's linear correlation results revealed an insignificant positive correlation between teachers' materials use behaviour and students' performance in mathematics (all p-values> 0.05). The simple linear regression (Table 4.15) indicated that materials usewas not a significant determinant of students' performance in mathematics in Makindye Division public secondary schools.

According to Ifamuyiwa (2008) the use of different teaching materials (e.g. textbooks, teacher's guides, reference books, software materials, charts) make learning and comprehension easier for students at all levels. This is so because, learning activities are shaped in such a way that encourages all students to learn and build good interaction among students and their teacher (Omari, 2001). All these produce better math results but in the case of this study, materials use was fair and performance was also poor. One can say that it is the inadequate use of materials that is responsible for the poor performance. However, the statistical tests proved otherwise.

Some other scholars have also found inadequate use of materials in math and other science subjects. For example Katunzi and Ndalichako (2002) found out that, there was inadequate use of instructional materials for science subjects, mathematic subject inclusive. This makes teaching a bit difficult and learning as well and according to Katunzi and Ndalichako (2002), this inadequacy may lower students' performance. And according to Ifamuyiwa (2008), the use of teaching materials make teaching learning very conducive, encourage students' participation, makes them concentrate and stimulates students interest.

According to Howie and Plomp (2000) there is a positive link between the effective use of teaching learning materials and students' academic performance. The findings of this study agree with this revelations, although the results were not significant statistically. The inadequacy of materials may have caused the poor assessment which respondents gave it, making it insignificant. Howie and Plomp (2000) also indicated that students in developing countries have few chances of getting exposed to modern types of teaching materials and so they may not be in position to assess them fairly. Kiwia and Odada (1991) also explained that learning as materials enhance active participation and interaction between a teacher and students, they become more competent since they are more involved in various tasks during the class which boosts their performance.

5.2 Conclusions

The findings of this study revealed that the kind of classroom interactive behaviors exhibited by the math teachers do not help to promote students' performance in this subject, something which deviates from theory and logic. The researcher believes that this deviation is due to the fact that teachers do not use modern techniques of interaction partly because they are not well monitored on their use and are not given refresher trainings on their use, yet those materials are also very inadequate in terms of availability.

While classroom management is perceived to be very good by the students, it is important to observe what the teachers actually do in class. Students may be convinced by the way the teacher teaches but when their performance is not good, it indicates that they are not exposed to better methods so they see what their teachers do as very good. This is partly why their performance is poor even when their teachers are rated good in classroom management. So, the implication of these findings is that it is true base on so many other researches that good classroom management can improve students' performance. But most of the good and modern approaches do not exist in these schools despite the fact that these are city schools with better trained teachers.

Teachers' lesson development behavior has a positive but insignificant effect on students' performance in mathematics. But as the case is for classroom management, teachers' do not use modern techniques of delivering lesson and students are not exposed to them, so they do not know whether the teacher is doing what is best or not. But from the observation of the researcher, many better aspects of lesson development are left out by most teachers who participated in this study. For example, most of the teachers did not write the title on the board, they simply mentioned it verbally. So, if a student came late or was not attentive when a teacher was making a verbal mention, he or she may not be able to pick. Therefore, the insignificant results from students exist but there are many strong modern techniques and practices which teachers leave out and these may be the reason why their students' performance in math is still poor.

For the case of materials use, which was found to be inadequate and with insignificant effect on students' performance, the researcher still believes in what most researchers brought out, which supports a positive significant effect. However, for the case of this study, results are insignificant because materials are inadequate and both students and teachers are not exposed to modern materials. Since materials are physical and can easily be seen, students found it easy to rate them inadequate and this agrees with what the researcher observed.

5.3 Recommendations

From the findings and conclusions of this study, the researcher needs to make the following t recommendations, made following the study objectives:

As regards classroom management, there is need for teachers to emphasize roll calls before or after the class. They can do this by devising better ways of doing it without wasting much time, especially where the classes are very big. Also the teachers should provide guidance to their students in order to be able perform well in mathematics. It further recommends that teachers should create favorable learning environments through ensuring a good relationship with their students so that they can ask questions whenever they do not understand hence improve on the performance in mathematics.

As for lesson development, math teachers need to improve on the way they begin their lessons to attract their learners more. Furthermore the researcher recommends that teachers and management of schools should ensure to reward the best performing students in class so that they can motive them and even other students to work hard and improve on their performance. It is also recommended that teachers should work together with parents especially when dealing with undisciplined students within the classrooms. The study recommends that teachers should create groups amongst students so that they can learn faster and quickly. For example, Teacher choosing students groups to present in class hence enabling them to fully understand concepts in mathematics. It is also recommended that the topic of classroom interactive behavior should be emphasized also at in-service teacher training level to keep the teachers abreast with current professional requirements.

As to materials use, it is recommended that the teachers should prepare the laboratory equipments and classroom teaching aids. For the use of computers, in order to facilitate the use of computer software in the study of mathematics and the requirements of this software from languages such as Java and other programming languages.

5.4 Areas for Further Research

The researcher suggests that:

1. A study should be conducted on classroom interactive behavior in relation to student performance in mathematics in County and the rest of the counties in Uganda because this research was conducted in Kampala Division only. This study is important because the classroom interactive behavior have a positive relationship while when the interactive behavior was missing the classroom leading to negative relationship to student performance in Mathematics. It is necessary to find out if similar results hold true in the other parts of Uganda.

2. A study should be conducted on classroom interactive behavior in relation to student performance in other subjects like languages, humanities, physical, technical subjects and other sciences because little has been done in these areas.

3. Teachers' Personality and Training and Students Performance In Mathematics in Private Secondary Schools in other divisions in Kampala, Uganda.

REFERENCES

Abbas Sabti (25 Jul 2017): *interaction in the classroom. Al- Menshawi Center for studies and research* . Egypt http://www.minshawi.com /node/add/abstract

Abdul Gafoor, K. and Haskar Babu U. (2012): *Teaching Style: A conceptual Overview In S. Sabu, Teacher Education In The New Millenium* New Delhi: APH. Pp 55-69

Ahmed Ali Khalaf Abu Obeid, Maher Mohamed Jaradat (June 2009): *the impact of the use of educational strategy based on social interaction through collaborative learning in the development of verbal communication skills among students in the sixth grade in the basic mathematics* in Jordan, P: 2, Ouargla www.ouargla-univ.dz (1993)

Alameedd 70. (June 2, 2015): Interactive Symbolism in Contemporary Sociology. Saudi Arabia. Alameed70.wordpress.com

American Psychological Association Zero Tolerance Task Force. (2008). Are zero tolerance policies effective in the schools? An evidentiary review and recommendations. *American Psychologist, 63,* 852-862.

Antonio cartelli (July, 2008): Encyclopedia of Information Communication Technology (University of casino and Southern Lazio, Italy) and Marco Parma (University of Casino, Italy). https://www.igi-global.com/book/encyclopedia-information-communication-technology/359

Baer, G. G. (2015). Preventative classroom strategies. In E. T. Emmer & E. J. Sabornie (Eds.), *Handbook of classroom management* (2 nd Ed.) (pp. 15-39). New York: Taylor and Francis Group.

Bell, J. (2005). Doing your research project: a guide for first time researchers in education, health and social science. Berk Shine: Open University Press.

Berk, R.. (1988) *Fifty reasons why student achievement gains does not mean teacher effectiveness.* Journal of Personnel Evaluation in Education, 1(4) 345–364.

Best,W. J. & Kahn, J. Y. (1986). *Research in education*. New York,America: Pearson.

Biggs, J. (2015) Teaching for Quality Learning at University (pp. 165-203). Buckingham, UK: SRHE and Open University Press.

Binde, A. (2010) *Conceptions of Mathematics Teacher Education: Thoughts among the Teachers Educators in Uganda,* Abo: Abo Academy University Press.

Bloom, G. (1980). *Cognitive development levels of human*. California, CA: Sage.

Bochen, R. (2007). *Educating teachers mathematics concepts and ideas*. Lagos, Nigeria: Oxford University Press.

Borg, R. W., Gall, P. J & Gall, D. M. (2007). *Educational research: An introduction* New York, America: Sage.

Bouma, G.D. (2000) *The Research Process, 4th ed..* London, England: Oxford University Press

Bradshaw, C. (2014) Positive behavioral interventions and supports. In Slavin, R.E. (Ed.), *Classroom Management & Assessment* (pp. 99-104). Thousand Oaks, CA: Corwin

Brophy, J., (October 1968): *Teacher influences on student achievement*. American Psychologist, 1069–1077

Cassey, B. (2002). Gender differences in the pattern of teacher-students interaction in secondary Mathematics classroom in Mozambique. In Malcom, C. and Lubisi C*. (Eds). Proceedings of the 10th Annual conference of the Southern Africa Association for Research in Mathematics, Science and Technology Education (pp.41-44),Durban, University of Natal*.

Cohen L, Manion, L & Marrison, K (2000). *Research methods in education*. Newburg Park, NP: Sage.

Cohen L. , Manion, L., Morisson, K. (2006) .*Research methods in education*, 7th ed., New York: Routledge 711 Third Avenue *concepts among Tanzanian secondary schools' students*. Unpublished PhD Thesis, University of Dar-es-Salaam, Dar es Salaam, Tanzania.

Creswell, J. W. (2003). *Research design: Qualitative, quantitative and mixed methods approaches.* Thousand Oaks, CA: S

Delamont, Sara, (1 Nov 2017): Interaction in the Classroom: contemporary sociology of the School. Publisher: Taylor and Francis. London and New York.

Dr. Adnan Ahmed Muslim (1/11/2016): *Social Theories, Sixth lecture Damascus University, Faculty of Art and Humanities*, Department of sociology.

Dr. Adulhussain Rzouki Aljubouri (20/December/2010), by Ahmad Kordy: The concept of Social Behavior. http://kenanaonline.com/users/ahmedkordy/posts/201337

Dr. Ammar Alfetiti (07/02/2017): *Bundora' s Social learning theory*.https:// www.Mein-tv. Net/ TV channel Tunis .

Dunleavy and Others, (1997): *Improving Social Tineraction among 4 Grade Students through Social Skills Instruction* ,USA,

FAWE (2004). Female education in Mathematics and science in Africa. *Tanzania Project Series, 4* ,19-34.

FAWE. (1996). *Workshop for launching the Forum for African Woman Educationalists Mainland Tanzania (pp. 24-25), Dar-es-Salaam, Tanzania.*

Flunders, N. A. (1970). *Analyzing teaching behavior.* London, England: Addison Wesley.

Halima Kadiri (8 June 2012): *classroom interaction between teacher and students in secondary school.* Field studies university of Oran- Algeria. https://revues.univ-ouargla.dz/index.php/number-08-2012/1269-2013-05-26-15-34-41

Handbook of classroom management (2 nd Ed.). New York: Taylor and Francis Group

Hassan Shehata and Abu Amira, (1994): *Teachers and learners, their patterns, behavior and roles Library of the Arab Book House*, Cairo.

Dr.Hassan (2008). *Effectiveness of classroom interaction in education.* Nairobi, Kenya: Jomo Kenyatta Publisher.

Howie, S. and Plomp, T. (2000). School and classroom level factors and students achievement in Mathematics in South Africa. A closer look at the southern Africa: TIMSS-R Data. In C. Malcom and C. Luis (Eds). *Proceedings Of The 10th Annual Conference of Southern African Associations for Research Mathematics, Science and Technology Education Durban, University Of Natal.*

Huberman, A.M. and Miles, M.B. (2002) . *Qualitative researcher's companion*. Thousand Oaks: Sage.

Ifamunyiwa, G. (2008). *Conceptions of mathematics teacher education*. London, England: Sage.

International Journal of Communication 8 (2014) Social Identity Theory 19 Prof. Haidar Hatem Faleh -Ajrash (22/11/2016, 12:32). *Factors affecting the effectiveness of the educational process* BASIC educational College University of Babylon, Iraq http://www.uobabylon.edu.iq/uobcoleges/lnkbroken.aspx

Ishumi, A.G. (2002). *Philosophy of Education*. Dar-es-Salaam,Tanzania: Dar-es-Salaam University Press .

Kahle, J.B. and Meece. J. (1994). Research on gender issues in the classroom. In A. B. Champagne (Ed). *Handbook of research on science teaching and learning.* New York, America : Macmillan. Katunzi, N. And Ndalichako, J. (2002). *Baseline study on factors influencing girls' access to retention and achievement in basic education in selected districts in Tanzania, Kisarawe, Masasi, and Songea Rural*. Unpublished Second Draft Report, UNICEF, .

Kamal Awais (3 May 2018): *Symbolic interactionism* alantologia.com/blogs/8885

Katunzi, N. B. (1992). *The teaching and learning process in Tanzania primary.* Dar- es -Salaam: Tanzania.

Kiwia, S., and Odada, M. (1991). *Improving teacher quality through school practices.* Unpublished Paper, University of Dar-es-Salaam, Dar-es-Salaam, Tanzania.

Kumpulainen, K., Wray, Classroom Interaction and Social Learning (2002). Available from http://books.google.com/books?id=lv1 P1 W41ZLOCand pg= PA2anddq=Delamont+1976

Lumen Learning by multiples individuals and organizations. (Retrieve May 2019) *Reading:* symbolic interactionism *theory*. Sociological Paradigm #3: module one https://courses.lumenlearning.com

Lutege,S. (2008). *Teachers' support that enhance students'mathemtics learning*. Kampala, Uganda: OUP.

M. Kokkinos Charalambous (3 june 2009): *Interpersonal teacher behavior in primary school classrooms. Department of Primary Education*, Democritus University of Thrace, N. Hili, 68100 Alexandroupoli.

Malekela G. A. (2000). The quality of secondary education in Tanzania*;* In J. C. J. Galabawa, F. E. M. K. Senkoro and A. F. Lwaitama, (Eds). *Quality of secondary education in Tanzania* (pp.61-76). University of Dar-es-Salaam,Tanzania: Institute of Kiswahili Research.

Mariki, S. O. (2009). *Guidelines for the formulation of research project dissertations.* Nairobi, Kenya: NCST and IDRC.

Martin (1993): Classroom Management Style ,SUA

Mbilinyi, M. (1990*). Education in Tanzania with a gender perspective*. Dar-es-salaam,Tanzania,: Dar-es-Salaam University Press.

Mbise, A. S. (1976). *Students' participation in Tanzania secondary school classrooms*.Unpublished Master Dissertation, University of Dar-es-Salaam, Dar es Salaam, Tanzania.

Mbunda (1996). The teaching and learning process in Tanzania primary schools. A classroom interaction analysis "phase one: Dodoma Region. Faculty of Education. University of Dar-es-Salaam , Tanzania.

Mckinley, C. J., Mastro, D. and Warber, K.M. (2014). *Social identity Theory as a Framework for Undestanding the Effects Of Exposure to Positive Media Images of Self and Other on Intergroup Outcomes.* International Journal of Communication (19328036),8, 1049-1068. Retrieved from http://ezproxy.montclair.edu:2048 /login?url=http://search.ebscohost.com/login.aspx?direct=true&db=ufh&AN =97253174&site=eds-live&scope=site

Metelo, A. (1998). *Describing classroom interaction*. Retrieved on 3rd march 2011 from *http://www*. salzburgseninar.org/asc/csaac/progs/

Middleton, J.A. and Spanias, P.A.(2013) "Motivation for achievement in Mathematics, Findings Generalization Research", *Journal for Research in Mathematics Education,30*(1), 56-66

Ministry of Education And Vocation Training [MoEVT] (2005). *Mathematics syllabus for ordinary secondary school*. Dar-es- Salaam,Tanzania: Author.

Mmari, G.R.V. (1995*). A study of the understanding of Mathematics ideas and concepts.* Dar es Salaam,Tanzania: TIE.

Morgan D. L. (1998). *Focus group as qualitative research.* Berveley Hill: Sage.

Mpama, R. A. (1984). *Factors influencing mathematics performance in primary schools' students in Tanzania: A case study of Mtwara District*. Unpublished Master Dissertation, University of Dar-es-Salaam, Dar es Salaam, Tanzania.

Mrimi, B. (2005). *How problem-solving tasks work in the Mathematics classroom in relation to developing students' mathematical thinking*. Unpublished master's dissertation, Karachi, Aga KhanUniversity.

Mtana, N., Binde, A., and Mhando, E. (2007). *Teaching mathematics teacher education by using billingual languages*. Dar es Salaam, Tanzania: OUP.

Mtaturu, R. (2011). *Classroom interaction as a factor for girls poor performance in mathematics: The case of selected co-education secondary schools in Ilala Municipality.* Unpublished master Dissertation, University of Dar es Salaam.

Mwinyi, V.(2008). *Contribution of classroom interactions in secondary schools*. Dar es Salaam, Tanzania: TPH.

Naom, S. G. (1998). *Dissertation, research and writing for construction students*. Oxford: Reed Educational and Professional Publishing Limited.

National council of teachers of Mathematics (NCTM), (1989). *Curriculum evaluation: Standards for school Mathematics.* Virginia: National council of teachers of Mathematics (NCTM).

Omari, I. M. (2001). Gender Equity: Issues and interventions in girls' education in Tanzania"*. Papers in Education and Development, 2,* 18-31.

Padayachee,P.(2014) "Elements of Supportive Learning Environments for Mathematics Learner" *Journal of International Research in Education,* 2 (2), 33-47.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd Ed). Newburg Park, CA: Sage.

Punch, F. K. (2000). *Developing effective research dissertations: Essential resources for social research.* New Delhi, India: Sage.

Ropo, G.(2004). *Teaching Mathematics by using ICT.* Pritoria, South Africa: Pritoria University Press. *schools: A classroom interaction analysis*. Tanga,Tanzania : Faculty of Education, University of Dar-es-Salaam.

Sekwao, C. (1998). *Promotion of equal access of girls to science education and technical vocational education in Africa*: *A case of Tanzania*. Dar es Salaam: UNESCO.

Sichizya, H. (1985). *The effects of curriculum change in Tanzania*. Dar es Salaam, Tanzania: OUP

Siti Hamad Mohamad (2013): Professional Development needs Analysis of Secondary Mathemetics teachers in Zanzibar, Tanzania, School of graduate studies, University Putra Malaysia.

Sociologie Chez Abderrahim (26 April 2019): *Sociological Theories* https://www.youtube.com

Some classroom management problems and how to overcome them, www.dr-saud-a.com/vb/showtread

Sugai & Horner, 2002; American Psychological Association [APA] Zero Tolerance Task Force, 2008).

Sugai, G., and Simonsen, B. (2015). Supporting general classroom management: Tier 2/3 practices and systems. In E. T. Emmer and E. J. Sabornie (Eds.),

Tajfel, H. and Wilkes, A. (1963): *Classification and quantitative judgments.* British Journal of Psychology, 54, 101–114.

Tanzania Gender Networking Program. (1993). *Gender Profile of Tanzania*: Dar-es-Salaam,Tanzania : TGNP.

Tasnia Talukder, (August 2011): *Classroom Interaction Influencing Factors for Enhancing SST (Student Talk Time)*. Department of English and Humanities BRAC University, Dhaka, Bangladesh.

UNESCO. (2000).Education for all" and sustainable development in LDCs. *Issue Paper Presentation at the 3rd United Nations Conference on the Least Developed Countries. Project (FEMSA) (T) FAWE.*

United Republic of Tanzania[URT].(1995). Education and Training Policy. Dar es Salaam, Tanzania: MoEC.

Urassa, E. P. (2004). *Education, leadership and learning: Rethinking, access to learning. What is this for Teachers and school leadership?* Retrieved on from http:/www.pfi.uio.No/forsking/netreed/conferences/conf2005/Eliz

Wang, M. C., Haertel, G., and Walberg, H. J., (1993): *Toward a knowledge base of school learning*. Review of Educational Research, 73(3), 249–294.

Wangeleja, M. J. (2004*.Towards designing professional development programs for primary Mathematics teachers.* Unpublished Master Dissertation, University of Dar-es-Salaam, Dar-es-Salaam, Tanzania.

Webb, N. M., Troper, J. D., and Fall, R.. (1995): *Constructive activity and learning in collaborative small groups.* Journal of Educational Psychology, 87, 406–423.

Webb, N. M.. (1991): *Task-related verbal interaction and mathematics learning in small groups.* Journal for Research in Mathematics Education, 22, 366–389.

Weinert, F. E., Schrader, F.-W., and Helmke, (1989): *A Quality of instruction and achievement outcomes*. International Journal of Educational Research, 13, 895–914,

Wong, Harry K. (2016). *The First Days of School: How to be an Effective Teacher*. Mountain view, CA : Harry K. Wong Publications

Xuehui An, Emily Hannum, Tanja Sargent (2007): *China, Teaching Quality and Student Outcomes: Academic Achievement and Educational Engagement in Rural Northwest China,* An International Journal NUS Press Pte Ltd Volume 5, Number 2, September

Yin, J. (2008). *Introduction of education research.* London, England: Sage.

Zhu, G., Kayinga, V., Zizzou, J. and Khan, R.(2007). *Techniques for writing research reports*. Lusaka, Zambia: Sage.

APPENDICES

APPENDIX 1

TRANSMITTAL LETTER

KAMPALA INTERNATIONAL UNIVERSITY

EXPLORING THE HEIGHTS

Ggaba Road, Kansanga * PO BOX 20000 Kampala, Uganda
Tel: +256772365060 Fax: +256 (0) 41 - 501974 E-mail:
dhdrinquiries@kiu.ac.ug * Website: http://www.kiu.ac.ug

Directorate of Higher Degrees and Research
Office of the Director

Our ref. 1174-07096-12557 **Monday 18th February, 2019**

Dear Sir/Madam,

RE: INTRODUCTION LETTER FOR ASMAA ELSAYED EMARA
REG. NO. 1174-07096-12557

The above mentioned is a student of Kampala International University pursuing a Masters degree in Educational Administration and Management.

She is interested in conducting a research for her dissertation titled, "*Teacher Classroom Interaction Behaviour and Students' Mathematics Academic Performance in Secondary Schools Makindye Division, Kampala Uganda*"

Your organization has been identified as a valuable source of information pertaining to the research subject of interest. The purpose of this letter therefore is to request you to kindly cooperate and avail the researcher with the pertinent information she may need. It is our ardent belief that the findings from this research will benefit KIU and your organization.

Any information shared with the researcher will be used for academic purposes only and shall be kept with utmost confidentiality.

I appreciate any assistance rendered to the researcher

Yours Sincerely,

KAMPALA INTERNATIONAL UNIVERSITY
KIU
18 FEB 2019
DIRECTOR
DHDR
P.O. BOX 20000, KAMPALA

Dr. Claire M. Mugasa
Director

C.c. DVC Academic Affairs
Principal CEODL

"Exploring the Heights"

APPENDIX II

LETTER TO THE RESPONDENTS

Dear Sir/Madam,

Greetings!
I am Asmaa Elsayed Emaraa master's student of Education Administration and Management of Kampala International University. Part of the requirements for the award is a dissertation. My study is entitled, Teacher Classroom Interaction Behaviour and Students' Mathematics Academic Performance in Public Secondary Schools Makindye Division, Kampala, Uganda**.** May also I request you to participate in this study by answering all questions. Any data you will provide shall be for academic purposes only and no information of such kind shall be disclosed to others.

I shall be much obliged if my humble request shall meet your kind consideration.

Yours Faithfully,

ASMAA ELSAYED EMARA

1174-07096-12557

APPENDIX III

INFORMED CONSENT

In signing this document, I am giving my consent to be part of the research study of Asmaa Elsayed Emara that will focus on Teacher Classroom Interaction Behaviour and Students' Mathematics Academic Performance in Public Secondary Schools Makindye Division, Kampala, Uganda.

I shall be assured of privacy, anonymity and confidentiality and that I will be given the option to refuse participation and right to withdraw my participation anytime.

I have been informed that the research is voluntary and that the results will be given to me if I ask for it.

Name and Signature of Respondent

Date______________________

APPENDIX IV

QUESTIONNAIRE

SECTION A, DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

DIRECTIONS: Please help us clarify your response by supplying the following facts about yourself.

Students

1. Your Gender: Male________ Female __________
2. Your Age: 13-15 years_____ 16- 18 years_____19 -21 years____ above 21 years____
3. Your mathematics total score last term (third term 2018) ____________ marks/100

Your Math Teacher's profile characteristics

4. Gender: Male________ Female___________
5. Qualification; Diploma_____ Degree______ Masters____ I Don't know____
6. Marital Status: Single ______ Married ______ I Don't know______
7. Age; 20-39 years _____ 40 -59 years______ 60 years and above____ I Don't know____
8. Years of your current math teacher has taught you: 1year______ 2 years______ 3 years

SECTION B. TEACHER CLASSROOM INTERCATIVE BEHAVIOUR

Please give your rating at the end of each option which corresponds to your best choice in terms of teacher classroom interaction behavior/practices while teaching you mathematics. Kindly this key to answer; 4=Strongly Agree (SA); 3=Agree (A); 2= Disagree (D); 1=Strongly Disagree (SD)

Your mathematics teacher always…. Part I. Classroom Management	SA	A	D	SD
1. begins classes on time and ends on time	4	3	2	1
2. makes roll calls from the class register.	4	3	2	1
3. arranges the class room well to avoid crowding and obstruction	4	3	2	1
4. actively interacts with students and supervises what they do	4	3	2	1
5. sets classroom rules together with students	4	3	2	1
6. frequently observes and engages students in the teaching learning process	4	3	2	1

7. allows students to ask questions in relation to the topic he is teaching	4	3	2	1
8. comes to class well prepared (with all tools to use and exercises)	4	3	2	1
9. gives extra time and assistance to students who have not understood	4	3	2	1
10. gives exercises, marks & makes corrections with you	4	3	2	1
11. uses minimum harshness to deal with students who break class/school rules	4	3	2	1
12. uses and calls correctly student names in class interactions	4	3	2	1
13. talks to students with respect even when giving corrections	4	3	2	1
Part II: Lesson Development: Your math's teacher always….				
1. Comes to class with a lesson plan	4	3	2	1
2. Follows a clear mathematics curriculum.	4	3	2	1
3. Discusses mathematics content outline with students	4	3	2	1
4. links previous lesson with current lesson	4	3	2	1
5. encourages students participation in class .	4	3	2	1
6. begins math lessons with interesting question	4	3	2	1
7. begins math lessons with interesting picture/diagram	4	3	2	1
8. allows learners to give explanations in class	4	3	2	1
9. links mathematics content to real daily life examples	4	3	2	1
10. guides learners to make groups and always gives group work	4	3	2	1
Part II: Materials Use Your math teacher always….				
1. Use modern text book for mathematics	4	3	2	1
2. use clear charts/manila papers to show mathematical examples	4	3	2	1
3. Use locally made materials	4	3	2	1
4. Some times uses projector to teach math	4	3	2	1
5. use mathematical rulers to make angles and other diagrams	4	3	2	1
6. use scientific calculators to show mathematics example	4	3	2	1

APPENDIX V

INTERVIEW GUIDE

1. How long have been teaching mathematics?

2. Do your students follow classroom rules and regulations?

3. How do teachers deal with disruptive behaviour e.g. failure of students to complete exercises and others

4. Do your students perform well in mathematics? If yes, why? If no, why?

5. What do you think needs to be done to improve the performance of students in mathematics?

6. What steps do math teachers in this school take to create good relationship with students?

7. How would you describe the interactive behaviour of math teachers in your department?

8. Describe briefly the factors that contribute to students' success in math?

9. How do you handle occurrences of uncertainties?

10. What strengths have you identified among your math teachers regarding their interactive behaviour?

11. What do you dislike about the interactive behaviour of your math teachers?

12. How do you describe the performance of students in math in this school?

13. Comment on the extent of material use by the teachers of math in this school.

14. Comment on the extent of lesson development by the teachers of math in this school

15. Comment on the extent of classroom management by the teachers of math in this school

APPENDIX VI

OBSERVATION CHECKLIST

The following are the items that the researcher will observe about teacher classroom interactive behavior

SECTION B; TEACHER CLASSROOM INTERACTIVE BEHAVIOUR

Part1. Classroom Management	**Don e**	**Not done**	**Comment**
1. Time management.			
2. Roll calling			
3. Classroom arrangement			
4. Teacher-Student interaction			
5. Student observing classroom rules			
6. Holding question and answer sessions			
7. Coming to class well prepared (with all tools to use and exercises)			
8. Attending to students who have not understood			
9. Giving exercises, marking and making corrections with students			
10. Dealing with students who break rules			
11. Calling students names correctly in class interactions			
12. Talking to students respectfully when giving corrections			
13. Students' expectations from teachers			
14. Maintaining proper eye contact with student when interacting			
15. Encouraging students to be respectful one another			
Part II: Lesson development: The teacher always …			
1.Coming to class with a lesson plan			
2.Following a Clear mathematics curriculum			
3.Discussing mathematics content outline with student			
4.Linking previous lesson with current lesson			
5.Encouraging students participation in class			
6. Beginning math lessons with interesting question			
7. Beginning math lessons interesting picture/ diagram			
8. Allowing learners to give explanations in class			
9. Linking math content to real daily life examples			
10. Guiding learners to make groups and always give group work			
11. Stimulating learners' interest in math			
12. Building learners' critical thinking			
13. Encouraging creativity and self-expression in students			
Part III: Materials use The Teacher always			
1.Using modern text book for information			
2.Using clear charts/manila papers to show mathematical examples			
3.Using locally made materials			
4.Using projector or electronic equipment to teach math			
5.Using mathematical rulers to make angles and other diagrams			
6.Using scientific calculators to show math's examples			

APPENDIX VII

PERFORMANCE OF MATHEMATICS IN UCE

Table 1:1 Shows the performance of mathematics in UCE

Year	2015	2016	2017
Student sat	4800	5832	5973
Students passed	1200	2146	2321

Source: Makindye Division Education Office

APPENDIX VIII

MAP SHOWING MAKINDYE DIVISION

APPENDIX IX

COMPUTATION OF SAMPLE SIZE

Using Slovene's formula of sample size determination the following sample were extracted from population

$$n = \frac{N}{1+N(e)2}$$

$$n = \frac{1005}{1+1005(0.05)^2}$$

$$n = \frac{1005}{1+1005(0.0025)}$$

$$n = \frac{1005}{3.51}$$

n= 286

Where:

n = Sample Size

N = population

e = Error in Research (0.05)

APPENDIX X
PERMISSION LETTER FROM KCCA TO COLLECT DATA FROM SELECTED PUBLIC SECONDARY SCHOOLS IN MAKINDYE DIVISION

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

MAKINDYE DIVISION URBAN COUNCIL
OFFICE OF THE TOWN CLERK
TEL: 0204660063

MKD/KCCA/201/17

20th February 2019

The Ag. Supervisor Education and Social Services
Makindye Division

INTRODUCING MS. ASMAA ELSAYED EMARA

This is to introduce to you the above named student of Kampala International University, currently pursuing a Bachelor's a Master's Degree in Educational Administration and Management.

She is carrying out a research project, as partial fulfillment of the requirements for the study program, and would request to get information from your Office.

The purpose of this letter is to request you help her get the information she requires.

Any assistance rendered to the student is highly appreciated.

Joanita Ssonko
AG. TOWN CLERK

OFFICE OF THE TOWN CLERK
KAMPALA CAPITAL CITY AUTHORITY
20 FEB 2019
MAKINDYE DIVISION URBAN COUNCIL

P.O. Box 7010 Kampala - Uganda

KCCA
KAMPALA CAPITAL CITY AUTHORITY
For a better City

The government Aided secondary schools include the following

SECONDARY GOVERNMENT AIDED SCHOOL

S/N	SCHOOL NAME	HEAD TEACHER	CONTACTS	LOCATION
1	KIBULI SSS	KINENE MUHAMMAD	0772412219	KIBULI
2	ST.DENIS SSEBUGWAWO SS	SR. SANYU	0772413065	GGABA
3	ST.PETERS NSAMBYA SS	MUNGERE R	0772421301	NSAMBYA
4	KANSANGA SEED SCHOOL	MOHAMED KIYINGI	0752631815	KANSANGA

KAMPALA CAPITAL CITY AUTHORITY
EDUCATION AND SOCIAL SERVICES
2 5 FEB 2019
DIRECTORATE
MAKINDYE DIVISION URBAN COUNCIL

APPENDIX XI

SCHEDULE OF CLASSES

School	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
St Denis Secondary School			6/3/2019 8:9, 20 Senior4 East		15/3/2019 11:12 AM Senior 4 West
St Peter Secondary School	4/3/2019 9,20:10,40AM Senior 4	5/3/2019 9,20:10,40 AM Senior4			1/3/2019 2,20: 3,40 Senior 4
KKCA Secondary School		19/3/2019 9:10 Senior 4 East ……………………. 26/3/2019 2:3,40 Senior 4	20/3/2019 9,20:10,40 Senior 4 west		
Kibuli Secondary School	25/3/2019 7,20:8,40 Senior 4 ……………….. 11,40:12,5 Senior 4	26/3/2019 8,40:10 Senior 4		14/3/2019 7,20:9 Senior 4 East	

APPENDIX XII

PICTURES TAKEN DURING THE DATA GATERING

In the one of classrooms where a student was solving giving opportunities to solve mathematical equation by the teacher which was setting behind to observe the students and others students. (Interactive behavior within Classroom management).

Photo for one class while the teacher was giving the students exercises from extra exercises book.

One of the classrooms where the teacher after he explained the lessons for the students, he gave mathematical exercises for them to apply what he explained (Lesson development)

One of the teachers during teaching algebra lesson within the class and the students with attention with the exercises which was written on the blackboard

One of the teachers explains the lesson to the students using a hand-made model to make sure the students are absorbed to the lesson. (Material Use)