RELATIONSHIP BETWEEN SECONDARY SCHOOL MATHEMATICS TEACHERS' CLASSROOM MANAGEMENT PRACTICES, SELF-EFFICACY AND STUDENTS' PERFORMANCE IN MATHEMATICS IN NIGER STATE, NIGERIA

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ABSTRACT

The study determined the Relationship between Secondary School Mathematics Teachers' classroom management practices and self-efficacy towards teaching and Students' Performance in Mathematics in Niger State, Nigeria. The researchers used a correlational research design for this study. A multistage sampling technique was employed for selecting the twelve (12) schools used for the study. Two corresponding research questions guided the study. A total of one hundred and forty (140) mathematics teachers formed the sample size of the study. The research instrument used for data collection is a 5 points Likert scale type questionnaire which was pilot tested. Cranach Alpha statistical tool was used for analysis and average reliability of 0.75 was obtained using SPSS version 23 for the analysis. During data collection, questionnaires were administered to the sampled mathematics teachers by the researchers with the help of research assistants from each of the sampled schools. Mean and Standard Deviation was used to analyze the data collected to answer the research questions raised for the study. The study revealed that Mathematics teachers' classroom management practices and self-efficacy towards teaching are both teachers' variables that influence students' performance in mathematics. It was recommended that mathematics teachers should be encouraged to go for further training or to attend conferences, seminars, workshops so as to be well skilled in terms of Mathematics teachers' classroom management practices and self-efficacy towards teaching.

Key Words: Classroom, Management, Mathematics, Performance, Self-efficacy, Students and Variable.

INTRODUCTION

Mathematics is a branch of science concerned with study of numbers, shapes, structure, quality, data, measurements and logical representation of activities. This means that, mathematics is concerned with the concept and processes of counting, calculation, measurement, logical

reasoning and systematic study of shapes and motions of physical objects. In studying Mathematics therefore, one is expected to seek out patterns, formulate new conjectures and establish facts by rigorous deduction from appropriately chosen axioms and definitions. From the foregoing, it has become cleared that knowledge of Mathematics is of paramount importance in every aspect of human life. For instance, Wittmann (2019) asserted that, knowledge of Mathematics is a prerequisite in the field of medicine, engineering, finance, natural science and social sciences to mention a few. This therefore, is a clear indication that, Mathematics is an essential school subject since it is relevant in all fields of human endeavors. This is why Mathematics is one of the core and compulsory subjects at both primary and secondary school levels of education in Nigeria.

Despite the importance of the knowledge Mathematics for individual and national development, secondary school students' performance in Mathematics has not been good enough as reported by Ugwuanyi, (2014) and Issau *et al*. (2017). In order to address this challenge, many research studies have been conducted and many factors have been identified to be responsible for low or poor performance of secondary school students in Mathematics. For instance, Salman *et al*. (2012), Badru (2015) and Issau *et al*. (2017) identified major causes of students failure in Mathematics to include, Government factors, teachers' factors, students' factor, parents and community factors to mention a few. From the above findings, it is disheartening to observe that teachers' factors or teachers' variable has been identified as one of the major factors responsible for low or poor performance of secondary school students in Mathematics. Teachers' factors or teachers' variables has become an issue of serious concern to all the Mathematics education stakeholders. There are many Mathematics teachers' variables which either positively or negatively affects students' performance. Some of them include pedagogical knowledge, attitude, teaching experience, classroom management practices, qualification, and content

knowledge among others. This study focused on two teachers' variables which are Mathematics teachers' classroom management practices and self-efficacy towards teaching.

Teachers' classroom management style refers to the teachers' ability to manage his or her classroom effectively during instruction. This implies that a teacher is expected to apply courageous and motivational techniques in improving students' comprehension and maintaining discipline in the classroom during instruction. Classroom management is simply seen as a process of maintaining discipline in the classroom during teaching by a teacher through the use of different instructional strategies. Effective classroom management can provide a favourable atmosphere for effective and efficient teaching and learning. Effective classroom management can make learning more meaningful as communication between teachers and students would be clearer (Rahman and Lee, 2014).

Effective classroom management is implicitly seen as a psycho-social process that put teachers and students into an effective academic relationship. Effective classroom management is important and can be used as a conducive and convenient environment of conveying knowledge, skills, feelings and thoughts from teachers to students. This can be done effectively using empathy and respect either through body language or through other means understandable by the students. Effective classroom management helps in building as well as fulfilling relationships that makes learning easy, meaningful, effective and efficient. A teacher being a centre of changes in education needs to maintain maximum discipline in his classroom in order to be able to impart knowledge and skills to the students efficiently, effectively and successfully. Because of the above and many importance of effective classroom management practices, teachers must continually undergo refresher courses or programs so as to improve on their classroom management for effective instruction (Koroka *at al.,* 2018). Teachers must be ready to learn and become well developed in terms of ability to manage his or her classroom and maintaining

discipline of students during teaching because, the teachers' personality traits has a significant impact on students.

Another important variable this study focused upon is teachers' self-efficacy as it is one of the teachers' variable that has been reported to have either direct or indirect relationship with students' performance. Self-efficacy according to Chiu and Klassen (2010a) is defined as one's beliefs about his or her ability to perform a specific task. This implies that Self-efficacy influences one's perception, skill as well as ability to be effective and competent in carrying out a specific task. Mathematics teachers' self-efficacy level can be used to predict his or her ability to effectively implement Mathematics curriculum. In a more broaden and simpler term, Mathematics teachers Self-efficacy is simply seen as the teachers' confidence and capability in implementing the Mathematics curriculum effectively and successfully hence, improving Mathematics students' performance. Mathematics teachers' self-efficacy is also dependent on their teaching experience. This implies that, teaching experience of teachers influences the formation of self-efficacy which in turn, influences their classroom practices. Mathematics teachers' self-efficacy may sometimes be at variance with a particular topic and teaching methods recommended for teaching the topic but, teachers with high self-efficacy will still strive and successfully achieve the stated objectives. This implies that teachers' high self-efficacy contribute to the formation of students' high self-efficacy in the learning subject (Peter *et al.,* 2019). This study therefore, determined the relationship between mathematics teachers' classroom management practices and self-efficacy towards teaching and mathematics students' performance.

Statement of the Research Problem

Mathematics is a science subject which plays a pivotal role in technological advancement of an individual as well as a nation. For instance, knowledge of Mathematics is always needed in the areas of internet technology, banking, medicine, scientific discoveries, daily, quarterly and

annual planning and innovation. Mathematics therefore, is a science subject that performs an interdisciplinary function. Because of the importance of the knowledge of Mathematics, it is now a policy in Nigeria that no candidate can get admission into any higher institution of learning without obtaining at least a credit pass in Mathematics. This is one of the reasons why Mathematics is made a core and compulsory subject at both primary and secondary schools in Nigeria (FRN, 2014). But, it is unfortunate to observe that despite the importance attached to Mathematics in the national policy on education, students still records poor performance in Mathematics especially at Senior School Certificate Examinations (SSCE) level (Gaudence *et. al*, 2013). In order to address this problem, research studies have been conducted and researchers have identified teachers' variables (such as teachers' classroom management, Self-efficacy and school location to mention a few) among other factors that are responsible for this ugly trend.

Mathematics teachers therefore, have been encouraged to apply various teaching strategies at various educational levels to improve classroom instruction in Nigeria, but, Mathematics students' poor performance still persists. Therefore, as a step towards addressing this persistent problem, this study determined the relationship between Secondary School Mathematics Teachers' classroom management practices and self-efficacy towards teaching and Students' Performance in Mathematics in Niger State, Nigeria. Findings of this study can be used as yard stick to conclude whether Mathematics teachers' variables are actually responsible for Mathematics students' poor performance or not.

Objectives of the Study

The aim of this study is to determine the Relationship between Secondary School Mathematics Teachers' classroom management practices and self-efficacy towards teaching and Students' Performance in Mathematics in Niger State, Nigeria. Specifically, the study was carried out to achieve the following objectives by determining the:

i. relationship between Mathematics teachers' classroom management practices and students' performance in Mathematics

ii. relationship between Mathematics teachers' self-efficacy towards teaching and students' performance in Mathematics

Research Questions

Based on the foregoing objectives, the following research questions were raised and answered using mean and standard deviation:

i. what is the relationship between Mathematics teachers' classroom management practices and students' performance in Mathematics?

ii. what is the relationship between Mathematics teachers' self-efficacy towards teaching and students' performance in Mathematics?

Literature Review

Many related literatures were reviewed on mathematics teachers' classroom management practices, self-efficacy and students' performance. For instance, Rahman and Lee (2014) assessed the views of the teachers on classroom management and communication in teaching and learning Mathematics. The study involved thirty-six mathematics teachers from nine primary schools in Balik Pulau. Three areas of teachers' view on classroom management and communication, understanding topics in mathematics and having a lesson plan based on the pupils' level of understanding were considered. Findings indicated that 86% of the teachers believed that classroom management and communication occurs in teaching and learning mathematics when both teacher and pupils in classroom management were communicating and listening to each other. 39% of the teachers opined that pupils were able to comprehend the lesson taught by the teacher and solve moderate level questions given to them while 36% of the teachers established that pupils were capable of understanding but they had to be guided by the teacher in solving moderate level led questions given to them. The findings on preparation of lesson plan showed

that 31% of the teachers stated that in a properly managed classroom, teachers communicated better when they were using appropriate teaching instruments, using language that was easy to comprehend and inspire pupils to take part in group discussions or arguments. Teachers also need to effectively manage their classrooms to be able to communicate with the pupils using words simple enough to help pupils understand better. By implication, there is a relationship between teachers' classroom management practices and students' performance.

Abouzeid (2014) conducted a research on the relationship between teachers' classroom management and communication skills and their attitudes towards teaching profession. This research is a descriptive study and the sample for the research consists of students at the departments of Turkish language teaching at the universities in the Turkish Republic of Northern Cyprus. The instruments used to collect the data for the research in a well managed classroom were "Teacher Communication Skills Scale" and "Scale for Attitudes towards Teaching Profession". The data obtained was analysed using the statistical analysis, standard deviation, The Pearson Product Moment Correlation Coefficient and independent samples t-test techniques were used. As a result of the research, significant difference in communication ability and affection sub-dimension in a well managed classroom was determined according to gender independent variable; it was also determined that there is a significant correlation in a positive way between communication ability or skills and affection sub-dimension; between communication ability and harmony sub-dimension; and between communication skills and attitude towards teaching profession all in a well managed classroom. Results of this study indicated that teachers' effective classroom management ability is a determinant of students' performance.

On mathematics teachers' self-efficacy and students' performance, literatures reviewed include the work of Tella (2008) examined the relationship between Teacher factors (self - efficacy) and pupils' academic achievement in primary school mathematics. The participants of the study consist of

254 primary school teachers and 120 pupils. Data collected on the study were analyzed using as stepwise multiple regression analysis. The results reveals that teacher self – efficacy and interest had significant correlation with pupils achievement scores. Teacher's self-efficacy was the best predictor of pupils' academic achievement in mathematics followed by teachers' interest. The other factors attitude, qualification and experience were not significantly correlated to pupil's achievement in mathematics.

Skaalvik *et al.* (2015) assessed the impact of teacher support and student self-efficacy on students' grades in mathematics and mathematics motivation. Eight hundred and twenty three (823) middle school students in Norway were used for the study and analysis was done using multiple regression and SEM analysis. Motivational indicators examined were intrinsic motivation, persistence, effort and help seeking behaviour. The findings revealed that the relation among students' grades and their motivation were highly mediated through self-efficacy and emotional support.

METHODOLOGY

This research used a correlational research design. Total population of teachers in the study area is three thousand, one hundred and thirty five (3,135) teachers. Target population on the other hand comprises of 893 Secondary school Mathematics Teachers. A multistage sampling technique was employed for this study. The first stage involved random sampling by balloting of two (2) Local Governments Areas each from the three Senatorial Zones of the State. This gave a total of six (6) Local Government Areas that were used for the study. Two (2) public secondary schools were purposively selected from each of the six (6) Local Government Areas selected for the study based on school location. All the mathematics teachers in all the sampled schools were used for the study. The sample size of the study is one hundred and forty (140) mathematics teachers.

The research instrument used for this study is a 5 points Likert scale type questionnaire designed by the researchers to generate data used to answer the research questions. The questionnaire have responses and weighing ranging from Highly Knowledgeable (HK) = 5, Mostly Knowledgeable (MK) = 4, Partially Knowledgeable (PK) = 3, Low Knowledgeable (LK) = 2 and Not Knowledgeable (NK) = 1 with decision mean of 3.00. On the other hand, questionnaire on research question two is based on a 4 - point scale with responses and weighing from Completely Responsible (CR) = 4, Mostly Responsible (MR) = 3, Partially Responsible (PR) = 3 and Not Responsible (NR) = 1 with decision mean of 2.50.

The questionnaire was validated by experts in the areas of Mathematics, Mathematics Education as well as Test and Measurement unit. The experts made some corrections, suggestions and observation about the instrument which were used by the researchers to produce the final copy of the instrument used for the study.

A pilot test was conducted to determine the reliability of the questionnaire (instrument) using split half method. Twenty (20) Mathematics teachers were used. Data collected were analyzed using SPSS 23 software. Cranach's alpha statistical tool was used to determine the reliability coefficient of the questionnaire. Reliability coefficient obtained for research question one (Mathematics Teachers' Content Knowledge) is 0.72 and that of research question two (Mathematics Teachers' Pedagogical Knowledge) is 0.78. Average of the above reliabilities coefficients was calculated and found to be 0.75 (0.72 + 0.78 = 1.5 / 2 = 0.75). This value is an indication that the instrument is consistent and reliable.

Data was collected by administering the questionnaires to the sampled mathematics teachers by the researchers with the help of research assistants from each of the sampled schools. Mean and Standard Deviation were the statistical tools used for data analysis as well as answering the research questions.

RESULTS AND DISCUSSION

Research Question One: what is the relationship between Mathematics teachers' classroom management practices and students' performance in Mathematics? To answer this research question, mean and standard deviation were used and the result is presented in Table 1

Table 1. Mean and Standard Deviation of Mathematics Teachers' Classroom Management Practices

S/N	Items on Research Question One	N	MEAN	SD	DECISSION
1	Use of corporal punishment to maintain discipline in the classroom during instruction	140	1.94	0.44	Not a Barrier
2	Preventing students from unnecessary movement out or into the class to avoid distraction during instruction	140	1.20	0.30	,,
3	Remaining calm, focused and consistent during instruction t maintain peace in the class during instruction	140	1.21	0.30	,,
4	Avoiding lateness to class and punishing the late comers to the class to maintain a full control of the class during instruction	140	1.94	0.45	,,
5	Use of different but relevant teaching strategies to teach a particular topic so as to carry every student along during instruction	140	2.00	0.59	,,
6	Paying attention promptly to and providing answers to the confused students in the class to avoid roundness during instruction	140	2.00	0.59	,,
7	Inculcating moral values and positive behaviours to the students in form of advice during instruction	140	2,07	0.56	,,
8	Reporting to the school authority students who consistently exhibit serious acts of indiscipline during instruction	140	1.95	0.45	,,
9	Establishing a caring and mentoring relationships with all the students in the class during instruction as a means of motivation	140	2.01	0.46	,,
10	Directing questions to students who are inattentive in the classroom to maintain orderliness in the class during instruction	140	2.14	0.81	,,
11	Praising and recognizing well-behaved students in the class during instruction	140	2.06	0.56	,,
12	Rewarding st15udents who perform very well in the classroom during instruction	140	1.34	0.34	,,
13	Promoting teacher students interaction in the class to maintain a full control of the class during instruction	140	1.94	0.45	,,
14	Encouraging students generally to embrace collaborative and team work to avoid noise-making in the class during instruction	140	2.06	0.56	,,
15	Encouraging students to participate in discussions on curren affairs related to the topic of teaching in the classroom during instruction	140	1.70	0.43	,,

		1.84	0.50	
GRAND TOTAL		**1.84**	**0.50**	**,,**

Table 1 shows the mean and standard deviation of mathematics teachers' classroom management practices. The table indicates that, in all the items the highest mean is 2.14 with standard deviation of 0.81 while the lowest mean is 1.20 with standard deviation of 0.30. The decision mean is 2.50 meaning that both the lowest and highest means are lower than the decision mean of 2.50. In addition, the grand mean is 1.84 with standard deviation of 0.50 which is also lower than the decision mean of 2.50. This result therefore indicates that mathematics teachers' classroom management practices is not one of the teachers' variables that serves as a barrier to students' performance in mathematics. By implication therefore, a relationship exists between Mathematics teachers' classroom management practices and students' performance in Mathematics.

Research Question Two: what is the relationship between Mathematics teachers' self-efficacy towards teaching and students' performance in Mathematics? To answer this research question, mean and standard deviation were used and the result is presented in Table 2

Table 2. Mean and Standard Deviation of Mathematics Teachers' Self-Efficacy

S/N	Items on Research Question Two	N	MEAN	SD	DECISSION
1	Inability to confidently prepare a proper lesson plan before instruction	140	3.81	1.70	Influential
2	Lateness to class demonstrating a bad quality of teacher due to lack of confidence	140	3.74	1.65	,,
3	Carelessness towards students' behaviours during instruction due to lack of confidence	140	3.67	1.62	,,
4	Poor response to students' questions during instruction	140	3.79	1.68	,,
5	Low personal confidence as a teacher during instruction	140	3.72	1.64	,,
6	Poor human relation particularly with students	140	3.66	1.61	,,
7	Carelessness in handling students' continuous assessment due to lack of confidence	140	3.76	1.66	,,
8	Lack of confidence to pay proper and adequate attention to teaching	140	3.72	1.64	,,
9	Lack of monitoring of the students to ensure they do their homework and assignments regularly	140	3.58	1.47	,,
10	Lack of confidence in handling their students and teaching as a professional teacher	140	3.67	1.62	,,
11	Reluctant response towards Mathematics teaching	140	3.64	1.60	,,

	due to lack of self-confidence as a teacher				
12	Develops natural hate in teaching Mathematics due to lack of confidence to be innovative as a teacher	140	3.66	1.61	,,
13	Less confidence in using a combination of audio aids, visual aids, games and real-life examples in teaching	140	3.70	1.62	,,
14	Reluctant in listening patiently to important questions from the students during instruction because he or she is scared by the question	140	3.57	1.48	,,
15	Inability to motivate students even by words of encouragement as a confident teacher	140	3.49	1.45	,,
	GRAND TOTAL		**3.48**	**1.60**	**,,**

Table 2 Show the mean and standard deviation of mathematics teachers' self-efficacy. The table indicates that, in all the items the highest mean is 3.81 with standard deviation of 1.70 while the lowest mean is 3.49 with standard deviation of 1.45. The decision mean is 3.00 meaning that both the lowest and highest means are greater than the decision mean of 3.00. In addition, the grand mean is 3.48 with standard deviation of1.60 which is also greater than the decision mean of 3.00. This result therefore indicates that mathematics teachers' self-efficacy is one of the teachers' variable that influences students' performance in mathematics. Implicitly therefore, the study has established that, a relationship exists between Mathematics teachers' classroom management practices and students' performance in Mathematics.

FINDINGS AND DISCUSSION

Result of this study has established that:

1. Mathematics teachers' classroom management practices is one of the teachers' variable

that negatively or positively influences students' performance in Mathematics

2. Mathematics teachers' self-efficacy towards teaching is also one of the teachers'

variables that negatively or positively influences students' performance in Mathematics

Research question one indicates that Mathematics teachers' classroom management practices influence students' performance in Mathematics. This finding is in line with the findings of Rahman and Lee (2014) who reported that, 86% of the teachers believed that classroom management and communication occurs in teaching and learning mathematics when both teacher

and pupils in classroom management were communicating and listening to each other. In addition, the finding is also in line with the findings of Abouzeid (2014) who conducted a research on the relationship between teachers' classroom management, communication skills and attitudes towards teaching profession and reported that, teachers' effective classroom management ability is a determinant of students' performance.

In addition, research question two also indicates that mathematics teachers' self-efficacy towards teaching is another Mathematics teacher' variables that influences or is responsible for students' performance in mathematics. This finding is in line with finding of Tella (2008) who examined the relationship between Teacher factors (self - efficacy) and pupils' academic achievement in primary school mathematics. Result of that study revealed that, teacher's self-efficacy was the best predictor of pupils' academic achievement in Mathematics. This finding is also in line with finding of Skaalvik *et al.* (2015) who assessed the impact of teacher support and student self-efficacy on students' grades in mathematics and mathematics motivation and reported that, relationship among students' grades and their motivation were highly mediated through self-efficacy.

Recommendations

From the findings, of this study, it is hereby recommended that Mathematics teachers should be encouraged to go for further training or to attend conferences, seminars, workshops so as to be well skilled in terms of classroom management and self-efficacy towards teaching.

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