

TEACHERS' SKILLS AS PREDICTORS OF STUDENTS' ACADEMIC ACHIEVEMENT IN MATHEMATICS IN OGUN STATE, NIGERIA.

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Abstract

Teachers have a major role to play in ensuring full implementation of school objectives in every country. Teacher's teaching skills are vital to academic success and failure of students. Student's achievement is a reflection of teachers' skills. This study examined teachers' skills as predictors of students' academic achievement in Mathematics in Ogun State, Nigeria. The study adopted survey design. The sample for the study consisted of four hundred and twenty (420) respondents consisting of seventy (70) teachers and three hundred and fifty (350) students, randomly selected from seven public secondary schools in four local government areas in Ogun-Central senatorial district in Ogun-State. Purposive Sampling Technique was used to select the seven (7) schools. Fifty (50) students and ten (10) teachers were randomly selected from each school. Two instruments used for data collections are: Teachers' skills of Commitment, Motivation and Communication Questionnaire (TSCMCQ, $r = 0.68$) and Mathematics Achievement Test (MAT, $r = 0.74$). Four hypotheses were formulated and tested at 0.05 level of significant. Data collected were analyzed using Multiple Regression Analysis (MRA). The result of the study showed those teachers' skills of commitment, motivation and communication when taking together, will significantly predict students achievement in mathematics. It was recommended among others, that teachers should be motivated to participate actively in in-service training programs and workshops to update their knowledge and pedagogical skills.

Keywords: Teachers, Skills, Communication, Commitment, Motivation.

1 Introduction

Mathematics is described as the queen and servant of all school subjects, because it cuts across the school curricula (Fajemidagba, 2006). According to Akinsolu (2014), mathematics is an integral part of everyone's life and virtually affects every field of human endeavor. Reports from different researches have described a poor state of Nigerian students in terms of mathematics achievement. Maduaburn & Odili (2006) and Ashikhia (2010) in separate studies revealed low academic achievement of students in Mathematics. However, for a way forward to be sort for, the causes of how our educational system has led us towards this path of failure must be reviewed. Ashikhia (2010) attributed some teacher's personality factors and student's factors as some of the root causes of the undesirable poor achievement of students in mathematics. An important teacher's factor established by researchers for addressing students' failure in mathematics is teacher's teaching skills.

Teachers play important role in ensuring quality education delivery. A good teacher must exhibit the required teaching skills and accommodate students' social and emotional needs (Williams, 2003). Varieties of skills are needed by teachers for good teaching in classroom setting. Teaching skills are specific instructional activities and procedures that a teacher may use in his classroom during teaching and learning process (Charanjit, 2014). Effective teaching entails good teaching skills such as good communication, good classroom management, enthusiasm, motivation and commitment (Ehinderro & Ajibade, 2000).

Teachers' skills of good communication are the basic need of academics success of students (Feras, 2015). Communication skills involve listening and speaking as well as reading and writing. Effective communication skills are important for teachers in transmitting information and management of interaction with students in the classroom (Alamgir, K.; Salahuddin, K.; Syed, Z. & Manzoor, K., 2017). According to Farrell (2009), teachers use communication in the classrooms in order to accomplish three things: to elicit relevant knowledge from students, to respond to things that students say and to describe the classroom experiences that they share with students. Teachers must be good in communication in order for him/she to be effective in teaching. Teacher with poor communication skills may cause academic failure of students (Feras, 2015). Loss (2000), recommended that teachers should communicate in clear and understandable manner.

Other teachers' skills that affect students' performance is teacher commitment. Mustafa, 2017 describes teacher commitment as internal force that derives teachers to invest more time and energy in keeping up involvement in the school activities. Teacher commitment is associated with creating an effective learning environment in which students enhance their abilities for greater achievement in school work. Teacher's commitments take into consideration; commitment to the school, students, teaching profession and professional knowledge (Tyree, 1996; Yong, 1999). Teacher's commitment to teaching is an important factor which contributes to students' achievement. Moreover, teachers with high level of commitment can make a difference in impacting knowledge to their students. (Mustafa, 2017). Committed teachers are satisfied with teaching and always strive to accomplish good interactions with the students (Somech & Bogler, 2002). Their loyalty to the school is beyond doubt and their desire towards accomplishment of school objectives is obvious (Carbonneau et al., 2008). Teacher commitment is a crucial ingredient that draws attention of teachers to the needs of learners. Also, committed teachers understand how to encourage students to participate actively in the

teaching and learning process. Teachers' motivation is another variable in this study. Remez (2001) defined motivation as the inner power or energy that pushes someone towards an action in achieving a particular goal. In this regard, motivation arouses and pushes one forward, toward taking action and making vision to materialize. Teacher motivation describes those passions that make teachers to do things (Bennell, Bulwani & Musikanga, 2003). If teachers are not well motivated, the performance of the students would be hampered (McKenna, 2000). Therefore, the researchers examined teachers' skills as predictors of students' academic achievement in Mathematics in Ogun State, Nigeria.

2 Hypotheses

- (i) Teachers' skills of commitment, motivation and communication when taking together, will not significantly predict students achievement in mathematics.
- (ii) Teachers' skills of communication alone will not significantly predict students' achievement in mathematics.
- (iii) Teachers' skills of commitment alone will not significantly predict students' achievement in mathematics.
- (iv) Teachers' Skills of motivation alone will not significantly predict students' achievement in mathematics.

Methodology

3.1 Population

The population for this study was made up of all the Senior Secondary School Two (SSS2) students and teachers of Mathematics in Ogun-Central senatorial district of Ogun-State, Nigeria.

3.2 Sample and sampling Technique

The study adopted survey research design. The sample consisted of four hundred and twenty (420) respondents consisting of seventy (70) teachers and three hundred and fifty (350) students randomly selected from seven public secondary schools in four local government areas in Ogun-Central senatorial district in Ogun-State. Purposive Sampling Technique was used to select the seven (7) schools. Fifty (50) students and ten (10) teachers were randomly selected from each school.

3.3 Instrumentation

Two instruments for data collections were:

- (i) Teachers' skills of Commitment, Motivation and Communication Questionnaire (TSCMCQ)
- (ii) Mathematics Achievement Test (MAT)

Teachers' skills of Commitment, Motivation and Communication Questionnaire (TSCMCQ)

The researchers made use of reviewed literature to construct TSCMCQ. The self-constructed questionnaire was used to collect data from mathematics teachers in order to measure some of their teaching skills. The questionnaire had three sections, namely: teachers' commitment, teachers' motivation and teachers' communication skills. TSCMCQ was anchored on a continuum of strongly agreed (SA), agree (A), Disagreed (D) and strongly disagree (SD). The constructed test items were keenly scrutinized for its appropriateness and correctness. The

researcher initially prepared sixty (60) items question which was administered on forty (40) teachers outside the sample selected as a pilot test. The reliability coefficient for each item of the questionnaire addressing different variables was computed based on the responses of the teachers. The cut-off value for the reliability coefficient for each item was set at 0.60. Items that had reliability coefficients lower than 0.60 were deleted while those items with reliability coefficients of 0.60 and above were retained. Thirty five (35) items survived the item analysis procedure constituted for the Teachers' skills of Commitment, Motivation and Communication Questionnaire (TSCMCQ) with eight (8) items on Teachers' skills of commitment, twelve (12) items on teachers' skills of motivation and fifteen (15) items on teachers' skills of communication respectively. The reliability of the instrument was then determined using Cronbach alpha and a reliability coefficient of 0.68 was computed.

Mathematics Achievement Test (MAT)

Mathematics Achievement test is a 60 questions that was designed by the researchers to measure students' achievement in mathematics. The items were taking from Senior Secondary Certificate Examination (SSCE) past questions. The MAT is multiple choice items have four options lettered A-D. The tests items were constructed in such a way to reflect the three categories of cognitive tasks of knowledge, comprehension and application. A reliability coefficient of 0.74 was obtained for MAT using the Split halves method. Inferential statistics of Multiple Regression Analysis (MRA) was used to test the stated hypotheses.

4 Result and discussion

Hypothesis one: Teachers' skills of commitment, motivation and communication when taking together, will not significantly predict students achievement in mathematics.

Table 1: summary of the regression of Teachers' skills of commitment, motivation and communication.

MODEL SUMMARY

Model	R	R-Square	Adjusted R Square	Std. Error of the Estimate
Teachers' skills of commitment, motivation and communication	0.241	0.058	0.051	1.996

ANALYSIS OF ANOVA

Model	Sum of square	Df	Mean Square	F	Sig
Regression	101.958	3	33.898	8.528	0.000
Residual	1657.890	416	3.985		
Total	1759.848	419			

* Significant at the 0.05 level

The result in table 1 reveals that the three predictor variables, when combined, significantly predict students' performance in Mathematic ($R=0.241$, $F=8.528$, $p<0.05$) The table further revealed that the R square value of 0.058, adjusted R square of 0.051 were obtained as multiple regression coefficients. This implies that the independent variables (Teachers' skills of commitment, motivation and communication) are jointly accounted for 5.8 % ($R\text{ square}=0.058$). Since $0.00 < 0.05$, the null hypothesis which stated that teachers' skills of commitment,

motivation and communication when taken together, will not significantly predict students' achievement in mathematics is rejected. Therefore, the teachers' skills of commitment, motivation and communication when taken together, will significantly predict students' achievement in mathematics. This result may not be unconnected with the fact that teachers' skills are reflections of students' performance. This finding is in consonance with the study of Charanjit (2014) that asserted that the learning outcomes of students in school are a function of teachers' skills. Moreover, the skills exhibited by the teacher are the major factor that determines teachers' effectiveness in classroom that may also affect student achievement as pointed out by Paul & Lazarus (2012).

Hypothesis 2: Teachers' Skills of communication alone will not significantly predict students' achievement in mathematics.

Table 2: summary of the Regression of Teachers' skills of communication
MODEL SUMMARY

Model	R	R-Square	Adjusted R Square	Std. Error of the Estimate
Teachers' skills of Communication	0.190	0.036	0.034	2.015

ANALYSIS OF ANOVA

Model	Sum of square	Df	Mean Square	F	Sig
Regression	63.529	1	63.257	15.585	0.000
Residual	1696.591	418	4.059		
Total	1759.484	419			

* Significant at the 0.05 level

Table 2 shows the result of summary of the Regression of Teachers' skills of communication. Data in table 2 reveals R, R-square and F values of 0.190, 0.034 and 15.585 respectively. Also, the table revealed significant effects of teachers' communication skills on students' achievement. Therefore, the hypothesis that stated that teachers' skill of communication alone will not significantly predict students' achievement in mathematics is rejected. Hence, teacher's communication skills motivate students toward learning. This finding corroborates the finding of Feras (2015) that teachers need communication skills to motivate and teach in accordance with the ability and capability of the students toward their learning process. Moreover, good communication skill of teacher will help the students to understand what is expected of them and help build their confidence in learning. The present research study is also supported by Loss, J. (2000) as concluded that good communication skills strengthen the relationship among the students and teachers by improving the level of understanding among teacher and students.

Hypothesis Three: Teachers' skills of commitment alone will not significantly predict students' achievement in mathematics.

Table 3: summary of the Regression of Teachers' commitment

MODEL SUMMARY

Model	R	R-Square	Adjusted R Square	Std. Error of the Estimate
Teachers' commitment	0.208	0.043	0.041	2.007

ANALYSIS OF ANOVA

Model	Sum of square	Df	Mean Square	F	Sig
Regression	75.997	1	75.997	18.865	0.000
Residual	1683.851	418	4.028		
Total	1759.848	419			

* Significant at the 0.05 level

Table 3 shows the result of summary of the Regression of Teachers' commitment. Data in table 2 reveals R, R-square and F values of 0.208, 0.043 and 18.865 respectively. Also, the table revealed significant effects of teachers' level of commitment on students' achievement. Therefore, the hypothesis that stated that teachers' skill of commitment alone will not significantly predict students' achievement in mathematics is rejected. This result may be in connection with the fact that the passion is associated with commitment. Teacher's commitment is a significant factor as it inspires and motivates students. This result is in agreement with the findings of Abyot (2017) that the successes teachers depend on their effectiveness in terms of their commitment to teaching which enhances student's academic achievement. In the same vein, teachers' commitment enhances teaching and learning of mathematics (Paul, K; Elizabeth, R & Lazarus, M., 2012).

Hypothesis four: Teachers' skills of motivation alone will not significantly predict students' achievement in mathematics.

Table 4: summary of the Regression of teachers' motivation

MODEL SUMMARY

Model	R	R-Square	Adjusted R Square	Std. Error of the Estimate
Teachers' motivation alone	0.174	0.030	0.028	2.020

ANALYSIS OF ANOVA

Model	Sum of square	Df	Mean Square	F	Sig
Regression	53.430	1	53.430	13.088	0.000
Residual	1706.417	418	4.082		
Total	1759.848	419			

* Significant at the 0.05 level

Table 4 shows the result of summary of the Regression of Teachers' motivation. Data in table 4 reveals R, R-square and F values of 0.174, 0.030 and 13.088 respectively. Also, the table revealed significant effects of teachers' motivation on students' achievement. Therefore, the hypothesis that stated that teachers' motivation alone will not significantly predict students' achievement in mathematics is rejected. This implies that teacher' motivational factors such as working condition, financial compensation, work promotion, community's perception towards teaching professional and recognition are all important factors that determine students' performance. This result support a study carried out by Shafiwu & Salakpi (2013) that revealed teachers' motivation as a factor that affects student achievement. Also, Ofoegbu (2004) examined teacher's motivation in Nigeria and his findings confirmed that teacher motivation would enhance classroom effectiveness and improve students' academic performance.

5 Conclusions and Recommendations

This study examined teachers' skills as predictors of students' academic achievement in Mathematics in Ogun State, Nigeria. The result of the study showed that teachers' skills of commitment, motivation and communication when taking together, will significantly predict students achievement in mathematics. Also, the finding revealed that teachers' communication skills alone will significantly predict students' achievement in mathematics. Furthermore, the result of the study showed that teachers' commitment alone will significantly predict students' achievement in mathematics. In the same vein, the result of the findings revealed that teachers' motivation alone will significantly predict students' achievement in mathematics. It was recommended, that teachers should be motivated to participate actively in in-service training programs and workshops to update their knowledge and pedagogical skills. Also, the teachers should be flexible when communicating with the students in and outside the classroom. The researchers recommended for further studies the challenges faced by the teachers in implementing their pedagogical skills.

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