

Teachers' Preparation as Determinants of Students' Performance in Mathematics

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Received: February 02, 2020

Accepted: March 06, 2020

ABSTRACT: *This study examined teachers' preparation as determinants of students' performance in Mathematics. The study employed a descriptive research of survey type and quasi-experimental of pre-test, post-test control group design. The population comprises of all Junior Secondary School 2 students and their Mathematics teachers in Ekiti- State. The sample for the study consisted of 48 Mathematics teachers and 120 Junior Secondary School 2 students selected from all the 16 Local Government Areas of Ekiti- State using multistage and purposive sampling techniques. The instruments used for the study were Mathematics Teacher Questionnaire (MTQ) and Mathematics Student Performance Test (MSPT). The Hypotheses generated were tested using Analysis of Variance (ANOVA) at 0.05 level of significance. The findings revealed that teachers' experience had significant influence on students' performance in mathematics. The study also revealed that teachers' qualifications had significant influence on students' performance in Mathematics. Based on the findings of the study, it was recommended that governments and stakeholders in education should encourage experienced teachers to teach at the junior level of schools so as to lay good foundations for the students. Schools should also be staffed with highly qualified Mathematics teachers that can handle the job effectively.*

Key Words: *Teachers' preparation, determinants and students' performance*

Introduction

Mathematics is seen and perceived as one of the abstract subjects that is difficult for students to comprehend. It is an essential nutrient for thought and logical reasoning. The misconception of abstraction of Mathematics has been given as part of the reasons for students' poor performance in the subject. Despite this abstraction, the importance of Mathematics for potential careers cannot be overemphasized. There seems to be problems associated with students' low performance in Mathematics, and some of these problems are teacher-related characteristics. For instance, Popoola (2014) in a study on improving Mathematics teaching in Nigerian schools identified the teachers' problem as one of the prominent problems of Mathematics failure in schools. Arguing further, Ibebuike (2006) noted that many students, even as far back as their primary school days did not have interest in Mathematics to a meaningful degree; remarking that the methods of instruction were not very favorable and less students' friendly which is one of the teachers' characteristics. He posited that this was due to the paucity of competent and adequately qualified Mathematics teachers who were invariably over labored.

There are numbers of teacher related variables that impact students' learning of Mathematics. For instance, Carroll and Foster (2010) focused on the relationship between the number of years of teaching experience and students' achievement. The researchers stressed that the overall level of experience in the teaching workforce is on the decline. The study further emphasized that the overall effects on students' achievement depend on the number of years of experience and the age taught. Goe (2007) opined that teachers' experience contributes to students' learning in their first few years in the classroom, but additional experience of teachers does not make a difference after that. The study of Ilugbusi, Falola, and Daramola (2007) showed that teaching experience in schools count significantly in the determination of students' achievement in external examinations such as West Africa Senior School Certificate Examination (SSCE), National Examination Council (NECO), National Business and Technical Education Examinations (NABTEB) and the Unified tertiary Matriculation Examination (UME). According to them, inexperienced teachers are easily upset and destabilized by unfamiliar situations.

Unfortunately, inexperienced teachers could get confused, mixed up the content of the topics taught to the students, hence, the students will receive wrong information which would definitely lead to poor achievement among the students, while the experienced teachers are already immune to classroom provocative situations and have developed resistance and several solutions against classroom confusion inducing agents. However, Rice (2003) in his research findings observed that the impact of teachers' experience on students' achievement may continue beyond the earliest years in the classroom for teachers at the high school level.

Research has indicated that, teachers with higher qualifications produced the best students in schools. For example, in a study on the relationship between teachers' qualifications and achievement of students, Rockoff (2004) opined that a teacher's advanced degrees in Mathematics and Science are positively related to students' achievement in those subjects in high school, but evidence does not apply more broadly to other academic subjects or grade levels. Darling-Hammond, (2006) continued to explain the important aspects of these relationships, including the specific ways in which teachers' qualification operates and the degree to which it affects learning.

However, it appears that teachers with higher degrees produced better students in schools in that they would be able to share the knowledge of their subject matter and the learning process through good communication skills and techniques to meet their students' needs. Hence, for teachers to perform their professional roles, they must be sound in their subject areas and know what they are teaching. For students to be proficient in Mathematics concepts, Popoola (2013) emphasized that teaching must be handled by teachers who have good experience and knowledge of the subject matters.

Statement of the Problem

The performance level of students in Mathematics has remained low in both internal and external examinations. It seems that the low level of performance in Mathematics has led to low enrolments of students in Mathematics, Science and Technology related courses at the higher institutions of learning. The factors responsible for these poor levels of performance might be attributed to teachers' preparation to the teaching of mathematics such as experience and qualifications among others. To this effect, there is a need to examine teachers' preparation as determinants of students' performance in Mathematics.

Purpose of the Study

The purpose of this study was to examine the teachers' preparation such as teachers' experience and qualification on Junior Secondary students' performance in Mathematics in Ekiti State.

Research Hypotheses

The following research hypotheses were generated for this study:

- (1) Teachers' experience will not significantly influence students' performance in Mathematics.
- (2) Teachers' qualification will not significantly influence students' performance in Mathematics.

Significance of the Study

The findings of the study would be of great assistance to Mathematics teachers, students, parents, government and stakeholders in education. The findings of the study would also enable the government and stakeholders in education to focus on the achievement of the objectives of teaching Mathematics in secondary schools.

Methodology

This study employed descriptive research of survey type. The population for the study comprises of Junior Secondary School 2 students and their Mathematics teachers in Ekiti State. A sample of 48 Mathematics teachers and 120 Junior Secondary School 2 students were selected from all the 16 Local Government Areas of Ekiti- State using multistage and purposive sampling techniques. The instruments used for the study were Mathematics Teacher Questionnaire (MTQ) and Mathematics Student Performance Test (MSPT). For the purpose of this study, only questions pertaining to teachers' experience and teachers' qualification were used and Mathematics Student Performance Test (MSPT) was based on the selected contents. Face and content validity of the instruments were ensured by given it to experts in the field of Mathematics education and Tests Evaluators. Their comments were adhered to and used for data collection. The reliability of the Mathematics Teacher Questionnaire (MTQ) and Mathematics Student Performance Test (MSPT) was ascertained using split half method and test-retest method. Reliability coefficients of 0.79 and 0.81 were obtained. The data collected was subjected to descriptive analysis and inferential statistics such as mean, standard deviation and Analysis of variance (ANOVA) at 0.05 level of significance.

Results

Descriptive Analysis

Descriptive analysis was used to provide answers to the general questions on which this study is based.

Question 1:

a) What are the responses of teachers' according to qualifications and experience.

Table 1: Percentage of Teachers’ Qualification and Experience.

VARIABLES		FREQUENCY	PERCENTAGE
Teacher’s Qualification	NCE	16	33
	B. Sc/B. Ed	15	31
	M. Sc./M. Ed	17	36
Teacher’s Experience	1-5	22	46
	6-10	6	13
	11-15	4	8
	16-20	5	10
	20 above	11	23

Table 1 indicated that 33 percent of the teachers had NCE certificate in Mathematics, 31 percent had B. Sc/B. Ed in Mathematics while 36 percent had M. Sc./M. Ed in Mathematics. Further analysis of the result showed that 46 percent of the teachers had been teaching between 1 to 5 years, 13 percent between 6 to 10 years, 8 percent between 11 to 15 years, 10 percent between 16 to 20 years and 23 percent had teaching experience between 20 years and above.

Hypothesis 1

There is no significant influence of teachers’ experience on students’ performance in Mathematics.

Table 2: ANOVA of the Teachers’ Experience on Students’ Performance in Mathematics

Source	SS	Df	MS	Fc	Ft
Between Groups	2132.559	2	1066.28	9.819	3.15
Within Groups	4886.753	45	108.59		
Total	7019.312	47			

P > 0.05

Table 2 showed that F-cal (9.819) was greater than F-tab (3.15) at 0.05 level of significance. The null hypothesis was rejected. This implies that teachers’ experience significantly influence students’ performance in Mathematics

Hypothesis 2

Teachers’ qualification will not significantly influence students’ performance in Mathematics.

Table 3: ANOVA on the Teachers’ Qualification on Students’ Performance in Mathematics

Source	SS	Df	MS	Fc	Ft
Between Groups	3340.285	4	835.07	9.760	3.15
Within Groups	3679.027	43	85.559		
Total	7019.312	47			

P > 0.05

Table 3 showed that F-cal (9.760) was greater than F-tab (3.15) at 0.05 level of significance. The null hypothesis was rejected. This implies that teachers’ qualifications had significant influence on students’ performance in Mathematics.

Discussion

The result revealed that teachers’ experience has a significant influence on students’ performance in Mathematics. The finding was in line with findings of Ilugbusi, Falola, and Daramola (2007) whose study showed that teaching experience in schools count significantly in the determination of students’ achievement in external examinations. The result also contradicted the findings Feng (2010) whose study showed an insignificant effect of teachers’ experience on students’ achievement. The result also showed that teachers’ qualifications significantly influence students’ performance in Mathematics. The result was in line with findings of Goe (2007); Rice (2003) and Rowan, Correnti, and Miller (2002) whose studies revealed a positive connection between teacher certification in Mathematics and students’ achievement. The result of the study also contradicted the findings of Hanushek (2009) whose study found no positive correlation between the educational performance of the students and the teacher’s educational background. The study concluded that higher teachers’ qualification does not make better students. The finding of the study also contradicted the findings of Popoola (2013) on teachers’ level of understanding of the language of

Mathematics as a determinant of students' achievement in Mathematics whose study showed that qualification is not a significant factor in the teachers' understanding of Mathematical terms.

Conclusion and Recommendations

Based on the outcome of this study, it can be concluded that teachers' preparation had a significant influence on students' performance in Mathematics. The study recommended that governments should encourage experienced teachers by paying salaries when due and giving them their promotions at the appropriate time and schools should also be staffed with highly qualified Mathematics teachers so as to be able to handle the job effectively.

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