

THE INFLUENCE OF MATHEMATICS TEACHERS' MASTERY OF THE SUBJECT ON THE PERFORMANCE OF SENIOR SECONDARY SCHOOL STUDENTS

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Abstract

The performance of senior secondary school pupils in Akinyele LGA, Ibadan, Oyo State was examined in this study to determine the impact of mathematics instructors' subject knowledge. The study's research design was an analytical descriptive survey. Three hundred (300) pupils from six secondary schools in the Akinyele LGA of Oyo State were selected at random to make up the sample. From each school, fifty (50) pupils were chosen. The researchers' instrument for gathering data was the Mathematics Achievement Test (MAT). The thirty (30) multiple-choice questions in the MAT are used to assess the hypotheses. Using the one-way Analysis of Variance, two primary hypotheses were developed and assessed for significance at the 5% level (ANOVA). The study's findings showed a strong correlation between teachers' qualifications and pupils' academic achievement in mathematics. The results also indicated a strong correlation between math students' academic achievement and teachers' experience. Therefore, the study recommended that teachers be exposed to local and worldwide seminars and workshops in order to improve and expand their mathematical expertise.

Keywords: *Academic performance, Experience, Mastery, Qualification.*

Introduction

Since the beginning of time, mathematics has been a crucial topic because of its usage in daily life and its value to other sciences. A body of knowledge called mathematics is centered on ideas like quantity, structure, space, change, and the academic field that investigates them. According to Odili (2006), Mathematics is a creation of the human mind and can be viewed as a body of knowledge, a collection of strategies and procedures, the end result of human effort, or even the activity itself. It is clear from Odili's statement that mathematics is both a product and a process. Mathematics is a process that focuses on problem-solving activities; nevertheless, as a product, it involves strategies and procedures that produce distinctive results.

Odili's explanations suggest that mathematics is crucial to humankind. Mathematics was simply described by Ugwuanyi (2009) as a science of order and numbers. Aguele and Usman (2007) argued that a strong foundation in mathematics is what Nigeria needs to overcome the problems of the twenty-first century and propel science and technology to the fore of national development. The country faces high impact of challenges and focus. In

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terms of mathematics, these issues include a lack of math teachers, a lack of access to current math teaching resources, and low student willingness to study arithmetic. Having total knowledge of something is what Okafor (2010) defines as mastery. Therefore, having a thorough understanding of mathematical concepts, ways to transmit such concepts, and useful evaluation techniques for students' performance are necessary for mastering mathematics. In terms of mastery, Odili (2006) cautioned that before they can successfully teach Mathematics, teachers must have a solid understanding of the subject. Odili added that the scenario should be such that a teacher teaching quadratic equations is already familiar with trinomial equations or one teaching number and numeration has already taken some number theory courses. A teacher in mathematics will be forced to solve one example due to a lack of material understanding (probably, the one in the textbooks). The mathematical potential of the children will be ruined under such a teacher. When students bombard a teacher with mathematical questions, the teacher benefits from his grasp of the subject matter. According to Bruner's theory of instruction, students learn by reconstructing new concepts about previously held knowledge, which is used to demonstrate the requirement for learning activities in which the mathematics teachers are experts in the subject matter they are teaching. Teachers that have a solid grasp of the mathematics curriculum will be able to introduce the basics of the subject to the students.

Through the reconstruction of knowledge, this will help the pupils gain a comprehensive comprehension of mathematical ideas. According to their training and teaching experience, the percentage of teachers who are proficient in these subjects was evaluated, and their average proficiency was compared. Another element that tremendously affects instructors' performances is their teaching experience, which is the sum of all the knowledge and abilities they have acquired while practicing their job. Experience, according to Hornby (2006), is the knowledge and expertise someone has acquired via doing something for a period. It is still unclear whether teaching experience affects math achievement. In favor of experienced teachers, Okafor (2010) found a statistically significant difference in the mean mastery scores between experienced and less experienced teachers. Therefore, it is necessary to evaluate whether teaching experience affects secondary school mathematics instructors' understanding of the mathematics curriculum.

In addition to prior teaching experience, teachers' credentials also have an impact on students' academic performance. Less disagreement has been found in the evidence from earlier research suggesting teachers' qualifications affect pupils' math performance. For instance, Aliyu, U.A., Ahmad, Y., and Awogbemi, C.A. (2013) observed that pupils do better in mathematics when they are taught by a teacher who holds a bachelor's or master's degree in the subject. Similar to this, Abe (2014) asserted that hiring qualified instructors in all schools is the most crucial aspect in boosting kids' performance in mathematics. Therefore, Abe provided a thorough description of a qualified teacher as follows: academically qualified instructors are those who have academic training as a result of enrolling in a school and earning degrees like NCE, HND, B.Sc., or B.A. & M.A, B.Ed. so forth. Professionally qualified teachers, on the other hand, develop information, abilities, strategies, and skills that are distinct from those found in general education.

Statement of the Problem

Parents, researchers, curriculum developers, instructors, and the government have all grown concerned with pupils' math proficiency over time.

Most math teachers in senior secondary schools received their education in a university.

For the sole purpose of boosting teachers' proficiency, all levels of government as well as educational institutions hold seminars and workshops for instructors.

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Teachers of mathematics are expected to possess good qualifications and show that they are proficient in a range of curriculum subjects.

But despite initiatives to retrain and retrain math teachers, math pupils' dismal performance has continued. One of the contributing factors to pupils' underachievement in mathematics may be the teachers' degree of expertise in the subject.

Consequently, the goal of the study is to ascertain how well-versed in the topic Mathematics instructors are and how this influences their students' performance in senior secondary school.

Research Objectives

This study's particular goals are to:

1. Analyze how students' academic performance is influenced by the qualifications of mathematics teachers.
2. Determine how teaching experience in mathematics has an impact on the academic performance of the pupils.

Research Hypotheses

The null hypotheses below were suggested to direct this effort based on the aforementioned research goals:

H₀₁: There is no significant relationship between students' academic performance and teachers' qualification.

H₀₂: There is no significant relationship between students' academic performance and teachers' experience.

Methodology

Research Design

As a method of inquiry, this study used an analytical descriptive survey. Using surveys to gather information on people's opinions, sentiments, attitudes, and perceptions of issues has been demonstrated to be a very effective strategy.

Scope of the Study

The research analysis was conducted using state secondary schools in Akinyele L.G.A., Moniya in Akinyele Local Government Area in Ibadan, Oyo state.

Population of the Study

This research paper study's the population of all Senior Secondary School (SSS) students in Oyo State, Nigeria. The private and Public schools were used in this study just to test very knowledge of students and teachers.

Sample and Sampling Technique

The collected sample comprises of 300 senior secondary school students which was selected at random from 6 senior secondary schools in Akinyele Local Government Area LGA of Oyo State. Fifty (50) respondents were selected in each of the six (6) secondary schools selected for this work.

Research Instrument

The Mathematics Achievement Test (MAT), which was created by the researchers, was the instrument used in this investigation. Two sections made up the Mathematics Achievement Test (MAT): Section B comprised of Thirty (30) multiple choice questions while section A was about personal information about the respondents. The instrument was to evaluate students' understanding of several mathematical concepts, including algebra, trigonometry, geometry, statistics, probability, and their accompanying behavioral goals.

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Validity and Reliability of the Instrument

The test was put through content and facial evaluation. After reviewing MAT, specialists in test and measurement suggested that the full instrument be used for this investigation. The Kuder-Richardson (KR-21) formula was used to measure the reliability of MAT, and the internal uniformity index was estimated to be 0.93.

Method of Data Analysis

Inferential statistics were used to assess the research's data collection. Each hypothesis was examined using a one-way ANOVA.

Results

Research Hypothesis H₀₁ :There is no significant relationship between teachers’ qualifications and students’ academic performance.

Table 1: Analysis of Variance (ANOVA) of teachers’ qualifications on students’ academic performance in Mathematics Achievement Test Instrument (MAT)

Variation Source	Sum Squares	of Df	Mean Square	F	Significant	Decision at 0.05 level
Between Groups	48.449	2	24.225	38.331	.000 ^b	Significant
Within Groups	187.691	297	0.632			
Total	236.140	299				

The results in table 1 indicated that the level of significance of teachers’ qualification on students’ academic performance, the ANOVA shows that its significant $F = 38.331, p < .05$. Thus, the null hypothesis H₀₁ of no significant relationship between teachers’ qualifications and students’ academic performance was rejected at 0.05 level of significance.

Research Hypothesis H₀₂ :There is no significant relationship between teachers’ experience and students’ academic performance.

Table 2: Analysis of Variance (ANOVA) of teachers’ experience on students’ academic performance in Mathematics Achievement Test Instrument (MAT)

Variation Source	Sum Squares	of Df	Mean Square	F	Significant	Decision at 0.05 level
Between Groups	45.128	2	22.564	105.439	.000 ^b	Significant
Within Groups	63.570	297	0.214			
Total	109.698	299				

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The results in table 2 revealed that teachers' experience on students' academic performance is significant $F = 105.439$, $p < 0.05$. Thus, the null hypothesis H_{02} of no significant relationship between teachers' experience and students' academic performance was rejected at 0.05 level of significance.

Discussion of Findings

The study which was by the theme the influence of Mathematics teachers' mastery of the subject on the performance of senior secondary school students in Akinyele LGA. After careful analysis of the field report in the research question, respondent observed that; teachers' qualification and experience have tangible effects on teachers' mastery. The findings agreed with that of Rockoff (2004) who stated that teachers' qualification has a strong and statistically significant difference with student achievement. From the general analysis done in this section, it can be observed that all the tested alternative hypotheses were accepted. Through the use of ANOVA, it was discovered that teachers' mastery of the subject has substantial influence on performance of secondary school students in mathematics.

The results of hypothesis one showed a substantial correlation between students performance and teachers' qualifications. The result findings above significantly support Abe (2014) observation that students taught by teachers with B.Sc. and students taught by teachers with NCE performed significantly differently. The advanced knowledge of mathematics that teachers with higher qualifications have acquired during their training may be the cause of the significant mastery score in their favor. The results of hypothesis two showed a strong correlation between teachers' experience and pupils' academic achievement. This result is consistent with Okafor (2010) argument who reported that the knowledge of number base in primary school was influenced by years of teaching experience. Because they already knew mathematics, experienced teachers may have performed far better than their less experienced counterparts.

Furthermore, the significant mastery found among the experienced teachers may be attributable to the information they have learned through personal studies, workshops, and other forms of refresher training.

Conclusion

The effectiveness of mathematics teachers in the senior secondary school population of the Akinyele LGA is investigated in this study. The study's conclusions showed that the independent variables—teacher mastery, which is determined by a teacher's training and experience had a significant impact on students' mathematical proficiency. Therefore, teachers' mastery has influence on students' academic performance. In the same vein, teachers' academic qualification and experience made significant contribution to teachers' mastery of the subject and students' achievement in mathematics.

Recommendations

With regard to the findings of this study, the researcher made the following Recommendations:

1. It is important for Teachers to attend international and local conferences including workshops for upgrading and enhancement of mathematics knowledge.
2. Programs for teacher preparation should receive a lot of attention, particularly in the areas of course content, the number of applicants, and the outcome of qualified educators.
3. To ensure that teachers perform their duties effectively and in accordance with the standards for the teaching profession, teachers should be routinely supervised and monitored on the general aspect of teaching and learning.

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4. In order for veterans and experienced Teachers who are still ready to serve to contribute their wealth of knowledge to improve the system performance, the government should find every way feasible to keep them functioning.

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