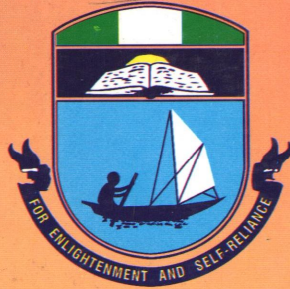


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RELATIONSHIP BETWEEN LEARNERS' BELIEF AND ACADEMIC ACHIEVEMENTS
IN MATHEMATICS AMONG SENIOR SECONDARY SCHOOL STUDENTS IN ILORIN
SOUTH LOCAL GOVERNMENT AREA OF KWARA STATE

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Abstract

This study adopted a descriptive survey design, using one hundred and twenty (120) students sampled from four purposively selected public co-educational schools in Ilorin South Local Government Area of Kwara State. The study therefore investigated the relationship between the beliefs of students and their achievement in Mathematics. In line with the research questions raised and the hypotheses tested, a well structured questionnaire which was validated by experts served as the main instrument for data collection. It was found out that there was a significant relationship between the beliefs of students and their achievement in mathematics. Also, there was a significant difference in the achievement of students with positive and negative beliefs towards mathematics. This was in favour of students with positive beliefs towards Mathematics. Similarly, there was a significant difference in the academic achievement of male and female students on the basis of their beliefs, this was in favour of the male students. Consequently, it was recommended that teachers should develop positive relationship with students, stress classroom activities which involve active teaching-learning process and encourage students' participation.

Key Words: Mathematics, Students, Beliefs, Relationship, Achievement

Introduction

Beliefs are psychologically held understandings, premises, or propositions about the world that are thought to be true. Beliefs are more cognitive, felt less intensely, and are harder to change than attitudes. Beliefs might be thought of as lenses that affect one's view of some aspects of the world or as dispositions towards action. Beliefs may be held with varying degrees of conviction and are not consensual. Beliefs are more cognitive than emotions and attitudes (Wikipedia, 2007).

In education, available research suggests that students' beliefs toward a subject lead to academic success (Hill, 2001). For many students studying mathematics in school, the beliefs or feelings that the students have in mind about the subject are at least as important as the knowledge they learn of the subject. In the same vein, students' beliefs about mathematics and mathematics achievement can have a substantial impact on their interest in mathematics, their enjoyment of mathematics, and their motivation in mathematics classes. Olagunju (1998) opined that there are mystifying beliefs among students about the exceptional difficulties associated with the learning of mathematics.

Furthermore, students' beliefs and achievement hold some implications with respect to their final choice of career in life. Hence the importance accorded mathematics in the school curriculum considering its indispensable role in the contemporary society, particularly in line with the broad aims of secondary education as captured in the National Policy on Education (FRN, 2004) objectives aimed at preparation for useful living within the society and the preparation for higher education.

In the match towards scientific and technological advancement, nothing short of good achievement in mathematics at all levels of schooling is required (Akanmu & Fajemidagba, 2013). This is partly due to its important contribution to day-to-day activities in modern society and its contribution to the realization of national goals and development. Mathematics provides opportunity to inculcate permanent literacy and numeracy in an individual as well as laying a solid foundation for scientific and reflective thinking which are vital goals in modern technology.

The Problem

In spite of the importance accorded mathematics, it has been observed that many academically capable students prematurely restrict their education and career by discontinuing their mathematical learning early in school based on negative beliefs toward mathematics. The poor results in this subject have continued to be stumbling-blocks in the realization of the educational and employment desire of many candidates because it is a gatekeeper for many careers. The failures were mostly caused by some factors among which are students' beliefs and attitudes (Akinsola, 2002).

Objectives

Considering the envisaged technological advancement and the implications of continued erroneous beliefs of students toward mathematics, the concern of this study was to therefore investigate the influence of students' beliefs on their achievement in mathematics. The study also examined the relationship among students' beliefs, gender and academic achievement in mathematics.

Research Questions

The following questions were raised as guide for the study:

1. Is there any relationship between the beliefs of students about mathematics and their achievement in general mathematics at the Junior Secondary School level?
2. Is there any difference in the academic achievement of male and female students on the basis of their beliefs?

Research Hypotheses

The following null hypotheses were tested in this study:

Ho₁: There is no significant difference in the performance of students with positive and negative beliefs towards mathematics.

Ho₂: There is no significant difference in the mean scores of male and female students in Mathematics on the basis of their beliefs.

Research Methodology

This study employed a descriptive survey method which serves as the major methodological thrust and it assisted in gathering necessary information on the relationship that exists between students' beliefs and their achievement in mathematics. 120 students from four purposively selected Junior Secondary Schools in Ilorin South Local Government Area of Kwara State operating co-educational system participated in the study.

The main instrument used for data collection was a researcher designed questionnaire validated by experts who assessed the correctness of statements and parameters for classification of students' beliefs. The questionnaire which consisted of well structured statements delved on areas bothering on students' beliefs with respect to mathematics as a subject. The data gathering was personally handled by the researcher with the help of four research assistants in the selected schools to ensure accuracy and authenticity of the data. The method used in analyzing the data obtained was mainly of descriptive statistics. It involved the use of frequency counts, percentages and average score. Chi-Square test was also used to test the hypotheses. In all, a total number of 120 respondents made up of 68 male and 52 female participated in the study.

Results

Ho₁: There is no significant difference in the performance of students with positive and negative beliefs towards mathematics.

The distribution of the responses with respect to students' beliefs toward Mathematics is as shown in table 1.

Table 1: Responses on Beliefs of Students and their Achievement

Number of Students	Number of with positive beliefs	%	Number with negative beliefs	%	Mean Score for positive beliefs	Mean Score for negative beliefs
120	83	69.17%	37	30.83%	56.27	38.72

From table 1, 69.17% of the total respondents have positive beliefs towards mathematics with mean score to be 56.27, this implies that students with positive beliefs toward mathematics are greater in number than those with negative beliefs. To further ascertain this, particularly in relation to the academic performance of the students, hypothesis one was tested and the result is presented in table 2.

Table 2: Chi-Square Test on the performance of students with positive and negative beliefs towards mathematics

	Values	Degree of freedom	Assumption of significance
Pearson Chi-Square	14.23	2	0.05
Likely Hood Ratio	14.21	2	0.048

From the analysis of table 2, $X^2_{cal} = 14.23 > X^2_{tab} = 7.34$ at 0.05 level of significance, this shows that there is significant difference in the performance of students with positive and negative beliefs towards mathematics. This was in favour of students with positive beliefs. Hence, the hypothesis was not accepted.

H₀₂: There is no significant difference in the mean score of male and female students in mathematics on the basis of their beliefs.

Table 3: Male and Female Mean Score and their Beliefs

Gender	Beliefs	
	Positive	Negative
Male	58.2	21.3
Female	45.41	28.9

Table 4: Observed and Expected frequency: the mean score of male and female students in mathematics on the basis of their beliefs

O	E	(O - E)	(O - E) ²	$\frac{(O - E)^2}{E}$
58.2	53.6	4.6	21.16	0.39
45.4	50.1	-4.69	22.10	0.44
21.3	25.9	4.6	21.16	0.82
28.9	24.3	4.6	21.16	0.87
				2.52

Table 5:
Summary of the Chi-Square analysis

	Value	Degree of freedom	Assumption of significance
Pearson Chi-Square	2.52	1	0.05
Likely hood ratio	2.50	1	0.048

From the analysis of the results in table 5, $X^2_{cal} = 2.52 > X^2_{tab} = 2.35$ at 0.05 level of significance, this shows that there was significant difference in the mean scores of male and female students in mathematics on the basis of their beliefs. The alternative hypothesis that there is significant difference in the mean score of male and female students in mathematics on the basis of their beliefs was therefore accepted. This was in favour of the male students.

Summary of Findings

The major findings of this study revealed that beliefs effectively predicted the achievement of students in mathematics. Based on the results, the following conclusions were made:

- There is relationship between the beliefs of students and their achievement in mathematics;
- There is significant difference in the academic achievement of male and female students on the basis of their beliefs; and
- There is significant difference in the performance of students with positive and negative beliefs towards mathematics.

Conclusion

Emanating from the findings of this study, it can be deduced that there existed a significant relationship between learners' beliefs towards a subject and their performance particularly as it affects Mathematics. The task is to therefore ensure that students are made to be aware of the importance of mathematics with how to developing positive beliefs towards the subject using packages that are both qualitative and quantitative enough to suit into diverse learning needs and generate interest of the learners.

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