Influence of Achievement Motivation and Study Habits on Students Academic Achievement in Mathematics

Awai Daniel

Department of Educational Psychology, Guidance and Counseling Faculty of Education

ABSTRACT This study investigated influence of achievement motivation and study habits on students' academic achievement in mathematics. The study was a correlational research. Samples of 1020 senior secondary two (2) students were drawn through multi-stage sampling technique. The instruments used for the data collection was a questionnaire tagged achievement motivation and study habit of students and Matimatics Academic achievement test (MAAT) constructed by the researcher to find out students' achievement. The reliability coefficient score of 0.88 for achievement motivation, 0.83 for study habit were obtained using Pearson Product Moment Correlation Method. Stepwise multiple regression analysis was used for data analysis. The result obtained revealed that achievement motivation and study habit had significant linear prediction on students' academic achievement in Mathematics.

Introduction

Achievement motivation as defined by McClelland (1969) is the positive and negative effects aroused in situations involving competitions or certain standards of excellence where performance in such situations can be assessed as success or failure. Wigfield and Eccles (2000) looked at achievement motivation as a personality trait that distinguishes individuals based on their tendency or aspiration to do things well and compete against a standard of excellence. It reflects an individual's continuing efforts to improve him or herself to progress, seek, pursue and strive to achieve goals either for the inherent joy and satisfaction arising from or for some material benefits, for example, popularity or achievement. Tella (2007) defines achievement motivation as self determination to succeed in whatever activities one engages in, be it academic work, professional work, sporting events, among others. In all, this construct, achievement motivation, can also be referred to as an individual's effort to master a task, achieve excellence, overcome obstacles, perform better than others, and take pride in exercising talents. Operationally defined, achievement motivation is students' personal goals, values, and beliefs with regard to mathematics achievement.

Gesinde (2000) suggests that the urge to achieve varies from one individual to the other, while for some individuals the need for achievement is very high whereas for others it may be very low. However, there are high achievers and low achievers. What is responsible for the variation could be the fact that achievement motivation is believed to be learnt during socialization processes and learning experiences (Tella, 2007). Hence, Gesinde (2000) further asserts that, those who have high achievers as their model in their early life experience would develop high need to achieve, while those who have low achievers as their model hardly develop the need to achieve. Motivation is a multidimensional construct. Students can be extrinsically or intrinsically motivated. Intrinsically motivated students engage in an activity for its own sake, because they find working on the task enjoyable. Deci and Ryan (2007) define intrinsic motivation as life goals that organize and direct behaviour over time. It is the internal reward which occurs while a person is performing an activity in which he takes delight and satisfaction in doing. (For example, solving mathematics problems for the sake of the love and joy one has for mathematics). On the other hand, students can also be

extrinsically motivated to engage in an activity when they believe that working on the task will result in desirable outcomes (e.g. good grade, reward). Extrinsic motivation refers to pursuing a particular goal-directed behaviour (Deci & Ryan 2000). It is incentive or reward that a person can enjoy after he/she finishes his work. According to Deci and Ryan, (2000) intrinsic motivation usually results in more cognitive engagement than extrinsic motivation.

Achievement motivation is influenced by those factors that affect students' perceptions of their relationship to the achievement setting (e.g. the classroom). Several internal and external factors contribute to a students' motivational orientation in the classroom. These include recognizing the relationship between effort and ability, understanding the classroom reward structures, balancing academic mastery and social competence, and choosing tasks of appropriate difficulty. Although, research in this area tends to focus on academic behaviour – such as completing assignments, participating in class, and so forth – these concepts can easily be extrapolated to understand other behaviours that occur in the school setting. Students' conceptions about these factors change over time. In early childhood and primary grades, children focus on self-mastery and competence. More effort to master their environment typically leads to better outcomes. Young children are intrinsically motivated to gain more competence. In later childhood and adolescence, children become more externally oriented, more focused on academic and social competence as compared to others. This shift results in motivational orientations that are complicated by the need to protect one's sense of self-worth and the need to continue to gain academic skills or comply with behavioural expectations. It is in a bid of critically investigating how achievement motivation and study habit influences the academic achievement of students in mathematics that this study was conceived.

Statement of the Problem

The National Policy on Education recommends mathematics as one of the core subjects to be studied at the secondary school level and admission requirement into higher institutions in the country demands a credit level pass in mathematics. But, despite its utilities and importance, mathematics is still been perceived by secondary school students as difficult, boring, abstract, not practicable and believe that achievement in mathematics requires a special

ability. Many students therefore develop negative attitude and hatred towards mathematics which result in mathematics phobia. The students become discouraged to the extent that most students who are considered above average in intellectual ability still find mathematics difficult.

Over the years, performance of secondary school students in both internal and external examinations has been poor. For example, the percentage passes of students who obtained a credit level pass and above (A1-C6) in 2007, showed that, out of 530, 074 candidates, only 36.76% passed, in 2008, out of 1,024,451 candidates only 51.28% passed, and in 2009, out of 1,019,524 candidates, only 43.04% passed. This trend of failure, have continued to increase examination malpractices. For example, in 2009, there were 33.18% cases of examination malpractices in mathematics (source: WAEC office). These results revealed that the extent of poor academic performance of students in mathematics is serious. It is disturbing that for these years many students did not attain up to the 'credit level pass' which is a prerequisite for entry into higher institutions in Nigeria. The situation is even more disturbing when viewed against the nation's aspiration for scientific and technological advancement and must have compelled Osibodu (1988) to describe poor academic performance in mathematics among secondary school students as a major problem in Nigeria educational system that requires urgent and serious solution.

The problem of poor academic achievement will hinder Nigeria's attainment of her educational objectives in the 21st century. Hence, considering the incidence of poor academic achievement in mathematics, the study examined whether psychological parameters can predict academic achievement of secondary school students in mathematics.

Purpose of the Study
In specific terms, the study sought:

1) Whether achievement motivation can predict secondary school students' academic achievement in mathematics.
2) Whether study habits can predict secondary school student's academic achievement in mathematics.

Research Questions
The following research questions guided the study:

1) To what extent does achievement motivation predict secondary school students' academic achievement in mathematics?
2) To what extent does study habit predict secondary school academic achievement in mathematics?

Hypotheses
The following null hypotheses were tested at 0.05 level of significance

1) Achievement motivation does not significantly predict students' academic achievement in mathematics.
2) Study habit does not significantly predict students' academic achievement in mathematics.

Methodology
Research Design
The design of the study was a correlational study which sought to investigate whether any relationship existed between some psychological parameters and academic achievement in mathematics. This design was considered most suitable for this study because it is used in a situation where the researcher wants to predict one variable from another (Nwankwo, 2006).

This design allows the observation of the extent of relationship of the independent variables (psychological parameters) on dependent variable (academic achievement) of secondary school students in mathematics.

Population for the Study
The population for the study comprised all senior secondary school students in Rivers State public schools. The number is made up of both male and female students from both the rural and urban areas.

Sample and Sampling Technique
The study sample was obtained by means of a two-stage probabilistic sampling procedure. In the first stage, 10 secondary schools were selected at random from urban and rural schools so as to ensure even representation.

In the second stage, for each school in the sample, students of senior secondary two students (SS2) were chosen at random.

The sample was selected by simple random sampling with the size being determined using standard sampling formula based on the population size. The resulting sample size was calculated to be approximately 400 students.

The final sample consisted of 1020 senior secondary two students. Senior secondary two students (SS2) were chosen because they are matured enough to read, understand and respond to the items of the research instruments appropriately.

Instrument for Data Collection
Two instruments were used for the study. They include Achievement Motivation Scale which consists of 15 items adopted from Bakare's study habit inventory meant to gather information on the students' study habit. The Mathematics Academic Achievement Test (MAAT) which consists of a 20-item objective questions developed by the researcher based on Government approved Senior Secondary two (SS2) syllabus. It was administered to determine students' level of academic achievement in mathematics.

Validity of the Instrument
Three experts in the area of measurement and evaluation read through the items of the Psychological Assessment Scale (PAS). The face and content validity of the Mathematics Academic Achievement Test (MAAT) were also done by giving copies of the items to three senior secondary school mathematics teachers familiar with the topics to judge the items. Their suggestions and recommendations were incorporated into the final instrument.

Reliability of the Instruments
To ascertain the reliability of the instruments after modifications, they were administered on 50 respondents who were secondary school students (SS2) selected from another five secondary schools which were not part of the study sample using test retest method. Using Pearson Moment Correlation, the following coefficients were obtained, achievement motivation 0.88 and study habit 0.83. All the items in the instruments were really very relevant to the content of the study.

Method of Data Analysis

The data analysis methods used in the analysis of the data collected was multiple regression analysis. This was selected due to the research questions and hypotheses and the size of the sample used. ANOVA and standardized beta values were used for determining the nature of the relationship (positive or negative) between the independent variables of the study achievement motivation and study habits and the dependent variable (academic achievement in mathematics). The t-statistics significance (sig) was used as main analysis model for the test of significance of the relationship between independent and dependent variables.

Results

Table 1: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficient	R		Correlation		
		B	Std error	Beta	t	Sig.	Zero order	Partial	Part
1	Constant	27.107	.934		29.029	.00			
	Ach Mot	1.590	.23	.635	25.977	.00	.635	.635	.635
2	Constant	12.374	1.156		10.704	.00			
	Ach Mot	.514	.020	.553	25.399	.00			
	EI	.381	.021	.390	17.916	.00			
3	Constant	9.674	1.289		7.504	.00			
	Ach Mot	.379	.034	.420	11.578	.00			
	EI	.161	.035	.387	17.962	.00			
				.164	4.553	.00			
4	Constant	8.835	1.324		6.674	.00			
	Ach Mot	.1300	.048	.322	6.236	.00			
	EI	.380	.021	.388	18.061	.00			
	Study habit attitude	.138	.036	.141	3.809	.00			
		.123	.047	.130	2.643	.00			

a. Dependent variable: MAT

Result on table 1 showed that each of the independent variables that entered into the equation made a significant contribution to the prediction of students' academic achievement in mathematics. Specifically, achievement motivation made the most significant contribution (Beta = 0.553, t=25.399, p<0.05) to the prediction of academic achievement in mathematics. This was followed by emotional intelligence (Beta = 0.390, t=17.916, p<0.05); study habit (Beta = .164, t=4553, p<0.05) and lastly, attitude towards mathematics (Beta =0.130, t=2.643, p<0.05). Self-concept did not enter into the equation and therefore was insignificant.

The data on table 1 revealed that the b value of attitude is positive showing that there is a positive relationship between attitude and academic achievement in mathematics. The β = 0.130, t (994), p<0.05 was the least important predictor but statistically significant. However, its practical significance is questionable (just 0.3% contribution to the variance in mathematics achievement). However, the null hypothesis of no significant prediction of students' academic achievement on their attitude towards mathematics is rejected.

The data on table 1, revealed that the beta value of achievement motivation was β = 0.553, t (997) = 25.399, p<0.05. Therefore, the null hypothesis that states that "there is no significant prediction of students' achievement on their achievement motivation" is rejected. That is, the more motivated students are, the higher their achievement in mathematics.

Summary

This study investigated influence of achievement motivation and study habits on student's academic achievement in mathematics. The result of the findings showed that each of the independent variables that entered into the equation made a significant contribution to the prediction of students' academic achievement in mathematics. Specifically, achievement motivation made the most significant contribution (Beta = 0.553, t=25.399, p<0.05) to the prediction of academic achievement in mathematics. This was followed by study habit (Beta = .164, t=4553, p<0.05).

Recommendations

Based on the findings or results of the study, the following recommendations were stated;

1) Teachers should develop positive relationships with students and stress classroom activities, which will improve active teaching – learning process and students' participation in class so that students will benefit maximally from instruction.
2) Classroom environment where students feel they "fit" will increase these psychological parameters. Providing forums where students work in small groups may serve to increase sense of belongingness while at the same time, providing students additional peer support.
3) The need for educational evaluators to improve measurement of the non-cognitive variables among students of mathematics.
4) Government and ministry of education in particular should give urgent attention in the area of teacher education in mathematics by arranging workshops, seminars and refresher courses for practicing mathematics teaches on regular basis. This will help them learn new and current method of teaching mathematics which will improve academic achievement in mathematics.
5) Parents as well as the government should engage in programmes that can promote these psychological parameters to improve students' academic achievement

in mathematics.

6) Teachers' use of derogatory words or language on students during mathematics classes may be counter-productive. Mathematics teachers should use reinforcement techniques or strategies which will help the student in achieving maximally in mathematics.

7) There is a need to foment collaboration between counselling psychologist (school counselors) and mathematics teachers in the affective domain field, given its influence on the quality of school-level learning. This will require the establishment of projects and programs of prevention and intervention in difficulties of mathematics learning and achievement. The aim will be to stimulate the attraction and taste for mathematics and to improve the psychological parameters and the emotional reactions that students experience when they are learning mathematics. This program will surely reduce the academic fear of mathematics bothering on phobia.

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