



# **Achievement Motivation as Predictor of Academic Achievement of Senior Secondary School Student in Mathematics Edo State, Nigeria**

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## **Authors' contributions**

*This work was carried out in collaboration between both authors. Author OSE designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript, managed the analysis of the study while author FTA managed the literature searches. Both authors read and approved the final manuscript.*

## **Article Information**

DOI: 10.9734/JESBS/2019/v32i430179

### Editor(s):

(1) Dr. Shao-I Chiu, Associate Professor, Professional Development in Education, Da-Yeh University, Taiwan.

### Reviewers:

(1) Mohd Abid Siddiqui, Aligarh Muslim University, India.

(2) Marcelo Simões Mendes, University of Sorocaba, Brazil.

(3) Alan Garfield, University of Dubuque, USA.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/52039>

**Original Research Article**

**Received 24 August 2019  
Accepted 27 October 2019  
Published 11 December 2019**

## **ABSTRACT**

The study examined the achievement motivation as predictor of academic achievement among Senior Secondary School II students in Edo State, Nigeria. The sample of the study consisted of 698 students who were randomly sampled from the population of 27,937 students in public secondary school II students in Edo State. The sample size was 2.5% of the entire population, which was drawn, using the multi-stage sampling technique. There are eighteen Local Government Areas in Edo State, divided into three (3) senatorial districts - Edo North (5 local Government Areas); Edo Central (6 Local Government Areas); Edo South (7 Local Government Areas). Both independent and dependent variables were measured with relevant standardized instruments. To guide the study, three (3) research questions were raised and a null hypothesis was formulated. Data collected were analyzed using Pearson r correlation coefficient and Stepwise multiple regression

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statistical techniques. The results showed that achievement motivation predicted students' academic achievement in Mathematic. On the basis of the findings, it was recommended that achievement motivation should be enhanced using appropriate psychometric strategies.

*Keywords: Achievement; motivation; mathematics; prediction.*

## 1. INTRODUCTION

The concept of achievement has several meanings. It could denote activity and mastery that makes an impact on the environment and competing against some standard of excellence. The under achieving student is one whose actual attainment as indicated by his scholastic attainment in school, does not measure up to his potential academic achievement as indicated by his abilities [1]. Marsh has described over achievers as students whose school attainment is in excess of expectations formed on the basis of their activities. The concepts of over and under achievement suggest that there are variables in addition to ability which have positive effects on the performance of the learner and consequently, there could be no perfect positive correlation between intelligence and attainment [2].

Academic achievement itself is the amount of knowledge derived from learning by the learner, as he/she gains knowledge from instructions he or she receives at school. In short academic achievement is important because it promotes success later in life [3]. The instruction is organized around a set of core activities in which a teacher assigns tasks to students and evaluates and compares the quality of their work. The school thus provides a wide variety of achievement experiences than does the family [4] (Tucker, 2008; Zayco, 2002).

According to Adams [5], learners in classes of 22-25 to classes of less than 20 performed much better in standardized test. Also Kelly [6] observed that students work better in smaller groups and easily learn and achieve better from their peers, exchange knowledge and build closer relationships among their peers. However Kisumu and Cate [7] stated that achievement motivation is important in predicting academic performance through good study strategy and high effort. These variables are therefore important to educational researchers and other related disciplines. The focus of this study is on each student's sense of self as a major component of academic achievement. According

to Akomolafe [8], academic achievement is based on several factors, such as the student's attitude, interest, personal characteristics, motivation and social class which in addition to learning are known to influence their academic achievement. Motivation relates to the individual's reason for engaging in an activity, and the persistence of the individual [9]. The attitude that is often used in conjunction with academic achievement is achievement motivation.

Motivation is a widely researched topic in both the fields of psychology and education. Achievement motivation can best be understood by examining the meanings of "achievement" and "motivation" separately. Achievement typically stresses the importance of accomplishment and attainment with effort involved [10]. Achievement motivation is therefore defined as the need to perform well or the striving for success and evidence by persistence and effort in the face of difficulties, achievement motivation is regarded as a central human motivation. Achievement Motivation in the school context can be defined as a driving force that accounts for students' behaviour in achievement situations. It determines the cognitive, emotional, and behavioral aspects of students' attainment and contribution to the process of education in the educational subsector [11].

Motivation is generally regarded as the drive to achieve targets and the process to maintain the drive. Motivation provides an important foundation to complete cognitive behaviour, such as planning, organization, decision-making, learning, and assessments. Tucker et al. [11] Viewed achievement motivation as a task-oriented behavior. Academic achievements of individuals are often compared against standards or with others for assessments. The differing perspectives of scholars result in various definitions of achievement motivation. Schick and Phillipson [12] Viewed achievement motivation as a general consensus that a distinct learning promotes academic performance in all students. The original definition of achievement motivation was from Atkinson (1964), who defined it as the

comparison of performances with others and against certain standard activities. Atkinson and Feather (1964) suggested that achievement motivation should be a combination of two personality variables; tendency to approach success and tendency to avoid failure. [13] Explained achievement motivation to be the drive to work with diligence and vitality, to constantly steer toward targets, to obtain dominance in challenging a difficult tasks and create sense of achievement as a result. [14] Claimed that achievement motivation may come from an internal and external sources while motivation can be a combination of factors that lead people to achieve their goals. Klose [15] explained achievement motivation as those factors that affect student's perceptions of their relationship to the achievement setting (e.g. the classroom).

Several internal and external factors could contribute to the student motivational orientation in the classroom. These include organizing the relationship between effort and ability; understanding the classroom reward structures; balancing academic mastery and social competence; and choosing task of appropriate difficulty. The conceptions students have about these factors change overtime. Adult learners need to be responsible for their decision and to be treated as capable of self-direction [16] Young children in primary grades are intrinsically motivated to achieve more competence, while students in secondary and adolescents are more extrinsically motivated. This shift in motivational orientations is caused by the need to reach academic competencies, to display the expected behaviour, or to protect one sense of self-worth. Achievement motivation is a need or seated urges that push us to behave the way we do [17].

Helmreich & Spence (2002) consolidated the theories concerning achievement motivation and compiled the Work and Family Orientation Questionnaire (WOFO). Meanwhile, they conducted a factor analysis and argued that achievement motivation consists of four elements, i.e. mastery of needs, work orientation, competition, and personal unconcern. After further studies, they found that the interaction of the first three elements is the key reason that contributes to excellent performance of individuals. It is highly related to personal achievements [18]; which according to them are as follows:

- Mastery of needs: An individual prefers jobs that are challenging, intellectually demanding, and thought-oriented. He or

she enjoys playing a leadership role in groups and is able to complete tasks already started.

- Work orientation: An individual takes a proactive attitude toward work and loves what he or she does. He or she obtains a sense of satisfaction from work and pursues self-realization and growth.
- Competition: An individual hopes for victory and has the desire to win over others.
- Personal unconcern: An individual does not consider success or stellar performance to be the cause or being rejected by others. In other words, there is no fear of success.

Motivation is therefore, a subjective and internal psychological drive, enabling individuals to pursue work they perceive to be valuable and prompting them to reach their goals. Motivation is also a mentality to compete and compare with others. Achievement motivation can also be viewed as a subjective, internal, and psychological drive, enabling individuals to pursue work they perceive to be valuable and eventually achieve their goals. Klose [15] found that motivation could have an influence on the formation of psychological contracts. Achievement motivation includes meaningful work, job security, and a sense of achievement, promotional channels, and opportunities. Over the years, behavioral scientists have noticed that some people have an intense desire to achieve something, while others may not be concerned about their achievements. Scientists have observed that people with a high level of achievement motivation exhibit certain characteristics. Achievement motivation is the tendency to endeavor for success and to choose goal oriented success or failure activities. However, Hosseini [19] had noticed that demotivating factors such as unemployment after school, social vices, which are prevalent among male students, both inside and outside the school could affect achievement motivation.

There is a general consensus in psychology that achievement motivation is an internal cohabitation or state that energizes and gives direction to behavior (Othman, 2011). Achievement motivation is also a want or desire that energizes and directs behavior towards a goal. It is a psychological process that leads us to do certain things [20]. Achievement motivation has been defined as the extent to which individuals differ in their need to strive to attain

rewards, such as physical satisfaction, praise from others and feelings of personal mastery. People with high achievement motives will act in ways that will help them to outperform others, meet or surpass some standard of excellence, or do something unique [13].

According to Abraham Maslow, when the need for love and belongingness is met, the individual can then focus on higher level needs of intellectual achievement. At that stage, the urge to learn increases (Woolfork, [21]. Achievement motivation therefore, is a significantly important factor for academic learning and achievement from childhood through adolescence [22]. accepted that, achievement motivation is an important contributor to students' achievement. Research has also shown that achievement motivation is related to various outcomes such as curiosity, persistence, learning and performance [23]. According to the self-determination theory [24], there are three types of motivation, namely, extrinsic motivation, intrinsic motivation, and a motivation.

Tella, [25] emphasized that achievement motivation is often correlated with actual achievement behaviour. The motivation to achieve, however, may evidence itself only in behaviour that children value; for example, a child may be highly motivated to achieve, and this may be exhibited in athletics but not in school work. Thus, different situations have different achievement attaining values for children. Highly motivated students are probably more inclined to learn the ways to cope with stress-related test situations than their less motivated peers [26]. Okoye [27], in Tella [25], opined that achievement motivation holds the key to the understanding of human behavior. According to Okoye, achievement motivation explains why one individual dodges work, another works normally satisfactorily enough to reach the height, while yet another resort to illegal and unconventional methods of achieving social, academic, economic and political recognition. He added that achievement motivation should be carefully manipulated whether in the work situation or study situation, so that our students are neither under motivated nor over motivated but appropriately motivated so as to be useful to themselves in their society and the world at large.

Achievement motivation forms the basis for a good life. People who are oriented towards achievement, in general, enjoy life and feel in control. Being motivated keeps people dynamic

and gives them self-respect. They set moderately difficult but easily achievable targets, which help them, achieve their objectives. They do not set up extremely difficult or extremely easy targets. By doing this they ensure that they only undertake tasks that can be achieved by them. Achievement motivated people prefer to work on a problem rather than leaving the outcome to chance. It is also seen that achievement motivated people seem to be more concerned with their personal achievement rather than the rewards of success.

In Nigeria, the importance attached to academic success in secondary school education can be seen in the anxiety of educators, teachers and parents over the achievement of students in external examinations such as the Senior Secondary School Certificate Examination (SSSCE). This is why the Federal Government of Nigeria places high premium on the Secondary level of education, which is evident in the establishment of National Examination Council (NECO) to conduct Senior Secondary School Certificate Examination (SSSCE) along the West African Examination Council (WAEC) for senior secondary school students in Nigeria. The same emphasis on education has led to the adoption of education as "an instrument par excellence" for effecting national development (Federal Government of Nigeria [28].

In view of the high premium placed on educational attainment by government and other stakeholders, students' underachievement or poor achievement in examinations, Mathematics has become a thorny issue that has attracted the attention of researchers and psychologists alike. The aim of psychologists and educators in this regard has been to determine the variables (both internal and external to the students) which are related to their educational achievements. In Nigeria, some external variables such as overcrowded classroom, inadequate facilities, unmotivated teachers, poor family background and so on, have been identified as likely factors influencing academic achievement of students [29].

### **1.1 Statement of the Problem**

Mathematic, as a compulsory subject at the secondary school level in Nigeria has not been recording an impressive performance by students in recent times. This has been worrisome to the stakeholders, considering the place of the subject in pursuing science and technological disciplines at the higher education

level. This is in addition, to the place of science and technology in the development of a modern nation. The seemingly poor academic achievement of senior secondary school (SSS) students in Mathematics in Nigeria, especially Edo State could be attributed to a number of factors, including: individual, family, community, cultural, and societal factors [25,30]. Despite the fact that these factors have been researched into and efforts made to arrest the situation, the problems seem unabated and this has become a great concern. Could other options like psychological concept of achievement motivation be effective? Hence, the justification of achievement motivation as the independent variable in the study. The problem of the study therefore, is whether achievement motivation could predict academic achievement of Senior Secondary School (SSS) students. In other words, could achievement motivation predicts students' academic achievement in Mathematics at the SSS level? The purpose of this study is to explore the predictive ability of achievement motivation and academic achievement of Senior Secondary School Students in Edo State.

### **1.2 Research Questions**

The following research questions guided the study:

- 1 What is the level of achievement motivation among Senior Secondary School Students in Mathematics in Edo State?
- 2 What is the level of academic achievement in Mathematics among Senior Secondary School Students in Edo State?
- 3 Does relationship exist between achievement motivation and academic achievement of Senior Secondary Schools' Students' in Mathematics in Edo State?

### **1.3 Hypothesis**

The following null hypothesis was tested in this study:

There is no significant relationship between achievement motivation and academic achievement in Mathematics among Senior Secondary School Students in Edo State.

## **2. METHODOLOGY**

The study adopted the correlation research design. This design is appropriate because the independent variable, achievement motivation, among senior secondary school students served as predictor of academic achievement. The

design helps to determine the extent and degree of correlation between achievement motivation and academic achievement. The population consists all public senior secondary students in Edo State, Nigeria. The total population of public senior secondary school students in Edo State, Nigeria is 84172 of 2014/2015, 2015/2016, 2016/2017 and 2017/2018 academic session. The sample size of this study is 2.5% of the entire population of 27, 937. Only the public schools were chosen to make for homogeneity. The sample size of this study was 2.5% of the entire population of 27,937, which is 698. The sample was drawn from the population, using the multi-stage sampling technique. Stage 1: Two Local Government Areas were chosen from each of the three Senatorial Districts, by using simple random sampling technique, which gave a total of six (6) Local Government Areas. Stage 2: Out of these six local government areas, two schools were selected using the simple random sampling technique. This gave a total number of twelve (12) schools. Stage 3: From the selected schools, 698 students' were proportionally sampled. Both independent and dependent variables were measured with relevant standardized instruments. To guide the study, three (3) research questions were raised and a null hypothesis was formulated. Data collected were analyzed using Pearson r correlation coefficient and Stepwise multiple regression statistical techniques. The results showed that achievement motivation predicted students' academic achievement in Mathematic.

## **3. RESULTS**

**Research Question 1:** What is the level of achievement motivation in Mathematics among Senior Secondary School Students in Edo State?

Table 1 shows the students' achievement motivation. The pooled mean values indicate that the students agreed to several of the statements in the table regarding their achievement motivation, since most of the mean scores are greater than 3.00. The statements with high level of agreement among the students' are the fact that "even when I feel that my lessons are difficult, I still try to do them" (mean = 3.99); "I work hard in class so that I can know more than other students about a subject" (mean = 3.83); "getting my SSSCE means I will be able to achieve my future goals (mean = 3,84); "I like to complete every assignment given to me and do it well" (mean = 3.78); "I am incited with good comments by my teacher" (mean = 3.73). However the statement with low level of

agreement is “I tend to become easily discouraged when I do not succeed in my academic work (mean = 2.76). From the table, it is clear that the average mean of male students is lower than that of the female counterpart due to the fact that male students seem to be uninterested in learning process due to social vices, lack of attention in class, and lack of effective communication on the part of the teacher. This could imply that the female students might be paying more attention in the class, and involved in fewer vices than the male counterparts.

Mathematics in mathematics among Senior Secondary School Students in Edo State?

The result in Table 2 shows that the academic achievement of students in mathematics among senior secondary school students in Edo State, Nigeria. It further shows that 8.1% of the students that failed and the 31.8% of the students that scored less than 50% have low level of academic achievement. The 57.7% that scored 50-69% have moderate level of academic achievement, while only 2.5% of the students that scored 70% and above have high level of academic achievement. This implied that the level of academic achievement in mathematics was largely moderate.

**Research Question 2:** What is the level of academic achievement (performance) in

**Table 1. Achievement motivation of SSCE students**

Statements	Sex						
	Male		Female		Total		Level
	Mean	SD	Mean	SD	Mean	SD	
Even when I feel that my lessons are difficult, I still try to do Them	3.96	1.24	3.99	1.15	3.95	1.20	High
I work hard in class so that I can know more than other students about a subject	3.77	1.20	3.89	1.12	3.83	1.16	High
Getting my SSCE means I will be able to achieve my future goals	3.77	1.24	3.82	1.23	3.79	1.24	High
I like to complete every assignment given to me and do it well	3.73	1.18	3.81	1.12	3.78	1.15	High
I am incited with good comments by my teacher	3.69	1.16	3.78	1.18	3.75	1.17	High
I want very much to prove to my parents and teachers that I am good academically	3.53	1.25	3.62	1.22	3.61	1.24	High
I Usually keep on working at a problem until I am sure I can solve it.	3.42	1.21	3.59	1.16	3.50	1.19	High
I like opportunities to compete with others for academic prize of honor	3.47	1.25	3.50	1.32	3.49	1.28	High
Even though an assignment is dull, I stick to it until it is completed	3.38	1.21	3.38	1.26	3.38	1.24	High
After classes I make it a definite point to look up things that were not clear in class	3.24	1.22	3.33	1.24	3.28	1.23	High
I have several times stopped doing a task because I thought I do not have the ability to do it well	3.34	1.25	3.13	1.31	3.24	1.28	High
If I have difficulty with my work, I try to discuss the trouble with my teachers.	3.01	1.32	3.16	1.30	3.09		High
I would rather avoid academic problems at which I have once failed than try it again.	2.91	1.35	3.08	1.35	3.00	1.35	Moderate
I do less work on a problem when it looks as if I don't know the answer	2.86	1.26	2.81	1.25	2.83	1.26	Low
I tend to become easily discouraged when I do not succeed in my academic work.	2.73	1.43	2.79	1.40	2.76	1.41	Low
<b>Average</b>	<b>3.38</b>		<b>3.44</b>		<b>3.41</b>		High

\*Agreed (mean >3.00)

**Table 2. Level of academic achievement in mathematics among SSCE students**

Score (%)	Male			Female			Total			
	Freq	%	Mean	Freq	%	Mean	Freq	%	Mean	Level
<= 39	34	10.1		21	6.1		55	8.1		Low
40 – 49	100	29.6		117	33.9		217	31.8		Low
50 – 59	138	40.8		134	38.8		272	39.8		Moderate
60 – 69	58	17.2		64	18.6		122	17.9		Moderate
70+	8	2.4		9	2.6		17	2.5		High
Total	338	100		345	100.		683	100		
Mean			51.3			52.3			51.8	Moderate

**Table 3. Pearson product moment correlation analysis of relationship between achievement motivation and academic achievement in mathematics**

Dependent variable	Mathematics test score		Probability level
	Correlation coefficient (r)	r <sup>2</sup>	
Students' achievement motivation	0.713	0.508	0.05

\*Correlation is significant at the 0.05 level ( $p < 0.05$ )

### 3.1 Test of Hypotheses

**Hypothesis:** There is no significant relationship between achievement motivation and academic achievement in Mathematics among Senior Secondary School Students (SSSS) in Edo State.

Correlation analysis was used to analyze the relationship between achievement motivation and their academic achievement in mathematics. The results presented in Table 3 shows that the correlation coefficient is 0.713, which is very high and significant at the 5% probability level. The coefficient of determination, ( $r^2$ ) is 0.508. The null hypothesis is rejected. It means that there is significant relationship between achievement motivation and academic achievement in mathematics.

## 4. DISCUSSION

The pooled result from the analysis suggests that students are in agreement to several of the statements regarding their achievement motivation since the mean scores are greater than 3.00. The grand mean is 3.41%, implying that on a general note, the students have high and positive achievement motivation. The same is true for both male and female students grand mean of 3.38 and 3.44 respectively. Female have higher achievement motivation scores than male. The high motivation could be attributed to the recent incentives being offered mathematics students and other science students. For example, admission to universities and

polytechnics is now on a ratio of 70:30 Science: Humanities. Similarly, no admission is granted to candidates to any postgraduate programme in most universities in the country without a credit Pass at the school certificate level. All these may have served as motivation to students to perform in the subject. In addition, female students seem to be less distracted unlike their male mates, whose values seem to be changing these days as a result of the changing social values of the society. Kusumu and Cate [7] had agreed that achievement of female students is higher than that of male, so that the quality of their engagement is more valuable. Awan (2011) stated that female are found by several studies to be more motivated to higher achievers than male. Theories have supported several empirical evidences that hold the view that achievement motivation is significant for students' academic achievement [31,13]. The correlation analysis in the shows that the correlation coefficient is 0.713, which is very high and significant at the 5% probability level. From the findings, achievement motivation contributed significantly to academic achievement among secondary school students. Achievement motivation predicts academic achievement positively. This significant impact is best understood when it is realized that learners who possess high level of achievement motivation are not intimidated. They usually view challenges encountered when carrying out complex assignment and projects as opportunity for growth and mastery. Again when they are faced with difficult situations such as failure, they continue to persist until they achieve success.

## 5. CONCLUSION

Based on the findings, it is concluded that achievement motivation can predict academic achievement of senior secondary school students. In other words, achievement motivation can prove to have a stronger relationship of students' academic achievement in mathematic.

## 6. RECOMMENDATIONS

Based on the findings of this study, the following recommendations are hereby made:

Students should be encouraged to build positive achievement motivation that will enhance their academic achievement.

Students should be encouraged to recognize their achievement motivation, this will enhance and improve their performance and it will give them the opportunity to compare their standard of performance with others.

Schools should be encouraged by organize seminars and field trips for students to enhance their achievement motivation, thereby fostering the academic success of students.

The government through the Ministry of Education should provide the needed facilities for schools to enhance a good and adequate environment for learning motivation.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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*The peer review history for this paper can be accessed here:*  
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