



Examination Anxiety as a Correlate of Public Senior Secondary School Students' Achievement in Mathematics and English Language

EZEONYE Sussan Chioma ¹

AHARA Obianuju L. ¹

¹*Department of Educational Psychology/Guidance & Counselling, Alvan Ikoku Federal University of Education, Owerri*

Abstract

In this study, the researchers investigated examination anxiety as a correlate of public senior secondary school students' achievement in mathematics and English language in Imo State Nigeria. To achieve the aims of the study, two research questions were asked and two corresponding hypotheses were formulated and tested. The study adopted a correlational design involving a simple and multiple linear methods. The population of the study is 94,963 students. The researchers drew a sample of 398 students from 18 selected secondary schools using multistage sampling technique involving purposive and simple random sampling techniques. Rating scale and achievement test were the instruments for collection of data. Five copies of the instruments were given to two specialists in the field of Education Measurement and Evaluation and three specialists in Educational Psychology, Imo State University, Owerri and Alvan Ikoku Federal University of Education, Owerri for validation. Reliability coefficients of 0.81 for PFS and 0.88 for MELAT were obtained using Cronbach Alpha and Kuder-Richardson Formula 20 (KR-20) respectively. The researcher used Pearson Product Moment Correlation Coefficient (PPMCC) and multiple linear correlation statistics to answer the research questions while t-test of the significance of Pearson r' and F-test of the significance of the coefficient of multiple correlation were used to test the hypotheses. The result revealed among others that examination anxiety has high but negative and non-significant coefficient of relationship with students' achievement in Mathematics and English Language. Based on the findings of this study, it was recommended, among others, that principals should implement strategies that foster a supportive and engaging learning environment in order to stimulate students' interest, build confidence, and cultivate a growth mindset, ultimately enhancing motivation and academic achievement in Mathematics and English Language.

Keywords: Examination anxiety, Growth mindset, Learning environment, Motivation

Introduction

Secondary school education occupies a very unique position in the educational system in Nigeria, because it is that level that determines the academic and professional career of individual student. Student achievement has become a hot topic in educational circle, especially with increased accountability for classroom teachers. Jain (2019) defines academic achievement or performance as the marks scored in subject. Academic achievement according to Santrock (2016) is frequently defined in terms of examination performance. Academic achievement refers to what the student have learned or what skills the student has learned and is usually measured through assessments like standardized tests, performance assessments and portfolio assessments. Ogbuanya, Attahiru, Tiough and Obe (2017) stated that achievement is the ability of somebody to gain or reach a set goal through effort, skill or courage. It implies the art or process of finishing something successfully. Success then, in the area of academics is what is referred to as academic achievement, usually assessed with achievement tests. In other words, achievement test is designed to measure a person's level of skill, accomplishment or knowledge in a specific area such as in Mathematics and English Language.

Mathematics on the other hand is one of the key subjects available in Nigerian secondary school curriculum. Due to value afforded to mathematics by the society, the subject has been made compulsory for all learners until the end of the secondary school course. Mathematical knowledge indeed equips individuals with the skill to solve a wide range of practical tasks and scientific problems that they may encounter in life. Mathematics is learned because of many reasons. Bed (2017) opines that mastery of basic mathematical skills is needed in order to cope with the demand of life. Such demands include being numerically literate, gaining tools for future employment, developing the prerequisites for further education, and appreciating the relationship between Mathematics and technology. It is the language of the sciences, and many disciplines depend on this subject as a symbolic means of communication. Adewumi, Olojo and Falemu (2022) opine that Mathematics plays an important part in developing students' general decision making and problem-solving skills. Several reasons for students' abysmal achievement in these subjects (English Language and Mathematics) have been highlighted and all the reasons are subsumed in psychosocial factors (Mtitu, 2014).

English Language is the language of education in Nigeria. It is the language of instruction from upper primary education, through secondary and tertiary education in Nigeria. It is regarded as a medium of communication, instruction and interaction. According to Asudu (2023), foreign languages such as English Language have always bridged the communication gap among bodies, technologically, politically, culturally, socially and economically. In Nigeria, apart from the fact that English Language is the official language used for the purposes of government and administration, it is also the language of communication and education at all levels. At the secondary school level, it is studied as a compulsory and core subject. It is also the medium of instruction in all school subjects. According to the National Policy on Education [NPE] (2013), English Language is a core subject that serves as a medium of instruction and a vital tool for communication, and is compulsory for all students at both the junior and senior secondary school levels.

Examination anxiety is a psychological condition in which people experience extreme distress, discomfort, and worry especially during test and examination periods. This form of psychological condition has contributed immensely to low academic achievement that is predominant among students in Nigeria. Onyeizugbo (2020) defines anxiety as an unpleasant emotion experienced as dread, scare, alarm, fright, trepidation, horror or panic. Examination anxiety is not entirely bad and in fact, a low level of examination anxiety is normal and necessary among the students in order to maintain focus and to galvanize them into action preparing, plotting and perfecting strategies that will guarantee optimum success in the examinations. Birjandi and Alemi (2020) noted that the examination anxiety is needed to motivate and help the students to stay mentally and physically alert. However, when the anxiety or level of arousal exceeds that optimal level, the result is decline in performance. It is when anxiety is in its severe form that some students experience genuine problem in academics. Their minds go blank, they experience the shakes, their hands go numb and they suffer from a number of sudden disabilities associated with anxiety during examination.

Statement of Problem

There is an increasing public outcry of students' poor academic achievement in school system especially the secondary schools. This problem could have many causes and it has educational, social, cultural and psychological dimensions. However, the students' low academic achievement in examinations can be seen as low or weakness of the students mark under the normal average in a study subject level as a result of a variety of reasons, including those related to the student himself or those related to psycho-social factors. In an ideal situation, students would be motivated to learn, free from excessive examination anxiety, and positively influenced by their peer group, while also benefiting from a supportive family structure and parents with a stable socio-economic status, all of which would contribute to enhanced academic achievement. This conducive environment would foster a love for learning, promote emotional well-being, and enable students to reach their full potential, leading to improved academic performance and overall success.

Purpose of the Study

The general purpose of the study was to investigate examination anxiety as correlate to achievement of public senior secondary school students in two core subjects in Imo State. The specific objectives include to:

1. determine the coefficient of relationship between examination anxiety and students' achievement in Mathematics and English Language.
2. to ascertain the co-efficient of relationship among content/method of teaching, mode of test and examination, achievement motivation, students' self-concept, examination anxiety and students' achievement in Mathematics and English Language.

Literature Review

Anxiety is a general feeling of apprehension or dread accomplished by predictable physiological changes. Anxiety is an aspect of emotions in which there is fear and uncertainty about the future. Anxiety is a painful uneasiness of mind concerning impending or anticipated ills on the part of the students. According to Olah and Utibe (2022), anxiety is marked by uneasiness and apprehension form which the students cannot escape. It is accompanied by feeling of helplessness because the anxious student feels blocked, unable to find a solution to the problem. For students who suffer from mathematics anxiety, psychological symptoms such as sweaty palm, nausea, muscle contractions, difficult breathing, tiredness in the throat, headaches, heart palpitations, restless behaviors, forgetfulness and a temporary boost in one's heart rate are familiar (Alakayleh, 2017), when anxiety is associated with questions structured to elicit behaviour, it becomes test anxiety. Test anxiety is the feelings of fear and nervousness associated with bodily symptoms that interfere with solving mathematical problems in classes, examination, tests and also in daily activities that may involve geometric calculation.

From all indications, examination anxiety appears to be a force confronting student. Rana and Mahmood (2021) note that students with anxiety attempt to manage the devastating effects of their anxiety by playing truancy in school. This led to a few numbers of students in mathematics and ultimate few career choices in discipline that are mathematically dependent. Indeed, according to Syokwaa, Aloka and Ndunge (2014) findings, many students in their final examinations at the end of secondary school education have the most anxiety-inducing experiences in their programmes of study. The study added that this is because throughout their secondary education they managed their test anxiety by playing truancy and in their final examination truancy was not possible, their phobia for this final test confronted them with anxiety. Owan, Nwannunu and Madukwe (2018) define test anxiety in mathematics as feelings of tension and worries that interfere with the manipulation of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations which cause one of forget and loose one's self-confidence in a test condition.

Examination anxiety is a learned behaviour, which can be unlearned. Factors that can create test anxiety are: parents, friends or teachers that may pass their biased ideas to the students to make them believe that there is a connection between grade and self-worth. The fear of alienation by parents, family or friends due to poor performances induces, anxiety on the students making them feel that they are not in control. Angel (2018) contends that anxiety constitute of the student academic failure in the society.

The consequences of anxiety to students' academic problems cannot be underrated. Mercy (2015) defines anxiety as psychological mechanism whereby the current intensification and dangerous drive result in the elicitation of defenses. Anxiety is also a construct that simply means a state of extreme abnormal fear or phobia. It is also a state of the nervous system that is manifested by cardiovascular, respiratory and gastro intestinal symptoms. Yet to others anxiety remains as an unpleasant to overriding mental tension that has no apparent and identifiable cause, while others viewed it as exaggerated fear of objects or situation in which the danger is magnified out of proportion (Chipas, 2016).

Anxiety is a collection of physiological and cognitive reactions that formed worry, fear of failure and stomach upset. It is an epidemiology that has eaten deep into the fabric of students' life and at the same time, become a barrier to their progress. Furthermore, anxiety is a notable threat on students' achievement and if not properly curbed, it will continue to jeopardize the effort of the student, by presenting them as a societal mockery. Anxiety originated from unconscious conflict and serves as signal to unconscious impulses that may lead into consciousness. However, sometime some students even at high educational level and with high level of mental cognitive skills inexplicably fail to showcase the knowledge they have acquired during technical and learning because of anxiety actions, such as observation or record regarding anxiety functions towards students that can lead to total dropout and self-withdrawal from academic study from the students. Therefore, anxiety regulations towards student performance in the examinations can be detrimental to the student future, if not properly checked. Anxiety is regarded as a general term for several disorders that results to nervousness, phobia and worry (Iwundu & Agi, 2021). Dokubo (2014) asserts that anxiety is an unpleasant state of inner turmoil often accompanied by nervous behaviour such as passing back and forth, stomatic complaint and rumination. It is a feeling of disturbed, uneasiness which people noticed as a result of overreaction to situation that is subjectively seen as menacing.

Anxiety when it is mild is acceptable and assists to motivate an individual and prepares the body physically, behaviourally and cognitively to fish out and act decisively with threats to survival, but clear anxiety can be terribly debilitating or destructive which can affect daily living of the individual lives., anxiety helps to make students inactive by clamping down on their natural talents thereby subjecting them into academic mockery in the society. Anxiety according to John (2016) is inimical to structure performance in list and examination. He opined that anxiety deals decisively with the student potentialities and also make some of the students to drop out of school. Anxiety institutes fear and discouraging spirit that scares student away from taking their academic study serious. The activities of anxiety towards students are inimical to academic progress and help the students to be dull in the class. The academic achievement of the student in tertiary, secondary and primary schools is in double because of the destructive nature of anxiety which has become a total spiritual disease or epidemiology that has eaten deep into the fabric of students' lives. Chinonso (2014) asserts that children or wards that are academically inclined are afraid to exhibit their talents because of anxiety. In fact, anxiety is a social notable scourge that helps to sink students' inner academic potentialities, thereby presenting them as dull and ineffective.

In education, students' educational outcomes and achievement are evaluated and graded using examinations/tests. Chinta (2015) asserts that examination is common in everyday life as students have to take many highly competitive centralized and high stakes examination such as the Common Entrance Examination (C.E.E.), First School Leaving Certificate Examination (F.S.L.C.E.), Junior Secondary School Certificate Examination (J.S.C.E), Senior Secondary School Certificate Examination (S.S.C.E.), Unified Tertiary Matriculation Examination (UTME), and a host of others. These series of examinations play a dramatic role in the lives of students and their parents. In other words, achievement in these high stakes examinations is crucial for moving from one level of education to another, and also to gain access into prestigious careers. Such practices in most cases, in the view of Ibeawuchi and Iruloh (2017), put considerable pressure on the students. This form of anxiety is known as test anxiety which Spielberger (1980) defined as a situation- specific trait that refers to the anxiety states and worry conditions experienced during examinations. The level of anxiety can fluctuate over time in response to both internal and external stimulation. Ngwoke, Ossai and Obikwelu (2023) succinctly observed that many Nigerian students at all levels exhibit high level of test anxiety in testing conditions. This often resulted

in debilitating anxiety, high proneness to cheating in examination and consequently low academic achievement. Anxiety related behaviour during testing conditions may in one way or another affect academic achievement of students. Indeed, a minimal amount of anxiety is needed to mobilize human beings to respond rapidly and efficiently; but when in excess, it may foster poor response and even inhibit response. Hence, too much anxiety during test may interfere with students' concentration on the test, thus lowering their achievement in examination (Cassady & Johnson, 2012).

Anxiety triggers the physiological stress response, which can impede memory recall. Morakinyo (2015) observes that anxiety is caused by both internal and external stimuli. The internal stimuli compose of feelings of thoughts and events and what goes on around. External stimuli compose of environmental situations which give some concern of fear which cover general events about life. Oresanya (2017) affirms that anxiety may also arise when there is frustration occurring in some major life problems related to vocational, educational or adjustment. Excessive test anxiety may occur when the teachers threaten the students with a test. Spielberger and Sarason (2019) state other factors that contribute to the development of test anxiety, among which are; self-concept, self-awareness, self-image, peer factors and so on. If an individual's experience is negative, then the test anxiety level will be higher leading to lower performance. Consequently, if an individual's experience is positive, then, the test anxiety level will be lower leading to higher performance. Above all, it is important to consider motives, aptitudes, cognitive assessment of the task and past experience when analyzing test anxiety and how it relates to students' achievement.

Anxiety is a physiological condition in which students experience extreme stress, anxiety and discomfort during and/or before taking a test. These responses can drastically hinder an individual's ability to perform well and negatively affect his social, emotional and behavioural development and feelings about himself and school. Putwain and Best (2021) observe that children performed poorer in high threat situations and experienced more test anxiety and worrisome thoughts than when they are in a low threat environment. Also, Kendra (2022) notes the possibility of test anxiety forming a vicious cycle; that is, the possibility that after experiencing test anxiety on test, the student may experience more anxiety on another test than he or she experienced on the previous test. Such student may feel helpless if the cycle continues without him or her seeking for professional help. When test anxiety is higher, low academic achievement among students becomes inevitable. It then follows that a moderate level of test anxiety is essential to curb poor academic achievement. Cassady (2015) observes that significant impact of cognitive test anxiety on performance exist in conditions with and without external evaluative pressure and the impacts are stronger in those conditions with external evaluative pressure. This means that test anxiety interferes with learning through deficiencies in encoding, organization and storage in addition to the classic interpretation of retrieval failures. High level of test anxiety is associated with such components as assignment, worry (cognitive) components during stressful activities that subsequently lead to interruption in the performance of the students and reduction of efficiency.

It is evident from the work reviewed that cognitive test anxiety has connection with academic achievement among students owing to the fact that test may create irrelevant thought, decreased attention and concentration which may lead to students' inability to attempt the questions properly. Falaye (2016) observes that if before or during a test, a student's level of anxiety is above the optimum level, he may fail to demonstrate his true abilities. Under such circumstances fear of the actual test may disrupt preparation and cause great amount of distress during the test that is more than likely to impair his ability to attain high scores. In other words, students who suffer test anxiety are more likely to experience negative cognitive while in evaluative situation. In all, poor academic achievement among students may arise not because of intellectual problems or poor academic preparation, but as a result of the means by which the examination is been constructed which create a sense of threat for those experiencing anxiety. Many of the students experiencing anxiety often have to put forth extra effort in order to perform well because they are trying to manage their anxiety while performing a task. Anxiety in the context of this study is therefore defined as a psychosocial factor in which students experience intense fear, worry and concern during a test or exam in English Language and Mathematics. Thus, that feeling of nervousness is perfectly normal response that nearly everyone experiences when faced with

any challenging task. If these experiences persist, it can constitute a serious problem that could lead to poor academic achievement of the students involved, hence the need to pay attention to it.

Abraham Maslow's Motivation Theory

However, people who have difficulty achieving very basic physiological needs (such as food, shelter, etc.) are not capable of meeting higher growth needs. Maslow looks at the complete physical, emotional, social, and intellectual qualities of an individual and how they impact on learning. Abraham Maslow saw human needs in the form of a hierarchy ascending from the lowest to the highest and concluded that what causes people to behave as they do is the process of satisfying needs. Relating this theory to the current study, a learner under motivated condition exhibits purposeful behaviour aimed at achieving the set goals.

Research Design

The study adopted a correlational design involving a simple and multiple linear methods. The population of the study is 94,963 students in all the 296 public senior secondary schools in Imo State. The researcher drew a sample of 398 students from 18 selected secondary schools. The sample size was derived using Taro Yamane formula. Purposive and simple random sampling and proportionate sampling techniques were used to select the respondents. Rating scale and achievement test are the instruments constructed by the researcher for collection of data. The instruments were validated by five research specialists. Reliability coefficients of 0.81 for PFS and 0.88 for MELAT were obtained using Cronbach Alpha and Kuder-Richardson Formula 20 (KR-20) respectively. The researcher with the aid of three trained research assistants administered the instrument and adopted on-the-spot collection which assured 100 per cent retrieval of the instruments. The researcher used Pearson Product Moment Correlation Coefficient (PPMCC) and multiple linear correlation statistics to answer the research questions while t-test of the significance of Pearson r' and F-test of the significance of the coefficient of multiple correlation were used to test the hypotheses.

Research Question One: What is the coefficient of relationship between examination anxiety and students' achievement in Mathematics and English Language?

Table 1: Summaries of Pearson "r" statistics used to explain the coefficient of relationship between examination anxiety (X) and students' achievement in Mathematics and English Language (Y)

V	N	Σ	r	MR	DR	Remarks
X	398	8826	-0.66	High	Negative	High Negative Relationship
Y	398	8670				

Size (n), Summation (Σ), Coefficient (r), Magnitude of Relationship (MR), Direction of Relationship (DR) and Remarks

In Table 1, the data shows the summaries of Pearson r used to describe the coefficient of relationship between examination anxiety and students' achievement in Mathematics and English Language. The result recorded an index of -0.66 which was realized for the coefficient of relationship between the two variables (examination anxiety and students' achievement in Mathematics and English Language). Therefore, the answer to the research question is that there is a high but negative coefficient of relationship between examination anxiety and students' academic achievement in Mathematics and English Language in public senior secondary schools in Imo State, Nigeria.

Hypothesis One

Ho¹: The coefficient of relationship between examination anxiety and students' achievement in Mathematics and English Language is not significant.

Table 2: Summaries of t-test of significance of Pearson “r” used to test the coefficient of relationship between examination anxiety and students’ achievement in Mathematics and English Language

V	N	Σ	R	α	df	t_{cal}	t_{tab}	Decision
X	398	8826	-0.66	0.05	396	-1.522	1.96	Upheld H_0
Y	398	8670						

Sample Size (n), Summation (Σ), Coefficient of Relationship (r), Alpha Level (α), Degree of Freedom (df) and t-test of Significance of Simple Linear Correlation between two Variables

Data on Table 2 showed the result for the t-test of the significance of the coefficient of relationship between examination anxiety and students’ achievement in Mathematics and English Language. The result gave the degree of freedom as 396 and the t-calculated value as -1.522 and the t-tabulated value as 1.96. Since the t-calculated value is less than the t-tabulated value, the researcher upheld the null hypothesis; therefore, infer that the coefficient of relationship between examination anxiety and students’ achievement in Mathematics and English Language is not significant in public junior secondary schools in Imo State.

Research Question Two: What is the extent of joint relationship among motivation, examination anxiety, peer group influence, family structure, parental socio-economic status and students’ achievement in Mathematics and English Language?

Table 3: Summaries of multiple linear relationships among content/method of teaching (x_1), Mode of test and examination (x_2), achievement motivation (x_3), students’ self-concept (x_4), students’ anxiety(x_5) and students’ achievement in Mathematics and English Language (Y)

V	N	Σ	r	MR	Remarks
X_1	398	5890	0.402	Moderate	Moderate Relationship
X_2	398	8826			
X_3	398	8812			
X_4	398	5806			
X_5	398	6123			
Y	398	8670			

Variables (V), Size (n), Summation (Σ), Multiple Linear Correlation (R), Magnitude of Relationship (MR) and Remarks

Data in Table 3 shows the summaries of multiple linear relationships used to describe the extent of joint relationship among content/method of teaching, Mode of test and examination, achievement motivation, students’ self-concept, students’ anxiety and students’ achievement in Mathematics and English Language. A look at the result shows that an index of 0.402 was realized for the relationship among content/method of teaching, Mode of test and examination, achievement motivation, students’ self-concept, students’ anxiety and students’ achievement in Mathematics and English Language. The result from the table indicates that the magnitude of the relationship is moderate. This indicates that an increase in one variable is likely to lead to some measure of increase in other variables and a decrease in one variable could also lead to some measure of decrease in other variables, implying a strong association among the variables. Therefore, the answer to the research question is that there is a moderate extent of joint relationship among content/method of teaching, Mode of test and examination, achievement motivation, students’ self-concept, students’ anxiety and students’ achievement in Mathematics and English Language in public senior secondary schools in Imo State, Nigeria.

Conclusion

There is moderate, positive and significant joint relationship among content/method of teaching, Mode of test and examination, achievement motivation, students' self-concept, students anxiety and students' achievement in Mathematics and English Language in public senior secondary schools in Imo State, Nigeria. These low relationships are proof that the combined influence of motivation, examination anxiety, peer group dynamics, family structure, and parental socio-economic status on students' achievement in Mathematics and English Language is relatively weak, indicating that no single factor or combination of factors overwhelmingly predicts academic success. Instead, students' achievement in these subjects appears to be influenced by a complex interplay of various factors, with each factor contributing modestly to overall academic performance, highlighting the need for holistic and multifaceted support strategies.

Recommendations

Principals should implement strategies that foster a supportive and engaging learning environment, such as setting achievable goals and rewards, providing constructive feedback and praise as well as recognizing and celebrating individual progress and successes in order to stimulate students' interest, build confidence, and cultivate a growth mindset, ultimately enhancing motivation and academic achievement in Mathematics and English Language.

Teachers should incorporate anxiety-reducing interventions into their teaching practices. This can include providing mindfulness and relaxation exercises, test-taking strategy training, and gradual exposure to simulated test conditions to help students become familiar with the exam format. Additionally, modifying assessment methods, such as using frequent low-stakes quizzes, project-based evaluations, flexible assessment timelines, and open-book or take-home exams, can also help alleviate students' anxiety.

Principals should foster a positive and inclusive school culture that encourages collaborative learning and minimizes harmful peer influences. This can be achieved by promoting a growth mindset, encouraging open communication, and creating opportunities for students to engage in group projects and discussions that value diverse perspectives and problem-solving approaches in order improves on their academic success

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