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Academic Procrastination as Predictor of Mathematics Anxiety of Pupils in Enugu State, Nigeria

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Abstract

The study investigated academic procrastination as a predictor of mathematics anxiety of Primary four pupils in Nsukka Local Government Education Authority, Enugu State, Nigeria. Two research questions and two null hypotheses guided the study. The design is correlational survey research design. 103 public primary schools with a population of 12840 primary four pupils in the area was used for the study. A stratified sampling and simple random sampling techniques were used to draw 346 primary four pupils which was used for the study. A Questionnaire with two clusters was the instrument used for this study- academic procrastination inventory (API) and Mathematics Anxiety scale (MAS). The instrument was validated by three experts in the faculty of Education, University of Nigeria, Nsukka. Cronbach alpha reliability was used to determine the internal consistency of the instruments which yielded 0.87 and 0.91 respectively. Research questions were analyzed using Pearson r and R-square while the hypotheses were tested using analysis of variance (ANOVA) at 0.05 probability level. It was found that academic procrastination significantly predicts mathematics anxiety and that gender has no significant predictive power on pupils' mathematics anxiety. It was recommended among others that lessons must be presented in a variety of ways to help pupils perceive mathematics as a pleasurable activity, to make the joy of mathematics to remain permanently with them and to ensure the development of a sustainable educational system. Moreover, teachers, parents, psychologists and counselors should help to inculcate and strengthen confidence, competence, effective use of time, good organization and the likes to avoid procrastination among these pupils.

Keywords: Academic, Procrastination, Anxiety and Mathematics.

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1. Introduction

English and Mathematics are the most common and compulsory subjects in primary and secondary schools precisely in Nigeria. If students are asked to mention the most valuable subjects in their lives, they are most likely to mention Mathematics, followed by language arts - English, literature and science. Mathematics and English are certainly the two core subjects in schools (Jones, 2013). Regrettably, Mathematics which is one of the core subjects has pissed off some people when they think about it. Some even conclude that they are not good at Mathematics.

Mathematics has been explained by Asikhia (2013) as a broad domain addressing the measurement, properties and relations of quantities as expressed in numbers or symbols. Similarly, Hom (2013) stated that mathematics is the science that deals with the logic of shape, quantity, and arrangement. Moreso, mathematics is all around individuals in all they do. It is the building block for every thing in people's daily lives including mobile devices, architecture, art, money, engineering and sports. Akinsola and Tella (2007) stated that mathematics is an important school subject because it is associated with more academic or career opportunities and it is one of the compulsory subjects and a mandatory requirement for admission in higher institutions. No wonder, Agwah and Usman (2002) relates importance of mathematics to the scientific, industrial, technological and social progress of any society. It is an undisputable fact that mathematics is an important subject. Regrettably, in recent time, some students perform abysmally poor in mathematics.

The inability to learn mathematics or persistent failure in mathematics has led to the phenomenon of mathematics phobia in primary schools in Nigeria. Most pupils have conditioned their mind or have erroneously believed that mathematics is difficult. Given the findings of Maxwell, Bellissimo (2005) that ones perception of any task especially at the beginning affects the outcome more than anything else, the poor performance of students in mathematics tests and examinations may continue as long as pupils perceive mathematics as a difficult and dreaded subject. Elekwa (2010) opined that mathematics is not only feared but also hated by school pupils, resulting in declining performance in the subject. Elekwa further explained that a learners' confrontation with a perceived difficult learning experiences seems to increase in the learners' anxiety and could as well result in a carefully planned evading actions like truancy, skipping lessons and not doing assignment, inattention, dormant, anxiety, neither asking nor answering questions in class.

Research has revealed that majority of primary and secondary school students procrastinates especially in the study of mathematics, probably because they perceive it as a difficult subject (Agwah and Usman, 2003). Olubusayo (2010) argues that mathematics by its nature involves both cognition and affective effects and the glory of mathematics lies in the fact that mathematics requires hardwork and perseverance. It is in the struggle to understand; this perserverance that one gets equipped in the knowledge of mathematics while some students who are not resilient in this struggle begin to dislike mathematics as a subject. This assertion is supported by Solomon and Rothblum (1984) who posit that people tend to avoid tasks which they find unpleasant and engage in activities which are more rewarding especially with short-term over long term gains. This is also supported by Hopper (2005) and Phillips (2000) who discovered that mathematics to some students is often associated with pain and frustration and this may account for the reason why they experience anxiety in studying mathematics.

Anxiety, however, is a general term for several disorders that cause nervousness, fear, apprehension and worry. These disorders affect feeling, behaviour and manifest real physical symptoms. It could also be explained as a feeling of worry, nervousness, or unease, typically about an imminent event or something with an uncertain outcome, a desire to do something typically accompanied by unease (Crosta, 2009). Crosta further explained that anxiety can seriously inhibit learning and performance especially on tests or examination. The main source of anxiety in school is fear of failure. Richardson and Suinn, (1972) elaborated feelings of tension and anxiety that interfere with the manipulation of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations. Smith (1997) characterizes mathematics anxiety in a number of ways ranging from uneasiness when asked to perform mathematical task, to avoidance, feeling of physical illness, dread and panic, thus theoretical models of mathematics anxiety have multidimensional forms that incorporate attitudinal (dislike), cognitive (worry) and emotional (fear) aspects, (Hart, 1989; Wigfield & Meece, 1988). Mathematics anxiety is more than a dislike for mathematics (Vinson, 2001). An anxious student may encounter difficulty in using or transferring

knowledge or demonstrating knowledge on tests. In support of the above assertion, Hopp (2013) reported that most students who have an unbearable fear of maths, have never been good at maths and cannot learn it.

Mathematics anxiety, therefore, is a feeling of tension, apprehension or fear that interferes with mathematics performance (Ashcraft, 2002). This can be characterized by uneasiness when asked to perform mathematical tasks, and avoidance of math classes, feeling of physical illness, faintness, dread or panic and inability to perform on a test. Ashcraft further explained that students' fear of maths relates to test taking and performance anxiety. It then becomes imperative to address the problem at this concrete operational stage. According to Ngwoke and Eze (2004) a concrete operational child has started operating on concrete objects and events and not on verbally expressed hypotheses. At this time, elementary-age and preadolescent children demonstrate logical, concrete reasoning. Children's thinking becomes less egocentric and they are increasingly aware of external events. They begin to realize that one's own thoughts and feelings are unique and may not be shared by others or may not even be part of reality. Children also develop operational thinking - the ability to perform reversible mental actions. In practical, the child can count, measure, add and subtract. They can even sort objects into classes (such as tools, fruits and vehicles or largest-smallest). However, (Erikson, 1983) each stage builds upon the successful completion of earlier stages. The challenges of stages not successfully completed may be expected to reappear as problems in the future therefore a child ought to be exposed to opportunities to successfully resolve each stage to avoid regression.

Bluman (2011) revealed some of the physical symptoms of maths anxiety as nervousness, pounding heart, rapid breathing, sweating, nervousness, stomach upset, tenseness. The mental symptoms include a feeling of panic or fear, cloudy or fuzzy thinking, lack of concentration, a mental block in thinking and feeling of helplessness, guilt, shame, inferiority or stupidity. Bluman noted that mathematics anxiety is very real and can hinder students' progress in learning mathematics and could progress till adulthood. This could be attributed to students' postponement or procrastination in mathematics related activities as they perceive it to be difficult. It was revealed by Akinsola, Tella and Tella (2007) that students who procrastinate resist completing assignment and other deadlines that create tension and anxiety. Also, Akinsola, Tella and Tella (2007) observed that many students refer to mathematics as being difficult and consequently, procrastination often results when a task seems difficult, unpleasant or overpowering. This is especially true of children who often prefer pleasurable times to being constrained to do something.

Procrastination has been perceived as a dispositional trait which has cognitive, behavioural and emotional components. This dispositional trait makes an individual postpone doing things that make him or her anxious and apprehensive. Procrastination therefore, is the practice of carrying out less urgent tasks in preference to more urgent ones, or doing more pleasurable things in place of less pleasurable ones, and thus putting off impending tasks to a later time (Popoola, 2005). Freud (1953) revealed that the pleasure principle may be responsible for procrastination; humans prefer to avoid negative emotions and delay stressful tasks. The belief that humans work best under pressure provides an additional incentive to postponement of tasks. Noran (2007) opined that procrastination could be caused by lack of time management, uncertainty of priorities, goals and objectives, inability to concentrate, low levels of conscientiousness on one's work, student's characteristics, lack of confidence, fear and anxiety related to failure.

Academic procrastination is the act of needlessly delaying academic tasks to the point of experiencing subjective discomfort. Academic procrastination has been assessed on the measurement of study habits such as minutes spent studying and lessons completed in self-paced instruction courses. However, gender is another crucial issue that is yet inconclusive and controversial. One does not know the gender difference with regards to academic procrastination of mathematics anxiety of primary school pupils.

Gender is a range of characteristics distinguishing between male and female, particularly in the cases of men and women and the masculine and feminine attributes assigned to them. From a wider picture, the term gender refers to a socio cultural classification of women and men. This classification is based on societal norms and values that define the roles men and women should play in society (Ashcraft, 2002). Ashcraft further revealed that younger female scholars have been thought to develop anxiety towards mathematics and sciences when they become more interested in social

relations in their teen years. Ashcraft further observed that women experience more anxiety in mathematics as a group than men. There is a stereotype that women score less than men when they take math exam. Campbell, Reese, O'Sullivan, & Dossey (1996) pointed out that boys and girls have similar mathematics and science proficiency scores on tests at the age of 9. It was further asserted that there was no measurable difference in the math proficiency of 13-year-old boys and girls.

Gender differences in mathematics anxiety have been extensively studied. The results are inconsistent, with a number of studies reporting that females have higher levels of mathematics anxiety than males (Alexander & Martray, 1989) and others not confirming significant differences. Baloglu and Kocak (2006) found that gender effects of mathematics anxiety varied with the context. Devine, Fawcett, Szűcs & Dowker (2012) revealed no gender differences emerged for mathematics performance but levels of mathematics anxiety were higher for girls than for boys. Girls and boys showed a positive correlation between mathematics anxiety and test and test anxiety and negative correlation between mathematics anxiety and mathematics performance. Regression analyses revealed that mathematics anxiety was a significant predictor of performance for girls but not for boys. However, gender differences with regards to mathematics anxiety is still inconclusive, one does not know the predictive power of gender on mathematics anxiety. Therefore, the aim of this study is to ascertain the predictive power of academic procrastination on mathematics anxiety among primary school pupils in Nsukka Central Education Authority, Enugu State, Nigeria.

2. Statement of the Problem

Researchers have found that in recent times, most students suffer from academic procrastination which is an avoidance coping behaviour. These students often have many problems with their academic performance especially in mathematics which is erroneously perceived as a difficult subject. This problem however, could result in mathematics anxiety. Mathematics anxiety has been found to develop in the early school years. It is thought to affect a notable proportion of the school age population and run throughout their years in school.

Regrettably, mathematics anxiety has several negative effects on students' education especially among pupils. For example, people who experience high levels of mathematics anxiety are likely to develop negative attitudes toward tasks involving mathematics, drop out of elective mathematics classes or avoid taking them altogether. Therefore, if not controlled early enough, could result in high mathematics anxiety which has been attributed have resulted from academic procrastination and they therefore avoid pursuing careers that require quantitative skills which could have a tremendous implication on the child's future and the society at large. These problems, however, may have large-scale implications and directly or indirectly reveal the predictive power of academic procrastination on mathematics anxiety. However, the problem stated in question form therefore is, what is the predictive power of academic procrastination on mathematics anxiety? It appears however, that there is no available study on academic procrastination as a predictor of mathematics anxiety among primary school pupils in Nsukka Central Education Authority, Enugu State, Nigeria. Therefore, the general purpose of this study is, to investigate the predictive power of academic procrastination on mathematics anxiety. In doing this, the difference between male and female pupils in Nsukka Central Education Authority, Enugu State will also be investigated.

3. Research questions

The following research questions were posed to guide the study

1. What is the predictive power of academic procrastination on mathematics anxiety of primary school pupils?
2. What is the predictive power of academic procrastination on mathematics anxiety of male and female school pupils?

4. Hypotheses

The following two null hypotheses tested at 0.05 probability level guided the study:

Ho₁: Academic procrastination has no predictive power on mathematics anxiety of primary school pupils.

Ho₂: There is no predictive power of gender on mathematics anxiety of primary school pupils.

5. Method

This study is descriptive correlational survey research design. A correlational survey research design according to Bernstein, Penner, Clarke-Stewart and Roy (2006) examines relationships among variables in order to describe research data more fully, to test predictions, to evaluate theories, and to suggest new hypotheses about why people think and act as they do.

A population of 103 public primary schools with 12840 primary four pupils in Nsukka Local Government Education Authority in Enugu State, Nigeria was used for the study. Stratified sampling technique was applied to divide the school into a homogenous subgroup before sampling. Furthermore, simple random sampling was used to draw 10 schools from the 103 public primary schools, one primary five class was finally drawn from each of the ten schools. This gave rise to 346 pupils which were used for the study. Questionnaire was the instrument used for the study; it has two clusters, one is academic procrastination inventory (API) by Aitken (1982) and the second is Mathematics Anxiety scale adapted from Richardson and Suinn (1972). These instruments with 19 and 23 items were adapted by the researchers and used for the study. The statements are rated on a 4-point likert-type scales ranging from Very Often 4-points; Moderately Often 3 points; A Little 2-points; Rarely 1-point. Negatively skewed items were reversed during the analysis. The instrument was validated by three experts in the faculty of Education, University of Nigeria, Nsukka. Cronbach alpha reliability was used to determine the internal consistency of the instruments which yielded 0.87 and 0.91 respectively. Research questions were analyzed using pearson r and R-square. The hypotheses were tested using analysis of variance (ANOVA) at 0.05 probability level. For each respondent, an overall mean score for all the items was computed. An overall mean score of 2.5 and above showed that the pupils' academic procrastination and gender significantly predict their mathematics anxiety whereas below 2.5 showed no significant prediction of pupils' academic procrastination or gender and their mathematics anxiety.

6. Results

Results of the study were presented in line with the research questions and corresponding hypotheses as follows. Table one presents data elicited by research question one.

Research Question 1

What is the predictive power of academic procrastination on mathematics anxiety of primary school pupils?

Table 1: Academic procrastination as a predictor of mathematics anxiety of pupils.

Pupils' academic Procrastination	N	df	t-value	Mean Square	Adjusted R-Square
Mathematics Anxiety	346	353	42.518	.894	.837

Table 1 shows the predictive power of academic procrastination on mathematics anxiety of pupils. It reveals that the t-value is 42.518 at 353 degree of freedom and 263 mean square. This shows that the predictive power of pupils' academic procrastination on their mathamatics anxiety is positive and strong. The adjusted R- square which is the magnitude of the prediction of academic procrastination on mathematics anxiety is shown to be .837. the adjusted R-Square which is shown to be .837. means that the predictor variable contributes 84% which reveals a high predictive power of academic procrastination on pupils' mathematics anxiety, and the remaining 16% could be as a result of other minute factors. This reveals that pupils' academic procrastination significantly predicts their mathamatics anxiety. The corresponding hypothesis which predicted a non significant predictive

power of pupils' academic procrastination on their mathematics anxiety was further subjected to (ANOVA) as shown in table 2 below.

Hypothesis One

Academic procrastination has no predictive power on mathematics anxiety of primary school pupils.

Table 2: Analysis of variance (ANOVA) analysis of the pupils' academic procrastination on mathematics anxiety.

Academic Procrastination	t-value	Pearson r	Better value	Sig. (2-tailed)	Decision
Mathematics Anxiety	-.381	.020 ^a	.38192	.703 ^b	Rejected

The relationship between pupils' academic procrastination on their mathematics anxiety is positive and linear. This was shown in the correlation between observed value predictor variable (academic procrastination) and the criterion variable which is mathematics anxiety, the Pearson's correlation coefficient (r) is .020^a which is significant at .703^b, this was above the 0.05 probability level at which the null hypothesis was tested. Therefore, the hypothesis "Academic procrastination has no predictive power on mathematics anxiety of primary school pupils" is therefore rejected. The result revealed a significant predictive power and relationship of pupils' academic procrastination on their mathematics anxiety. The null hypothesis of no significant predictive power of pupils' academic procrastination on their mathematics anxiety is therefore rejected.

Research question 2

What is the predictive power of gender on mathematics anxiety of primary school pupils?

Table 3: Gender as a predictor of mathematics anxiety of pupils.

Pupils' Gender	N	df	t-value	Mean Square	Adjusted R-square
Mathematics Anxiety	346	353	-.381	.894	-.002

Table 3 reveals the predictive power of gender on mathematics anxiety of pupils. It indicates that the t-value is -.381, degree of freedom is 353, and the mean square .894. The adjusted R-square of -.002 which is the magnitude of the prediction reveals that the predictive variable contribute .02% to pupils' mathematics anxiety and the remaining 98% could be as a result of other major factors. This shows that the predictive power of gender on pupils' mathematics anxiety is negative and weak. This reveals that pupils' gender has no significant predictive power on their mathematics anxiety. The null hypothesis which predicted no predictive power of gender on mathematics anxiety of primary school pupils was further subjected to ANOVA statistical analysis.

Hypothesis 2

There is no predictive power of gender on mathematics anxiety of primary school pupils.

Table 4: Analysis of variance (ANOVA) analysis of the pupils' gender on mathematics anxiety

Gender	t-value	Pearson r	Better Value	Sig. (2-tailed)	Decision
Mathematics Anxiety	-.381	.020 ^a	.94530	.000	Accepted

To further verify this assertion, the corresponding hypothesis of no significant predictive power was subjected to analysis of variance (ANOVA). The better value of estimate which is the standard deviation of the actual value of the scores on mathematics anxiety about the ANOVA line of estimated values of the predictors is shown to be .94. The relationship between pupils' gender on

their mathematics anxiety is negative and weak. This was shown in the correlation between observed value predictor variable (gender) and the criterion variable which is mathematics anxiety, the Pearson's Correlation coefficient (r) is $.020^a$ which is significant at $.000$, this was below the 0.05 probability level at which the null hypothesis was tested. The result revealed a significant predictive power and relationship of pupils' gender on pupils' mathematics anxiety. The null hypothesis of no significant predictive power of gender on pupils' mathematics anxiety is therefore accepted.

7. Discussion

Inspired by the need to investigate the pupils' academic procrastination and the relationship with mathematics anxiety, the purpose of this study was to determine the predictive power of academic procrastination on mathematics anxiety of primary school level. The first research question ascertained the predictive power of academic procrastination on mathematics anxiety. In other words, the result indicates that there is a high predictive power of pupils' academic procrastination on their mathematics anxiety in Nsukka Local Government Education Authority in Enugu State, Nigeria. It was found that pupils' academic procrastination significantly predicts their mathematics anxiety. In affirmation to the above assertion, Akinsola, Tella and Tella (2007) explained that students who procrastinate resist completing assignment and other deadlines that create tension and anxiety. Moreso, Olubusayo (2010) demonstrates that procrastinators may also be emotionally overwhelmed and anxious, having less need for cognitive complexity and are more likely to attribute success to external and unstable factors (Olubusayo, 2010). Popoola (2005) further maintained that procrastination is a dispositional trait which has cognitive, behavioural and emotional components which makes an individual postpone doing things that make him or her anxious and apprehensive. This is supported by Hopper (2005) and Phillips (2000) who discovered that mathematics to some students is often associated with pain and frustration and this may account for the reason why they procrastinate in studying mathematics. This assertion is also supported by Solomon and Rothblum (1984) who posit that people tend to avoid tasks which they find unpleasant and engage in activities which are more rewarding especially with short-term over long term gains. Also, Akinsola, Tella and Tella (2007) observe that many students refer to mathematics as being difficult and as asserted by the learning common fact series, procrastination often results when a task seems difficult, unpleasant or overpowering. This is especially true of adolescents who often prefer pleasurable times to being constrained to do something.

The result shows that pupils' gender does not significantly predict their mathematics anxiety. The issue of being male or female has no significant prediction on pupils' mathematics anxiety. This was affirmed by Campbell, Reese, O'Sullivan, & Dossey (1996) that boys and girls have similar mathematics and science proficiency scores on tests at the age of 9. Furthermore, it was found that there was no measurable difference in the math proficiency of 13-year-old boys and girls. Contrarily, Alexander & Martray (1989) found that gender differences in mathematics anxiety have been extensively studied and the results are inconsistent, with a number of studies reporting that females have higher levels of mathematics anxiety than males and others not confirming significant differences. Baloglu and Kocak (2006), controlling for mathematics experience, found that gender effects of mathematics anxiety varied with the context. The study also aimed to look at gender differences in mathematics performance and attitudes. Most current studies suggest that females do not perform lower in mathematics than males, but that they do tend to rate themselves lower, and to experience more anxiety (Dowker, Bennett & Smith, 2012).

8. Recommendation

- Lessons must be presented in a variety of ways that will help pupils perceive mathematics as fun and pleasant, this will make the joy of mathematics could remain with them throughout the rest of their lives, which will ensure the development of a sustainable educational system.
- Teachers should be able to detect the victims of mathematics anxiety as they experience it in myriad ways that range from an uneasy feeling to difficulty breathing while attempting to complete mathematical tasks such as physiological and psychological symptoms like increased heart rate, clammy hands, upset stomach, and lightheadedness - physiological symptoms and feelings of helplessness, worry, disgrace, and not being able to cope - psychological symptoms.

➤ Teachers, parents psychologists and counselors should help to inculcate and strengthen confidence, competence, effective use of time, good organization and the likes which cannot be over-emphasized to avoid procrastination among these male and female pupils.

➤ The project will raise awareness of mathematics anxiety among teachers, parents and psychologists to identify the triggers of mathematics anxiety and to understand everyday experience and coping mechanisms in mathematics anxiety and the interaction of anxiety and performance. This information will be useful in determining how mathematics anxiety can be avoided, how existing mathematics anxiety can be alleviated and to find out the variations of mathematics anxiety between male and female pupils and to devise means of helping both male and female pupils equally to get rid of this problem.

➤ The behaviours must create a real handicap in at least two areas of a person's life, like home and the classroom, or the classroom and on the playground. Thus, an individual who exhibits some symptoms but whose academic performance or social life are not impaired would not be diagnosed with ADHD.

Conclusively, mathematics procrastination is very real and is experienced by thousands of people. Much of this happens to students due to their hatred for mathematics. Today, the needs of society require a greater need for mathematics. Mathematics must be looked upon in a positive light to reduce academic procrastination which could most likely result in mathematics anxiety. In this way, developing a sustainable educational system will be ensured.

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