

# **Academic Test Anxiety and Mathematics Performance of Senior Secondary School Students in Model Secondary School Maitama, Abuja, Nigeria**

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## **Abstract**

This study explored the relationship between academic test anxiety and Mathematics performance among senior secondary III (SS3) students in Model Secondary School (MSS) Maitama, Abuja. 100 students were selected through purposive random sampling from a population of 120 SS3 students. The study was a descriptive field survey and was guided by three hypotheses. The test anxiety questionnaire by Nist and Diehl (1990) and Mathematics achievement test jointly set by some teachers of mathematics were the instruments for data collection. Pearson Product Moment Correlation Statistical technique and the t-test were used as the statistical tools for data analysis. Findings from this research revealed an inverse relationship (negative correlation) between the test anxiety of students and their performance in mathematics, and no significant difference between the test anxiety scores of male and female students. There was a significant difference between the performance in mathematics of high-test anxiety students and low-test anxiety students. It was recommended among others that Continuous Professional Development (CPD), which equips teachers with the wherewithal to detect signs of anxiety and helps to reduce it should be encouraged.

**Keywords:** Academic Test anxiety, Performance, Mathematics, Relationship, Students.

## **1. Introduction**

The importance of mathematics as a subject cannot be overemphasized, and that is why Poor performance in it is seriously frowned at. According to Pi Day (2018), mathematics helps one to have better problem-solving skills, analytical thinking skills and better reasoning abilities. In a mathematically driven world, where every career involves a bit of mathematics, hardly can one exist meaningfully without the knowledge of mathematics. The Times of India (TOI, 2015) revealed that mathematics helps one to be methodical or systematic, making one's life to be orderly and prevents chaos. It also imparts the qualities of reasoning power, creativity, abstract or spatial thinking, critical thinking, problem-solving ability and even effective communication skills. Clements and Sarama (2009) revealed that mathematics appears to be a core component of learning and thinking. In other

words, it is very relevant in everyday life and links up other subjects like engineering, science, medicine, and computer.

These are probably the reasons for one to obtain a minimum of credit pass in Mathematics in Nigeria to secure admission in the universities. Even if one does not want to proceed to the university but wants to secure employment with his Senior Secondary School Certificate in Nigeria, the person discovers that most employers of labour give preference to those who have done well in mathematics; a pointer to the importance of mathematics as a subject that links up other subjects. Sa'ad, Adamu and Sadiq (2014) described it as a subject that has direct relationship with other subjects especially technical and science subjects, and which cuts across primary and secondary schools as a compulsory subject. Poor performance in mathematics, therefore, is a critical issue and can be associated with some factors such as test anxiety.

Test anxiety has been a worrisome issue in academic circles the world over. Most of the behaviours of learners have been observed to be affected by this emotional trait. Lenka and Kant (2012) opined that anxiety plays a vital role in human life, in that most individuals are victims of anxiety in different ways. Almost everyone sometimes experiences anxiety in diverse ways, but basically as an unpleasant emotion marked by worry, apprehension, dread and fear. It was probably for this reason that Swift, Cyhlarova, Goldie and O'Sullivan (2014) saw anxiety as a natural human state and a vital part of life which all humans experience. Different authorities have variously defined the concept of anxiety. Denwigwe and Ajah (2017) citing Al-Khasawneh (2016) defined anxiety as a state of apprehension and fear, resulting from predicting a threatening situation or event. It is an excessive distress that interferes with performance in an examination (Cherry, 2019). Cherry (2020) stated that while many people experience some degree of stress and anxiety before and during examinations, test anxiety can impair learning and hurt test performance. Anxiety is a displeasing feeling of uneasiness, nervousness, apprehension, fear, concern or worry (Barlow 2002, Karatas, Alci and Aydin 2013, Lenka and Kent 2012 cited by Mustapha, Melonashi, Shkemi, Besim and Fanaj, 2015). Corey (2015) described it as a state of tension that motivates one to do something. In other words, anxiety is the result of a person's effort to survive and to maintain and assert his being (Denwigwe and Ajah, 2017).

Corey (2015) asserted that anxiety could be normal (i.e. objective) and neurotic. Normal or objective anxiety refers to how a person responds realistically when he feels that there is danger in his environment. This can also be described as an appropriate response to an event that one is facing. Neurotic anxiety on the other hand, is the type of anxiety which occurs when individuals experience an unconscious conflict within them but cannot explain the reason for their anxiety. When anxiety is too much, it can cause ill-health or some anxiety disorders like panic attacks, phobias and obsessional behaviours (Swift, Cyhlarova, Goldie and O'Sullivan (2014)). It is worthy of note that normal anxiety does not have to be repressed and can serve as a motivation to change but neurotic anxiety must be curtailed because it is basically out of proportion to its provoking situation. Anxiety according to Swift, Cyhlarova, Goldie and O'Sullivan (2014) helps one to identify and respond to danger in fight or flight mode and can motivate one to deal with difficult challenges.

Anxiety is a prominent feature among secondary school students especially while preparing for examination or during examination. Gotter (2017) noted that test anxiety comes with physical, cognitive and emotional symptoms. These symptoms include excessive sweating, nausea, vomiting or diarrhoea, stomach pain, rapid heartbeat, shortness of breath, and headache. Faintness, self-doubt, fear, stress, hopelessness, inadequacy, anger, lack of concentration, jumbled thoughts and struggling to choose between two answers are symptoms of anxiety. It is very common for some students to fall sick during tests or examinations, some lose their appetites, and some sweat copiously on their palms. Certain learners can experience dryness of the mouth, stomach upset, and some cannot sleep while some others become very nervous, especially when they are not prepared for their examinations. It is not out of place for somebody to experience unpreparedness for his or her examinations.

Several factors can make it possible for students to experience unpreparedness for a test or examination. Such factors include poor time management, lack of study skills, insufficient preparation with test material, and teacher factor, etc. Heath (2012) stated that during the actual test, students will 'blank' out mentally, be unfocused and feel like there is not enough time. Sometimes too, when a student has prepared well enough for a test, he or she experiences anxiety which manifests through symptoms that could be physical, cognitive or behavioural, before, during and after a test. Dobson (2012) citing Bensoussan (2012) stated that even students who do well in class work and homework can suffer from test anxiety and so do poorly on tests; and also observed that students of all academic achievement levels suffer from academic test anxiety.

The exhibition of a little bit of anxiety among students who are preparing for test or examination is not a problem as such because it pushes them to prepare better (Denwigwe and Ajah, 2017). Mental Health Foundation (2014) revealed that the right amount of anxiety can help one to perform better and stimulate action and creativity. Donnelly (2009) commented that a minimum level of anxiety can gainfully motivate people, helping them to be responsible and to live sustainably and prosperously. If the anxiety, however, continues beyond a certain normal level, especially among students, it can affect performance in their examinations and is therefore, viewed as a problem. Akanbi (2013) believed that some degree of anxiety is required to succeed academically but as anxiety levels increase, it becomes disruptive and weakens academic performance. Cherry (2020) observed that students have the skills and knowledge to do very well in testing situations, but their excessive anxiety impairs their performance.

Referring specifically to mathematics, which is one of the compulsory school subjects in primary and secondary schools in Nigeria, Blazer (2011) asserted that the most prominent of the test performance anxieties suffered by individuals and connected to a knowledge domain in educational setting is mathematics anxiety. Luttenberger, Wimmer and Paechter (2018) claimed that math-anxious individuals experience increased levels of anxiety in math-related situations. Cognitively, mathematics anxiety compromises the functioning of working memory (Luttenberger et al 2018, citing Cassady and Johnson, 2002). Blazer (2011) cited by Luttenberger et al (2018) concluded that physiologically, symptoms of mathematics anxiety include increased heart rate, clamming hands, upset stomach and light headedness. Papousek, Rugger, Macher, et al (2012) cited by Luttenberger et al (2018) asserted that emotionally, individuals suffer from feelings of tension, apprehension, nervousness and worry due to mathematics anxiety. Luttenberger et al (2018) explained that environmental factors such as teachers' and parents' attitudes towards their students' and children's ability in mathematics, societal stereotypes, for example, on females' mathematics abilities or personal factors such as traits or gender can lead to mathematics anxiety.

Issues pertaining to anxiety often come up during discussions of performance in tests or examinations. The importance of assessing children to determine their level of performance vis a viz their anxiety level therefore comes to mind. Ohanaka and Unuaje (2015) opined that academic assessment in the form of scores and grades earned in class work, assignments, tests, and examinations has over the years played an important role as a means of evaluating learners' performance. The importance of students' academic performance especially in mathematics cannot be overemphasized. It reveals the potentials and the capabilities that are bottled up in the learners and so it is necessary to find out if it is in anyway related to anxiety.

Some studies have shown that anxiety leads to poor academic performance and underachievement, poor engagement in class, and school refusal. Owen, Stevenson, Hadwin, and Norgate (2012) stated that test anxiety can negatively affect academic performance, as students who report higher levels of test anxiety show lower levels of academic achievement. Lynehem (2009) opined that students of high test anxiety level are more likely to be in the bottom of the class, and score lower than peers on measures of IQ and achievement tests (example basic skills); they are motivated to avoid engaging in tasks that require communication or that involve potential peer or teacher evaluation and consequently miss the benefit of interactive learning experiences. Dobson (2012) stated that when one is worried, the capacity for other mental tasks gets depleted and so does the capacity for

concentration on other academic problems and problem solving. Huberty (2009) found that as a student's academic performance suffers, the anxiety level related to certain academic tasks increases. According to Davis (2004) test anxiety decreases attention span, memory and concentration and then leads to low academic performance. Eysenck (2001) cited by Yousefi et al (2010) found that academic test anxiety creates irrelevant thoughts, preoccupations and decreased attention and concentration, and thus leads to academic difficulties. Needham (2006) stated that when attention and concentration are disturbed (probably by anxiety), memory is disrupted, and the consequence is low academic achievement. A study on relationship between test anxiety and academic achievement among Iranian adolescents by Yousefi et al (2010) revealed a significant negative relationship between test anxiety scores and students' achievement scores. The study concluded that test anxiety is one of the factors responsible for students' under-achievement and low performance but can be managed by appropriate training of students in dealing with factors causing test anxiety. Yousefi et al (2010) also reported an agreement between their study and those of Keoghi et al (2004), and Chapell et al (2005), which revealed a relationship between the level of test anxiety and academic achievement. Students with low test anxiety had higher academic achievement than those with moderate and higher test anxiety, and those with moderate test anxiety had higher academic achievement than those with higher test anxiety.

According to Wu, Amin, Barth, Malcarne, and Meron, (2012), Math anxiety has a detrimental impact on math achievement regardless of whether children have an anxiety related to numbers or to the situational and social experience of doing math. The findings by Lim (2015) revealed a positive correlation instead of a negative correlation between maths test anxiety and numerical anxiety with students' mathematics achievement. Findings by Jain (2012) and Devine, Fawcett, Szucs and Dowker (2012) showed that there was no significant difference between the academic test anxiety of boys and girls. Devine, Fawcett, Szucs and Dowker (2012) also found from their study that female students had higher test anxiety than male students, although their study was in English Language. Hamzah's study (2007) showed that school students with higher level of academic anxiety have lower academic performance while those with lower anxiety levels have higher academic performance. Hill, Mammarella, Devine, Caviola, Passolungi, and Szucs (2015) and Carey, Hill, Devine, and Szucs (2016) in their studies revealed that students who score high on measures of test anxiety, often score lower on tests than do students with low anxiety scores.

Based on the foregoing, Mathematics was selected for investigation in this study. Several studies have been done on academic test anxiety and general school performance, but there is a dearth of studies on academic test anxiety and performance in mathematics and especially with respect to gender dimensions in Nigeria. This study, therefore, aims at filling this gap. Also, a downward trend in Mathematics performance of students in public examinations is highly observable, as revealed by Sa'ad, Adamu and Sadiq (2014), who claimed that in spite of the importance attached to mathematics in Nigerian education system, poor performance is recorded in public examinations in recent times. Academic test anxiety could be a reason for this. Against this background therefore, this study set to investigate the relationship between Academic test anxiety and Mathematics performance of senior secondary school students in Model Secondary School Abuja, Nigeria.

The purpose of this study was to investigate academic test anxiety and performance in mathematics by senior secondary students and to suggest ways of encouraging healthy levels of academic test anxiety. The research aimed at throwing light on academic test anxiety and mathematics performance, explaining the variables that provoke anxiety in mathematics tests, stating the educational impact of anxiety during mathematics test and possible means of preventing or alleviating it. The study is significant in that findings from it may provide useful information to students, teachers, and curriculum planners on academic test anxiety and how it relates to performance of students in mathematics. Counsellors may find it useful as they guide students on how to perform better considering their diverse needs and background.

## Hypotheses for the Study

The following hypotheses were formulated to guide this investigation:

- 1) There is no significant relationship between students' academic test anxiety scores and their mathematics test scores.
- 2) There is no significant difference between the academic test anxiety scores of male and female students.
- 3) There is no significant difference in mathematics test scores between students with high academic test anxiety and those with low academic test anxiety.

## Methodology

The study is a descriptive field survey, with a population of one hundred and twenty SS3 students in Model Secondary School Maitama, Abuja, Nigeria. A sample of one hundred students (50 boys and 50 girls) was purposively selected for the study. The test anxiety questionnaire by Nist and Diehl (1990) was used to collect data on the academic test anxiety level of students. The questionnaire has ten simple questions, with a 5-point Likert-like scale comprising Never (1), Rarely (2), Sometimes (3), Often (4) Always (5). Each Participant's scores on all statements were added up. Denwigwe and Ajah (2017) citing Nist and Diehl (1990) stated that the scores range from 10 to 50; a score of (10-19) shows that one does not suffer from test anxiety while a person with an extremely low score (close to 10), may need a little more anxiety to be healthy, focused and to get his blood flowing during exams. Scores of 20 – 35 indicate that, although one exhibits some of the characteristics of test anxiety, the level of stress and tension is probably healthy (LSU Health, 2020). Scores of 35 and above reveal an unhealthy level of anxiety.

In this study therefore, anxiety scores of 10 to 35 were taken as low while scores above 35 were taken as high for convenience. The second instrument for data collection was a Mathematics test jointly designed by some experienced Mathematics teachers which provided data on students' ability in mathematics, an index for academic performance. The mathematics test consisted of two sections A and B. Section A indicated demographic information such as age and sex, while the ten items in section B tested the students' mathematical performance or ability. On the reliability of the Nist and Diehl's anxiety questionnaire, Heath (2012) stated that many colleges have used it on their students and found it valid and reliable. Denwigwe and Ajah (2017) cited Banka & Hyland (2016) to have used the questionnaire and found it very reliable, with a Cronbach's alpha value of 0.86. To establish the reliability of the mathematics test jointly designed by some experienced mathematics teachers, a test-retest was done using Pearson Product Moment Coefficient which gave a value of 0.88, showing that the instrument is reliable.

The Academic Test Anxiety questionnaires and the mathematics test were jointly administered on the respondents by the researchers and the experienced Mathematics teachers who also did the marking. Numbers were assigned to the respondents instead of making them use their names to avoid faking. The data collected was analysed using Pearson Product Moment correlation and t-test statistics. The analysis of data was done in line with the hypotheses for the study.

## Data Analysis/ Findings

### Hypothesis One

There is no significant relationship between students' academic test anxiety scores and their mathematics test scores. Pearson Product Moment Correlation statistical technique was employed to test for the hypothesis. The result is as presented in table 1.

**Table1:** Pearson Product moment correlation analysis of relationship between students’ academic test anxiety scores and their mathematics test scores. (N = 100)

Variable	$\frac{\sum X}{\sum Y}$	$\frac{\sum X^2}{\sum Y^2}$	$\sum xy$	r-cal.	p-val
Mathematics scores	470.623	46591.710	112569	-0.931*	.000
Test anxiety scores	- 232.704	- 23037.730			

\*Result significant at P<.05, critical r = 0.195, df = 98.

Result from table 1 revealed that the calculated r – value of -0.931 was greater than the critical r-value of 0.195 at .05 alpha level of significance. With this result, the null hypothesis one was rejected. This means that there is significantly high negative relationship or inverse relationship between students’ academic test anxiety scores and their mathematics test scores. In other words, as the test anxiety score increases, the mathematics performance scores decreases.

**Hypothesis 2**

There is no significant difference between the academic test anxiety scores of male and female students. Independent t-test analysis was used to test this hypothesis. The result of this The Independent t-test analysis used to test this hypothesis is presented in table 2.

**Table2:** Independent t-test result for the difference between academic test anxiety scores of male and female students

Gender	N	$\bar{X}$	SD	T-value
Male	50	31.3200	11.89828	
Female	50	30.7000	11.25448	.268

Not Significant (p< .05), df = 98, critical t-value = 1.97

The result of analysis in table 2 shows that the calculated t- value of .268 was less than the critical t- value of 1.97 at 0.05 level of significance with 98 degrees of freedom. This means that there is no significant difference between the academic anxiety scores of male and female students at 0.05 level of significance. Therefore, the null hypothesis which says that there is no significant difference between the academic test anxiety scores of male and female students is accepted. The mean score for academic test anxiety for males is 31.32 with a standard deviation of 11.89 while that of the female students is 30.7 with a standard deviation of 11.25. This shows that even though there is no significant difference, the male students scored slightly higher in academic test anxiety than the females.

**Hypothesis 3**

There is no significant difference in mathematics test scores between students with high academic test anxiety and those with low academic test anxiety. The result for the testing of this hypothesis is presented in table 3.

**Table3:** Independent t-test result for the difference in mathematics test scores between students with high academic test anxiety and those with low academic test anxiety

Test Anxiety Scores	N	$\bar{X}$	SD	T-value
High scores	36	18.9722	5.73952	
Low scores	64	57.6563	13.18997	16.7

\*Significant (P>.05); Critical t = 1.97; df 98

## Discussion

The result in table 1 showed a significant negative correlation between the academic test anxiety scores of the students and their mathematics scores. It means that students' mathematics test scores reduce as their academic test anxiety levels increase. As a result, the null hypothesis 1 which stated that there is no significant relationship between the academic test anxiety scores and mathematics test scores was rejected while the alternative was accepted. This result is in line with a study on relationship between test anxiety and academic achievement by Yousefi (2010) which revealed a significant negative relationship between test anxiety scores and students' achievement scores among Iranian adolescents. The study concluded that test anxiety is one of the factors responsible for students' under-achievement and low performance but can be managed by appropriate training of students in dealing with factors causing test anxiety. It also agrees with Wu, Amin, Barth, Malcarne, and Meron, (2012), who revealed that Math anxiety has a detrimental impact on math achievement regardless of whether children have an anxiety related to numbers or to the situational and social experience of doing math. The findings by Lim (2015) which revealed a positive correlation instead of a negative correlation between maths test anxiety and numerical anxiety with students' mathematics achievement, is not however in total agreement with the findings of this study.

The results in table 2 revealed that there was no significant difference between the academic test anxiety scores of male and female students, hence the acceptance of null hypothesis 2. This is in line with the findings of Jain (2012), and Devine, Fawcett, Szucs and Dowker (2012) that there was no significant difference between the academic test anxiety of boys and girls. However, the mean scores showed that the male students had slightly higher test anxiety than females and this disagrees with Devine, Fawcett, Szucs and Dowker (2012) who found that female students had higher test anxiety than male students, although their study was in English Language.

The result in table 3 showed a significant difference between the mathematics scores of high and low-test anxiety students. This shows that the performance of high academic anxiety students differs from the performance of those with lower academic anxiety. From the mean scores, it was deduced that those with higher academic test anxiety scored less in the mathematics test while those with low academic test anxiety scored higher in the mathematics test. This agrees with the findings of Hamzah (2007) that school students with higher level of academic anxiety have lower academic performance while those with lower anxiety levels have higher academic performance. Hill, Mammarella, Devine, Caviola, Passolungi, and Szucs (2015) and Carey, Hill, Devine, and Szucs (2016) revealed that students who score high on measures of test anxiety, often score lower on tests than do students with low anxiety scores.

## Conclusion

This study concluded that there is a significant negative correlation between the academic test anxiety scores of the students and their mathematics scores, meaning that mathematics test scores reduce as students' academic anxiety levels increase. It also concluded that the academic test anxiety scores of male and female students do not significantly differ, but that the test anxiety scores of males are higher than the females. Mathematics test scores of high and low anxiety students differ. The mean scores revealed that the students with low academic test anxiety had higher mathematics scores than those with high academic test anxiety. This means that students with low academic test anxiety perform better than those with higher academic test anxiety. Academic achievements of students, therefore, can be affected by anxiety. The academic achievement of youths of every nation goes a long way to impact on its growth and development. High academic achievements promote sustainable development, therefore, issues pertaining to academic achievement should be viewed seriously.

## Recommendations

The following recommendations are proffered with the mind-set that too much of anxiety can negatively affect academic performance:

- i. Continuous Professional Development (CPD) which equips teachers with the wherewithal to detect signs of anxiety and to reduce it should be encouraged.
- ii. Whenever students who manifest extreme levels of anxiety are identified, they should be sent to professional Guidance Counsellors to receive behaviour therapy.
- iii. It is necessary for teachers to observe students at work, to notice any signs of anxiety so that they can be given support and encouragement. This is possible by initiating a dialogue on anxiety through which they acknowledge their feelings and encourage their efforts.
- iv. Non-anxious behaviours should be rewarded while anxious behaviours should be redirected. For instance, if a child is complaining that he finds mathematics tasks difficult and dodges the mathematics class, the teacher can redirect his behaviour by giving him easier and more interesting tasks in mathematics and then gradually introduce him to the more tasking ones.
- v. Programmes like 'study technology' should be introduced to promote healthy anxiety levels.
- vi. Students should be taught test preparation skills which help to boost their confidence.

## References

- [1] Akanbi, S.T. (2013). Comparisons of test anxiety level of senior secondary school students across gender, year of study, school type and parental educational background. *IFE Psychologia: An International Journal*, 21(1), 40-50.
- [2] Al-Khasawneh (2016). Investigating foreign language learning anxiety: A case of Saudi undergraduate EFL learners. *J. of Language and Linguistic Studies* 12(1), 137-148.
- [3] Barlow, D. H. (2002). Unravelling the mysteries of anxiety and its disorders from the perspective of emotion theory. *American Psychologist*, 55, 1247-1263.
- [4] Banka, P. & Hyland, J.M. (2016). The role of ISPPC social support on perceived stress, test anxiety, and self-esteem among post primary school students. *Psychology and Society* 8(1) 75-84.
- [5] Bensoussan, M. (2012). Alleviating test anxiety for students of advanced reading comprehension. *RELC. Journal* 43(2), 203-216. doi.10.1177/0033688212449511.
- [6] Blazer, C. (2011). Strategies for reducing mathematics anxiety (Information Capsule). Retrieved from <https://eric.ed.gov/?id=Ed536509> on February 19, 2018.
- [7] Cassidy, J.C., & Johnson, R. E. (2002). Cognition, test anxiety and academic performance. *Contemporary Education Psychology* 27(2), 270-295.
- [8] Chapell, M.S., Blanding, Z.B., Silverstein, M.E. (2005). Test anxiety and academic achievement in undergraduate and graduate students. *Journal of Education Psychology*, 97(2), 268-278.
- [9] Cherry, K. (2020). What is test anxiety. Retrieved from <https://www.verywellmind.com> on March 28, 2020.
- [10] Clements D.H., & Sarama, J. (2009). *Learning and teaching early math: The learning trajectories approach*. New York: Routledge.
- [11] Carey, E., Hill, F., Devine, A., & Szucs, D. (2016). The chicken or the egg? The direction of the relationship between mathematics anxiety and mathematics performance. *Frontiers in Psychology*. Retrieved from <https://doi/10.3389/fpsyg.2015.01987>.
- [12] Corey, G. (2015). *Theory and Practice of Counselling and Psychotherapy*. India: Cengage Learning.140- 141.



- [13] Davis, R.E. (2004). Test anxiety susceptibility to destruction and examination performance. *Journal of Anxiety, Stress and Coping*, 17(3), 241-252.
- [14] Denwigwe, C.P., & Ajah, M.O. (2017). Influence of Academic test anxiety on the reading comprehension of students of Government Secondary School Gwarinpa, Abuja, Federal Capital Territory.
- [15] Devine, A., Fawcett, K., Szucs, D., & Dowker, A. (2012). Gender differences in Mathematics anxiety and the relation to mathematics performance while controlling for test anxiety. *Journal of Behavioural and Brain Functions*, 8. 10.1186/1744-9081-8-33.
- [16] Dobson, C. (2012). Effects of academic anxiety on the performance of students with or without learning disabilities and how students can cope with anxiety at school. Retrieved from [nmu.edu/education/sites/DrupalEducation/files/UserFiles/Dobson\\_Cassie\\_MP.pdf](http://nmu.edu/education/sites/DrupalEducation/files/UserFiles/Dobson_Cassie_MP.pdf). on August 23, 2016.
- [17] Donnelly, R. (2009). Embedding interaction within a blend of learner centric pedagogy and technology. *World Journal on Educational Technology 1 (1)*, 6-29.
- [18] Eysenck, M.W. (2001). *Principles of Cognitive Psychology*. Hove, East Sussex: Psychology Press
- [19] Gotter, A. (2017). What is text anxiety? Retrieved from <https://www.healthline.com> on September 9, 2019.
- [20] Hamza, M.H. (2007). Language anxiety among first year Malay students of the International Islamic College: An investigation of L2 skills, sources of anxiety and L2 performance. A Master dissertation in Human Science, IIUM, Malaysia.
- [21] Heath, A. (2012). Tips for overcoming test anxiety in college. Edited by Finn, W. Retrieved on August 19, 2016 from [www.brighthub.com/education](http://www.brighthub.com/education).
- [22] Hill, F., Mammarella, I.C. Devine, A., Caviola, S., Passolungi, M. C., & Szucs, D. (2015). *Learning and individual differences*. Retrieved from <https://doi.org/10.101/j.lindif.2016.02.0066>
- [23] Huberty, T.J. (2009). Test and performance anxiety. *Principal Leadership*' 10, 12-16. Retrieved from <http://www.naspoline.org> on August 23, 2016.
- [24] Jain, A. (2012). Effect of academic anxiety and intelligence on the academic achievement of the elementary level. *Asian Journal of Multidimensional Research*, 1 (4) 90-95.
- [25] Karates, H., Alci, B., & Aydin, H. (2013). Correlation among high school senior students' test anxiety, academic performance and points of university entrance examination. *Educational Research and Reviews*. 8(13), 919-926.
- [26] Keoghi, E., Bond, F.W., French, C.C., Richards, A., & Davis, R.E. (2004). Test anxiety, susceptibility to destruction and examination performance. *Journal of Anxiety, Stress and Coping* 17(3), 241-252.
- [27] Lenka, S. K., & Kant, R. (2012). A study of academic anxiety of special need's children in special reference to hearing impaired and learning disabled. *International Journal of Multidisciplinary Research*, 2 (2), 64-72.
- [28] Lim, E. (2015). The influence of pre-university students' maths test anxiety and numerical anxiety on math achievement. *International Education Studies* 8(11), 162. DoI:10.5539/iesiv8n11p162.
- [29] LSU Health, (2020). Test anxiety questionnaire. Retrieved from [nursing.lsuhs.edu/Apps/AcademicSuccessProgram/Anxiety/Questionnaire](http://nursing.lsuhs.edu/Apps/AcademicSuccessProgram/Anxiety/Questionnaire) on May 2, 2020.
- [30] Lynehem, H. (2009). The impact of anxiety on students' performance. Retrieved from <http://www.aisnsw.edu.au>> Documents on August 23, 2016.
- [31] Luttenberger, S., Wimmer, S., Paechter, M. (2018). Spotlight on mathematics anxiety. *Journal of Psychological Research and Behaviour Management*, 11, 311-322.
- [32] Needham, B.L. (2006). Gender differences in the consequences of depressive symptomatology for educational attainment, social support and health risk behavior during the transition from adolescence to young adulthood; unpublished Ph.D. thesis, University of Texas.

- [33] Ohanaka, B.J., & Unuaje, S.E. (2015). Influence of study habits on academic performance of undergraduates in education in university of Benin. *The Counsellor*, 34(1), 114.
- [34] Owen, S.M., Stevenson, J., Hadwin, J.A., & Norgate, R. (2012). Anxiety and depression in academic performance: an exploration of the mediating factors of worry and working memory. *School of Psychology International*, 33,433-449.
- [35] Mental Health Foundation (2014). Living with anxiety: understanding the role and impact of anxiety in our lives. Retrieved from [www.mentalhealth.org.nz/assets/A-Z/Downloads/Living-with-anxiety-report-MHF-UK-2014-pdf](http://www.mentalhealth.org.nz/assets/A-Z/Downloads/Living-with-anxiety-report-MHF-UK-2014-pdf) on May 2, 2020.
- [36] Mustafa,S., Melonashi, E., Shkemi, F.,Besim, K.,& Fanaj,N. (2015). Anxiety and self-esteem among university students: comparism between Albania and Kosovo. Retrieved from [core.ac.uk/download/pdf/81984946](http://core.ac.uk/download/pdf/81984946) on May 1, 2020.
- [37] Papousek, I., Ruggeri, K., Macher, D., et al (2012). Psychometric evaluation and experimental validation of the statistics anxiety rating scale. *Journal of Personality Assessment*, 94(1),82-91.
- [38] Pi Day (2018). 10 reasons why math is important in life (guide+ examples). Retrieved from <https://www.piday.org>>10 reasons on August 28, 2019.
- [39] Reilly, R.R., & Lewis, E.L. (1991). *Educational Psychological*. New York: Laural Tanner Macmillan Company Inc.
- [40] Sa'ad, T.U.,Adamu, A.,Sadiq, A.M. (2014).The causes of poor performance in mathematics amongb public senior secondary school students in Azare Metropolis of Bauchi State Nigeria, *IOSR Journal of Research and Method in Education* 4(6), 32-40.
- [41] Times of India (2015). The importance of math on everyday life. Retrieved from <https://m.timesofindia.com>>Guwahati on August 28, 2019.
- [42] Wu, S., Amin, H., Barth, M., Malcarne, V., & Menon, V. (2012). Math anxiety in second and third graders and its relation to math achievement. *Frontiers in Psychology* 3, 162.Retrieved from [ncbi.nlm.nih.gov/PMC/articles/PMC336914/](http://ncbi.nlm.nih.gov/PMC/articles/PMC336914/)
- [43] Yousefi, F., Talib, M.A.,Mansur, M.B.,Juhari, R.B.,& Redzoan, M. (2010). The relationship between test anxiety and academic achievement among Iranian adolescents. *Asian Social Science* 6(5), 2010.