Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.7, No.15, 2016

Mathematics Anxiety among Ghanaian Students: A Case Study of Students of Kinbu Senior High / Technical School, Accra and Hermann-Gmeiner SOS Junior High School, Tema

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Abstract
The aim of this was to find out the reason for low performance in West African Examinations Council final examination in Core Mathematics. The exploratory research design was used for the study. A population of two hundred (200) students; 100 females and males in a breakdown of 50 males and 50 females from SHS and 50 males and 50 females from JHS was used. Richard Quinn's Mathematics Anxiety Rating Scale with a reliability coefficient of 0.90 (p=<.001) and validity found to be r=.92 (p=<.001) was used for data collection .The statistical tool used was the independent T-test comparisons. Results revealed that, mathematics anxiety exists among students in a frequency of 95 in the severe anxiety range of 75% - 95%. Out of 200 populations, 47.5% have severe anxiety for mathematics. It was also found that, significant difference exists between SHS female and SHS male. All other comparisons produce no significance. A study of the mean values showed that at the JHS level, the males have higher mathematics anxiety level than the females. At the SHS level, the males have higher mathematics anxiety levels than the females. Further, at the JHS level the males' mathematics anxiety is a little higher than the SHS males. Mathematics anxiety level increases from the JHS to the SHS level. The males have higher mathematics anxiety levels than the females. It is recommended that, Clinical Psychologists, School Counsellors, Guidance and Counselling personnel should urgently take students through systematic desensitization using anxiety hierarchy technique and behaviour therapy using anxiety-relief response to help students eliminate or reduce mathematics anxiety.

1. Introduction

Mathematics anxiety is a feeling of tension, apprehension or fear that interferes with mathematics performance, Ashcraft, 2002. Mathematics-anxious individuals have a strong tendency to avoid mathematics, which ultimately undercuts their mathematics competence and forecloses important career paths. Mathematics anxiety disrupts cognitive processing by compromising ongoing activity in working memory. (Ashcraft, 2002)
Ashcraft with Kirk, E. P. (2001), in a study revealed that people with high mathematics anxiety demonstrated smaller working memory span, when assessed with a computation-based span task. This reduced working memory capacity led to a pronounced increase in reaction time and errors when mental addition was performed concurrently with a memory load task. Overall, the results demonstrated that an individual difference variable, mathematics anxiety, affects on-line performance in math related tasks and that this affect a transitory disruption of working memory. They consider a possible mechanism underlying the effect, disruption of central executive processes and suggest that individual differences, variables like mathematics anxiety deserve greater empirical attention especially an assessment of working memory capacity and functioning.

The study of mathematics is important to nation building for many reasons; one of them being the training of professionals capable of managing the country's finances and economy. Another reason is the development of science and technology by equipping students with uniquely powerful ways to describe, analyze and change the world and help development in youth and in adults an attitude of discovery, problem solving and inductive and deductive reasoning.

The aim of teaching and studying mathematics is laudable but the trend in performance of Junior High School pupils and Senior High School students in mathematics at both Basic Education Certificate Examination (BECE) and West African Senior School Certificate Examination (WASSCE), is making the achievement of the aim of teaching and studying mathematics shaky and threatening. The following examples of performances in final examinations in mathematics are of serious concern.

Table 1: May/June WASSCE – Statistics on Performance in Core Mathematics: (2006 – 2013)

YEAR	TOTAL ENTRY	TOTAL SAT	NUMBER AND PERCENTAGE OBTAINING GRADE										FAIL
			CREDIT AND ABOVE GRADES						TOTAL CREDIT	PASS GRADES			
			A1	B2	B3	C4	C5	C6	A1 –C6	D7	E8	D7 – E8	F9
2006	122,604	121,696	3,117	2,169	8,055	5,213	4,892	14,736	38,182	19,052	21,869	40,921	41,367
	PERCENTAGE		2.5	1.7	6.6	4.2	4	12.1	31.3	15.6	17.9	33.50	33.9
2007	133,498	132,622	3,188	2,134	7,170	3,785	4,529	12,882	33,688	16,201	21,226	37,427	60,650
	PERCENTAGE		2.4	1.6	5.4	2.8	3.4	9.7	25.4	12.2	16	28.2	45.7
2008	136,526	135,766	3,563	2,414	7,920	3,055	4,905	13,680	35,537	16,812	22,267	39,079	60,809
	PERCENTAGE		2.6	1.7	5.8	2.2	3.6	10	26.1	12.3	16.4	28.7	44.7
2009	157,968	157,209	4,591	3,096	9,946	5,035	5,852	16,395	44,915	20,855	26,944	47,799	62,937
	PERCENTAGE		2.9	1.9	6.3	3.2	3.7	10.4	28.5	13.2	17.1	30.3	40
2011	148,267	147,651	5,184	3,955	14,807	6,018	9,669	24,479	64,112	22,060	25,921	47,981	34,486
	PERCENTAGE		3.5	2.6	10	4	6.5	16.5	43.4	14.9	17.5	32.4	23.3
2012	174,296	173,499	7,991	5,798	21,171	7,719	12,595	31,403	86,677	26,065	28,110	54,175	31,932
	PERCENTAGE		4.6	3.3	12.2	4.4	7.2	18	49.9	15	16.2	31.2	18.4
2013	405,356	402,794	6,757	6,304	31,683	14,360	23,970	65,493	148,567	63,145	77,912	141,057	113,170
	PERCENTAGE		1.6	1.5	7.8	3.5	5.9	16.2	36.8	15.6	19.3	34.9	28

The picture above on performance in core mathematics between 2006 and 2013 is very alarming. For instance, the total number of students with grade F9 in 2006 was 41, 367. This was more than the total number of students who passed in grades A1, B2, B3, C4, C5 and C6 put together (A1-C6); 38, 182. The same thing could be said of 2007, 2008, 2009 and 2013. The percentage performance on various grades earned by students also demonstrated low performance in Core mathematics. For instance, in 2006, candidates who got D7 –E8 were 40,921 which constituted 33.50% and F9 alone was 41,367 representing 33.9%. In 2007; D7 – E8 constituted 28.2 %(37,427) and F9 was 45.7% (60,650). In 2013, candidates who got grades D7 –E8 in core mathematics were 141,057 making 34.9% and F9 were 113,170 making 28.0%.

In 2014, 7,442 representing 3.0% candidates had F9 in Core mathematics. Figures for D7 and E8 excluded.

2. Statement of the Problem

The trend of low performances in mathematics at WASSCE is a case for concern. Implications are enormous as a good number of students may not gain admission to tertiary institutions with D7 in Core mathematics. Candidates who are able to rewrite and make a credit pass grade make it to the universities or other institutions to pursue a programme or career study of their choice. Others who do not rewrite may not go to tertiary institutions because of their inability to redeem the D7 in core mathematics. The overall effect on human resource base of the country in mathematics related programmes and general high level of educated individuals may soon be in short supply.

Something must be done about the low performances in core mathematics by students. What might be the motivation for this observed trend of consistent low performance in core mathematics? Is it existence of anxiety related to the study, learning and writing examination in core mathematics? If yes, what is the nature of the

anxiety; where and when the does the anxiety arouse? To find the answer to these questions is the reason for this study of mathematics anxiety.

3. Hypothesis

(1)There will be no significant level of mathematics anxiety among students of Junior High School (JHS) and Senior High School (SHS).
(2)There will be no significant difference of mathematics anxiety between students of Junior High School and Senior High School.
(3)Male and female students of Junior High School and Senior High School will have the same level of mathematics anxiety.

4. Research Design

The exploratory study research design was used because not much was known about the topic of the study in Ghana. This design was also chosen to help better understand the nature of the problem of mathematics anxiety since few studies might have been done in this area.

5. Target Population

The population of the study consisted of first year to third year male and female students from Kinbu Senior High/Technical School in Accra and first to third year people of Hermann-Gmeiner SOS Junior High School in Tema. The common features of the population are that, they are all day mixed gender schools. The two schools are known to attract high caliber of teachers for all subjects of study.

6. Sampling Technique

Random selection was performed for the 100 students (50males and50 females) from first year to third year in all departments of study at Kinbu Secondary/Technical Senior High School and100 pupils (50males and 50 females) from first to third year in SOS-JHS, Tema. A total of 200 students were randomly selected for the study.

7. The Instrument

The main instrument used for the study was Mathematics Anxiety rating scale by Richard Suinn. It is a 30 item self rating scale which may be administered either individually or to groups. Each item on the scale represents a situation which may arouse anxiety within a subject. The respondent is to decide on the degree of anxiety aroused using the dimension of “not at all”, “a little”, “a fair amount”, “much” or “very much”. A test-retest reliability coefficient for the MARS-S was calculated from the scores of college students retested one week later. The reliability coefficient of 0.90 ($p = <. 001$) compares quite favourably with the reliability for the longer MARS of 0.90 for the same period. An internal consistency reliability coefficient, Cronbach alpha was found to 0.96 for the longer MARS. In effect, this shows that the mathematics anxiety rating scale is highly reliable and indicates that the test items are heavily dominated by a single homogeneous factor, presumably mathematics anxiety. On validity, a college sample, correlations between the MARS-S and the longer MARS were found to be $r = 0.92$ ($p = <. 001$) for the original testing and 0.94 ($p = <. 001$) when both tests were re-administered one week later. MARS – S appears to be equivalent to the MARS; as further validation MARS-S scores were inversely correlated with grades in mathematics ($r= 41$, $p = <. 001$)

8. Procedure:

After permission was sought from the heads of the institutions used for the study, the Mathematics anxiety scales were given out to teachers to distribute to students and pupils selected for the study. The students and pupils were told not to write their names on the anxiety scale but indicate only their sex and form level. The mathematics anxiety scales were collected after one hour period allotted each respondent to read, understand and respond to the questions on the mathematics anxiety scale.

9. Scoring:

The Mathematics Anxiety Rating scale which determines the anxiety level for mathematics was scored by a 5 point likert scale of values 1 to 5, where 1 is the value for "not-at-all", 2 is "a little", 3 is a "fair amount", 4 is "much" and 5 is "very much". The responses for each point was multiplied with their respective values and the sum of all the products provided the raw total score for a mathematics anxiety.

10. Analysis of Data

The statistical tool used for data analysis was the independent T-test comparison. Two subject groups were used and results of the study were based on comparison of two different group means.

After calculating the anxiety values for each student group (JHS males, JHS females, SHS males and SHS females), the values were then ranked for each of the groups, thus from the lowest value to the highest value. Each group was then divided into two, 25 members for each group according to the ranking of anxiety values; that is from the lowest value to the highest value of mathematics anxiety. Each group was then divided into two, thus 25 members for each sub group for the main group according to the ranking of anxiety values. Thus for the first sub group of each main group the first 25 students according to the ranking were selected. Comparisons between all the sub groups were then tested for. First 25 members of each main group were tested among themselves and those for the second 25 members were also tested among themselves.

11. Results

The results of the study of mathematics anxiety among students are shown in the tables below;
Hypothesis one states that, "there will be no significant level of mathematics anxiety among students of JHS and SHS.''

The total number of students with math anxiety level score below 50 is given in table 2 below:

Table 2: First 25 Respondents After Ranking Scores

PARAMETER	MAXIMUM SCORE	MINIMUM SCORE	RANGE	COEFFICIENT VARIABLE
JHS Male	67.0	33.0	34.0	16.9
JHS Female	64.0	34.0	30.0	15.3
SHS Male	69.0	35.0	34.0	19.5
SHS Female	71.0	38.0	33.0	16.7

Studying the maximum and minimum scores, range score and coefficient variation for the first 25 rank members, results reveal that there is mathematics anxiety among students in JHS and SHS. A score of 60 and above in mathematics anxiety indicates a presence of mathematics anxiety. If students' anxiety scores were below 50 but had an average maximum score of over 60, then mathematics anxiety really exists among the two groups of students. Hypothesis one is therefore rejected.

Table 3: Second 25 Respondents After Ranking Scores

PARAMETER	MAXIMUM SCORE	MINIMUM SCORE	RANGE	COEFFICIENT VARIABLE
JHS Male	105.0	70.0	35.0	13.5
JHS Female	104.0	65.0	39.0	15.4
SHS Male	147.0	72.0	75.0	22.1
SHS Female	130.0	72.0	58.0	15.6

The maximum and minimum scores of the second 25 respondents from JHS and SHS whose anxiety score levels were over 50, indicated that a very high anxiety level exists among a number of students. The high level of mathematics anxiety could have implications for the low performances in core mathematics examinations.

Mathematics anxiety is a real phenomenal among students of Junior High School and Senior High School.

Hypothesis two states that, "there will be no significant difference in mathematics anxiety level between students in JHS and SHS.''

Results are shown in the tables 4 and 5 below;

Table 4: Anxiety Scores of Male and Female Students

PARAMETER	MAXIMUM SCORE	MINIMUM SCORE
JHS Male & Female	131.0	67.0
SHS Male & Female	140.0	73.0

Comparing the total maximum and minimum scores of the first 100 students, that is 25 respondents from each category of students, it was revealed that, mathematics anxiety is high among SHS students than JHS students.

Table 5: Anxiety Scores of Male and Female Students

PARAMETER	MAXIMUM SCORE	MINIMUM SCORE
JHS Male & Female	209.0	135.0
SHS Male & Female	277.0	144.0

Comparing the total maximum and minimum scores of the second 100 students whose total math anxiety score were above 50, it was revealed that, still the level of mathematics anxiety in SHS School is higher compared to mathematics anxiety of students in JHS. Therefore, by comparing the total maximum and minimum of scores of mathematics anxiety of students, hypothesis two is rejected meaning that, a significant difference of mathematics anxiety exists among students of JHS and SHS. The SHS students have high level of mathematics anxiety than the JHS students.

To test hypothesis three the T-test comparison was applied and the results are shown in table 6 below;

Hypothesis three “Male and female students of JHS and SHS will have the same level of mathematics anxiety.’’

Table 6: **Comparisons Among the 25 Respondents After Ranking Mathematics Anxiety**

PARAMETER	MEAN	MEAN DIFFERENCE	DEGREES OF DIFFERENCE	T - STATISTIC	F - PROBABILITY
JHS Female vrs. JHS male	80.4 83.4	2.960	48	0.88	0.384
JHS Female vrs. SHS Female	80.4 90.6	10.200	48	2.71	0.009*
JHS Female vrs. SHS Male	80.4 95.9	15.480	48	3.15	0.003*
JHS Male vrs. SHS Female	83.4 90.6	2.240	48	2.00	0.052
JHS Male vrs. SHS Male	83.4 95.9	12.52	48	2.60	0.013*
SHS Female vrs. SHS male	90.6 95.9	5.280	48	1.04	0.306

There is significant difference between JHS Female and SHS female and as well between JHS female and SHS male. Also between JHS male and SHS female, there is significant difference. All other comparisons produce no significance. A study of the mean values shows that, at the JHS level the males have higher mathematics anxiety levels than the females. At the SHS level the males have higher mean mathematics anxiety than the females. The study also shows that for the males, the SHS level anxiety is a higher than JHS. For the females, the SHS level is higher than the JHS. It is also found that the levels of mathematics anxiety increase from the JHS to the SHS

level. The males have higher levels than the females. The results from table 6 above meant that hypothesis three is ejected .Male and female students of JHS and SHS have different levels of mathematics anxiety.

Table 7: Comparisons Among Respondents After Ranking their Mathematics Anxiety.

PARAMETER	MEAN	MEAN DIFFERENCE	DEGREES OF DIFFERENCE	T - STATISTIC	F - PROBABILITY
JHS Female vrs. JHS male	52.5 52.7	0.160	48	0.07	0947
JHS Female vrs. SHS Female	52.5 57.6	5.120	48	2.03	0.048*
JHS Female vrs. SHS Male	52.5 51.9	0.600	48	0.23	0.818
JHS Male vrs. SHS Female	52.7 57.6	4.960	48	1.88	0.066
JHS Male vrs. SHS Male	52.7 51.9	0.760	48	0.28	0.780
SHS Female vrs. SHS male	57.6 51.9	5.720	48	2.04	0.047*

Considering the total number of students whose mathematics anxiety value was above 50, it was revealed that there is significant difference between JHS female and SHS female as well as between JHS female and SHS male. Also there is significant difference between JHS male and SHS female. A study of the mean values showed that at the JHS level the males have higher mathematics anxiety level than the females. At the SHS level the males have higher mean mathematics anxiety level than JHS. For the females the SHS ematics anxiety level is higher than the JHS. This result further confirms rejection of hypothesis three.

12. Discussion of Results

Findings from the study revealed that mathematics anxiety exists among students of Junior High school and Senior High School. Learning behaviour theories explain all phobia and external triggers as punishment. According to the theory, organisms learn to avoid noxious stimuli through some mediating mechanism called fear or anxiety (Strongman, 1995). Going by learning behaviour theories it means that, students see mathematics as a source of punishment and therefore would label it as noxious stimuli that must be avoided hence their poor performance at BECE and WASSCE final mathematics examinations?
AshGraft with Elizabeth, P Kirk (2001) showed that, people with high mathematics anxiety demonstrated smaller working memory span when assessed with a computation based span task. This reduced working memory capacity led to a pronounced increase in reaction time and errors when mental addition was performed concurrently with a memory load task. The mathematics anxiety found among the students might have been responsible for reduced working memory leading to a pronounced increase in reaction time and errors in mathematics which involves mental work hence the observed poor performance in mathematics over the years as shown in table 1.

At the Junior High School, there was no significant different between male and female students in mathematics anxiety. This is confirmed by Baenninger and Newcomb (1989) who did a longitudinal study where the mathematics and verbal abilities of males and females were tested on age 9-12 and results demonstrated no significant difference between them on both tasks. The implication is that, failure in mathematics at the Basic Education Certificate in Education (BECE) is not driven by gender inclination but an objective fear of mathematics.

However, at Senior High School, a significant difference exists between male and female students. SHS males have higher mathematics anxiety compared to females. This finding contradicts what Baenninger and Newcomb (1989) revealed that, at ages 15-18, verbal and spatial abilities were tested again and results demonstrated higher performance for males in spatial task but no difference in the verbal task. Baenninger and Newcomb concluded

that boys and girls perform equally well on mathematics achievement tests during elementary school, but girls begin to fall behind boys in later years. There might be a possible reason why male students of Senior High School have higher mathematics anxiety than females. Even SHS males' mathematics anxiety is higher than Junior High School males mathematics anxiety. A further study must be done to reveal what factors might be probably responsible for the high mathematics anxiety among boys at SHS. By implication, it is likely that boys may earn lower grades in mathematics at WASSCE compared to girls and therefore, there must also be grade analysis to see if it will be true that males perform poorly in core mathematics than females. However, girls too are also prune to a possible poor performance in core mathematics because they also have an appreciable level of mathematics anxiety.

To conclude, it has been found that, mathematics anxiety exists among students at both JHS and SHS levels. The level of mathematics anxiety among the students is within the range that calls for anxiety reduction strategies to help students overcome their fear of mathematics so that they improve on their grades in mathematics.

A credit pass (C6) in core mathematics is a compulsory admission requirements to tertiary institutions in Ghana. If it is assumed that, from 2006 to 2013 all the students earned credit pass (A1-C6) in all subjects and were qualified to be admitted in tertiary institutions especially the universities but had D7 or E8 and F9 in core mathematics, then total number of students who were not admitted in any of the universities in Ghana both public and private because of D7, E8 and F9 grades were **813,790.** This is shown in table 8 below;

Table 8: Students Who Did Not Gain Admission Into the Universities.

Year	**Pass grades in Mathematics D7, E8**	**Fail F9**	**Total Number of Students Not Admitted In Universities**
2006	40,921	41,367	82,288
2007	37,427	60,650	98,077
2008	39,079	60,809	99,88
2009	47,799	62,937	110,736
2011	47,981	34,486	82,467
2012	54,175	31,932	86,107
2013	141,057	113,170	254,227
Total	**408,439**	**405,351**	**813,790**

If a total number of 813,790 candidates did not gain admission into universities because of lower grade in core mathematics, then the situation is really alarming. This figure of 813,790 was the result of mathematics anxiety among Senior High School students. One may ask the reason for fear of mathematics and the low performance. In Ghana, the general low performance has been attributed to social factors by social commentators and policy spokespersons but these social factors have not been researched into. An article 'Confronting National Mathematics Phobia (modernghana.comnews, June 8, 2004) spoke of a nationwide aversion to the discipline where many students actively show dislike for mathematics and tend to avoid careers that involve advance varieties of mathematics with example being calculus and trigonometry.

It is possible that as students keep avoiding mathematics a lot of them might not be able to enter universities to pursue programmes that would lead to production of human resource capital in mathematics oriented courses such as engineering, economics, computer science, medicine, physics, to name a few. Until the low grade for performance in core mathematics is improved, the possibility is that a lot of vacuum many be created in the job market because inadequate personnel in the services of mathematics related programmes and courses will cause the Ghanaian economy to suffer eventually. Equally, administrative positions in Ghana could even suffer from inadequate number of skilled personnel owing to low competence in mathematics.

13. Therapeutic Findings

Table 9 below shows the distribution of mathematics anxiety percentile score ranges for the entire population.

Table 9: Percentage of math anxiety percentile scores (n = 200)

Percentile Score Ranges	Frequency	Population Percentages
5 – 35%	35	17.5%
40 – 70%	70	35.0%
75 – 95 %	95	47.5%
	200	100.0

Table 9 above probably confirmed the reason for the high failure in core mathematics; D7, E8 and F9 as shown in the 8. Majority of our students in both Junior High School and Senior High School have a high mathematics anxiety and the anxiety inducing stimuli on the mathematics anxiety scale are the following in order of magnitude; *taking an examination (final) in a math course ; thinking about an upcoming math test one hour before time; thinking about an upcoming math test five minutes before time; thinking about an upcoming math test one day before; thinking about an upcoming math test one week before; being given a quiz in a math class; studying for a math test; being giving a homework assignment of many difficult problems which is due the next class meeting; picking up the math test book to begin working on a homework assignment, and getting ready to study for a math test.*

14. Conclusion

Judging from the discussion of the results, it has been recorded that mathematics anxiety is found among student of Junior High School and senior High school. Mathematics anxiety increases from JHS to the SHS level with males having more mathematics anxiety than the females. It is recommended that, as a matter of urgency the Ministry of Education and its major stakeholder Ghana Education Service who employs teachers for both JHS and SHS engage the services of clinical psychologists, counselling coordinators to take students through systematic desensitization using anxiety hierarchy technique and behaviour therapy using anxiety-relief response to enable them reduce their anxiety levels towards mathematics especially in high anxiety arousing stimuli points in mathematics ,Secondly, it suggested that, teachers of mathematics must also look at their methodology and teach mathematics in manner that would not induce anxiety.

Peer tutorials are urgently suggested and this could be possible if mathematics clubs are formed in schools to encourage peer teaching. The Ministry of Education, Ghana Education Service, Mathematics Teachers Association of Ghana and West African Examinations Council's mathematics examiners are to quickly encourage schools and colleges to organize continuous remedial mathematics clinic for students to enable them better their grades.

The National Council for Tertiary Education should take a second look at the policy of not admitting students into the universities because they have D7 in Core Mathematics. For D7 students to be encouraged to go to the Polytechnics and Colleges of Education and not Universities is discouraging. At least students with D7 in core mathematics but have good credit passes in other core subjects and electives that qualify them to gain admission to the university could be given conditional admission. This approach will rather motivate them to study mathematics and get a credit pass at the second attempt because the students on conditional admission would not like to lose the university admission. Until these suggestions are put in place, there is a fear of loss of human resource capital in Ghana where science and technology is panacea to our desired goal of becoming a developed nation.

References

APA. (2007). *Dictionary of psychology*.Washington,DC20002,American Psychological Association.

Ashcraft, M. H. Math Anxiety: Personal, Educational, and Cognitive Consequences.

Current directions in psychological science. October 2002 vol.11 no. 5, 181-185

Ashcraft, M.H. and Kirk, E.P. (2001). The relationship among working memory,

math anxiety and performance. *Journal of Experimental Psychology*: General,130,224-237.

Baenninger, M. & Newcomb, N.(1989). The role of experience in spatial test performance; *meta-analysis roles*. 30, 327-344.

Fredua-Kwarteng and Ahia.(2004). Confronting National Mathematics Phobia.

Retrieved 30 October 2012 from

www.modernghana.com/news/114414/1/confronting-national-mathematics-phobia-in-ghana-p.html

Ghana Web (n.d) *Low patronage of mathematics blamed on inappropriate Teaching methods*. Retrieved 30th October 2012

From http:www.ghanaweb.com/GhanaHomePage/NewsArchive/artikel.php?ID=38682

Ghana Web (2011) W.A.E.C *cancels subject results in 2011 May/June W.A.S.S.C.E.*

Retrieved 30th October 2012 from

http://www.ghanaweb.com/ghanahomepage/NewsArchive/artikel.php?ID=2215501

Mowrer, O.H 1953. A stimulums response analysis of anxiety and its role as a reinforcing agent. *Reading in learning*. L. M. Stolurow (Ed) Englewood Cliffs, NJ: Prentice Hall

Mathematicseducation(n.d).30thApril,2012retrievefrom http://en.wikipedia.org/wiki/Mathematics_education

Staats, A.W. and Eifert, G.H. (1990). The paradigmatic behaviorism theory of emotion basis for unification. *Clinical psychology review,* 10, 539-566.

Strongman .K.T. theories of Anxiety. *New Zealand Journal of Psychology*.

December 1995, Vol. 24 No.2 p4-11.