EFFECT OF TEST ANXIETY AND REVISE TIME ON STUDENTS' TEST PERFORMANCE.

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Abstract*:* Almost every student experiences some level of anxiety before and during a test. If anxiety affects test score, it becomes a challenge. Test anxiety can limit the students' ability to perform well. Some students have the skills and knowledge to do very well in testing situations but their excessive anxiety results in poor test performance (score). The act of assessing students' performance is complex and complicated. In order to assess the work of students without any form of bias and unfairness, educational institutions use several ways, one of which is through tests. We know that testing has become an integral part of our society. Many crucial decisions are based on test results. So, it is not surprising that anxiety during tests has become an issue talked about in schools all over the world. The study focused on test anxiety and revise time and their effects on students' test performance. The study intended to determine the effect of test anxiety on students' test performance(score) , the effect of revise time on students' test performance (score) and also establish the relationship between test performance(score), test anxiety and revise time of undergraduate students of the department of statistics and department of mathematics at the University of Cape coast, Ghana.

A total of 30 students participated in the study. Each participant completed a questionnaire designed to determine the number of hours he or she spent revising his or her notes before the test, whether he or she experienced test anxiety, his or her anxiety level on a scale of 1-10 and his or her score in the test. The study also used Two Sample T-test to assess the test performance (score) of males and females. Results based on Pearson product-moment correlation coefficient indicated that there was a strong negative correlation between test performance (score) and anxiety level. Thus, as anxiety level increased, Test score decreased. There was a strong positive correlation between test performance (score) and

revise time. Thus, as revise time increased, test score increased. From the regression analysis, a linear relationship was established among revise time, test anxiety and students' test performance (score).

Keywords: *testing, test anxiety, test performance*

1. Introduction.

In an educational system, academic performance is of importance to students, parents and teachers. Several studies have shown that factors such as motivation and study time have impacted on students' achievement (Singth, Granville & Dika, 2002).

The work of evaluating and judging students' learning is not easy. In order to come out with an objective evaluation of their work, teachers and instructors use many methods and means, one of which is testing. We are aware that in this day and age, testing has become an intrinsic part of our society. It has become more extensive not only in education but in every area of life and many important decisions are explicitly based on test results. This opinion is also stutted by Spielberger and Vag (1995), two experts in the area of test anxiety. These researchers indicate that "… achievement test scores, as well as academic performance, are increasingly used in evaluating applicants for jobs and admissions into educational programs. Consequently, examination stress and test anxiety have become pervasive problems in modern society". This view was held previously by another renowned researcher in the area of test anxiety, Sarason (1959), who commented: "We live in a test- conscious, test -giving culture in which the lives of people are in part determined by their test performance". Thus, it is significant to stress that although tests are highly relevant and dependable, one cannot be certain whether the results sincerely reflect students' intelligence or their real capabilities.

Anxiety is a normal phenomenon that form a general reason for poor academic performance amongst students globally. Spielberger (1983) defined the "feeling of anxiety" as an immediate, temporary emotional experience with immediate cognitive effects that is pronounced by feelings of worry, nervousness, and tension in response to a specific situation (e.g., teaching and learning contexts). Practically, everyone experiences the feeling of anxiety at some time in their life which influences their performance and effectiveness in various circumstances. People differ in the levels of anxiety they experience (Betrams, Englert, & Dickhauser, 2013). Some people feel anxious frequently and to a higher degree than others. The degree of interfering anxiousness with the ability to differs amongst people. The feeling of anxiety encourages some people to improve by motivating them to attempt more, while forbids others' performance by interrupting mental processes required to perform well. Test anxiety is a variable related to test-takers' traits and has thrived because of the continuous use of tests and their importance to students. This importance begins with the pre-education level and continues through the college level (Rubin, 1999). A low level of anxiety could be good. It acts as motivation and can increase achievement by pushing the students to do their best (Akanbi, 2013). Many students with test anxiety cannot concentrate on the test questions which, in turn, triggers poor performance on tests (Atasheneh & Izadi, 2012). Test anxiety perceives like an undamaging problem to a few people, but it can be serious when it leads to high levels of anxiety and low academic performance. As Zeidner (1998) pointed out, "test-anxious students tend to be easily distracted on an exam, experience difficulty in comprehending relatively simple instructions, and also have difficulty organizing or recalling relevant information during the test". Sarason (1984) claimed that the test-anxious person experiences worry, insecurity, and self-doubt in evaluative situations. These internal factors decrease attention to the task at hand and lead to poor performance. For instance, if an individual's past experience is negative, the test anxiety level will be higher leading to lower performance. In contrast, if an individual's past experience is positive, the test anxiety level will be lower leading to higher performance. Also, if a student encounters difficulty in understanding his/her notes, they may lose hope and avoid reading, and as a result experience high test anxiety. Another factor that affects students' performance is revise time, Revise time is the time spent by

students in getting prepared for a test. It does not really matter whether learners study at the same time each day, whether they shut off the radio or television while on private reading and whether they use supplementary materials in their personal studies. Study time also includes some external activities that affects the internal process of learning (Rothkopf 1982). Many studies have been carried out on study time behaviour and students' achievement. The recent ones include that of Logunmakin (2001), Kumar (2002) and Gbore (2006). They all agreed that study time attitude has a strong relationship with academic performance of students while other researchers like Owolabi (1996) and Adeyemo (2005) concluded that students' academic achievement was the outcome of a combination of the study time behaviour and other factors in any course of study. Adeyemo (2005) specifically opined that study time attitude is an exercise that goes beyond merely reading for pleasure. Study time problems that have to do with student's engagement in home work, assignments, reading and note taking, study period procedure, students' concentration in examination and teachers' consultancy services necessitated this study. From previous studies, it has been shown that test anxiety has effect on test performance and revise time also has effect on test performance. This current study was conducted to investigate the effect of test anxiety and revise time on students' test performance.

2. Research Literature

Anxiety is a phenomenon that people often experience in their daily lives. When a student prepares very well for a test, his or her anxiety level reduces drastically as compared to a student who is not well prepared for the test. Anxiety can be described as the tense, unsettling anticipation of a threatening but vague event; a feeling of uneasy suspense (Rachman, 2004). As a result of the nature of anxiety, researchers have provided a classification of this phenomenon into different sub-categories (e.g., language anxiety, speech anxiety, test anxiety). As was mentioned above, we will concentrate on one of these categories, namely, test anxiety. Test anxiety as a phenomenon has received considerable attention since 1950s. It is considered to be a common educational problem, referring to a situation when students do not feel confident about their abilities, which is reflected especially in

their performance and tests results. This view is also supported by a study conducted by Spielberger (1962) with college students, which revealed that while only 8 out of 138 low-anxiety students dropped out of college because of academic failure, twenty six out of 129 high anxious students left for the same reason.

According to Zeidner (1998), test anxiety is a set of phenomenological, physiological and behavioral responses that accompany concern about possible negative consequences or failure on an exam or similar evaluative situation. As we see from Zeidner's statement, test anxiety is strongly related to failure consequences. This connection can be noticed even in (Sarason & Sarason, 1990) who stated that when not in an evaluational situation, or anticipating one, the highly test anxious individual may not worry about possibilities of failure, embarrassment and social rejection. But in evaluational situations these possibilities become active. We should also emphasize the fact that students who suffer from test anxiety do not necessarily lack in intellect or drive. Test anxiety and other deficits related to test anxiety, interfere with academic performance (Everson & Millsap, 1991).

In order to understand the way test anxiety affects students' performance, it is important to take into consideration the study of Liebert and Morris (1967). These researchers analyzed the responses of students to Sarason and Mandler's Questionnaire (TAQ: Sarason & Mandler, 1952). The results indicated that test anxiety consisted of two major components. The first component was emotionality which was related to the physical reactions to test situations, such as nervousness, sweating, constantly looking at the clock, pencil-taping and so on. The second factor was worry, which comprises the psychological or cognitive aspect of test anxiety. "Worry relates primarily to cognitive concern(s) about the consequences of failure" Liebert and Morris (1967). This is not surprising since a student's test anxiety is something that cannot be perceived by a teacher or instructor. Students' actual levels of test anxiety cannot be directly measured or examined. The only thing that can be observed is the students' manifestation of test anxiety in the form of emotionality. Morris and Liebert study (1970) found that the factor of worry had a stronger negative relationship with performance outcomes than emotionality, in a group of high school students. This suggests

that it is the cognitions or thoughts about the evaluative situation that will have he greatest impact on performance under such conditions.

Considering the fact that this phenomenon has a variety of sources, a lot of research have been conducted in order to identify how test anxiety affects performance. According to one review of the research on test anxiety, different possibilities have been examined. For example, some studies have identified the root of test anxiety as lying in students' poor preparation. Those studies suggest that some students ineffectively organize or process information and they perform poorly on tests because of this. Naveh-Benjamin et al (1987) have found that when compared with less anxious students, highly test-anxious students have difficulties in organizing material to be learned. As several research studies have noted, highly test anxious students have less effective study habits compared to their low anxious counterparts (Culler & Holahan, 1980). This view is also supported by Hembree (1988), who suggests that lack of effective study skills contributes to poor performance under evaluative conditions, which in turn leads to heightening feelings of anxiety when it comes to performing in subsequent examinations. Support of this research emerged from treatment studies that have concentrated on helping students to improve study skills. The results of these studies suggest that study skills can also help to reduce test anxiety and improve performance.

A study conducted by Graven (2008) on the relationship between students' anxiety and their short-study time session for examination revealed that the effect of anxiety on examination preparation was significant on the students' performance when the results were published. In the study, 20 male and 58 female University students responded to self-ratings on their personal anxiety and their study time while preparing for tests/examination. It was speculated that the more a student consumes time while studying, the more accurately his or her retention of the materials studied, and the less his/her anxiety towards the test or examination. The study also indicated that 'unhealthy' student anxiety operationally accounted for low achievement scores on amount of time per study session or time (in days) when he started revision. High scores on anxiety level were also implied 'healthy' study time.

Crede and Nathan (2008) in their researches at the University of Wisconsin said that study time, ability, and attitude inventories were factors found to compete with standardized tests and previous grades as parameters of academic performance. They found that study skill inventories and constructs are largely independent of both high school grades and scores on standardized

admissions tests but moderately related to various personality constructs. These results were however inconsistent with previous theories on study time. Study time motivation and study skills exhibited the strongest relationships with both grade point average and grades in individual courses. They also explained that academic anxiety was found to be an important negative predictor of students' performance. Scores on longer study time duration and attitude inventories were confirmed as the most predictive indices of performance, based on the depth-of-student preparation and commitment. In all, long study time and skill measures tend to improve prediction of academic performance more than short-study sessions

A study on the relationship between test anxiety and academic performance in 4,000 undergraduate and 1,414 graduate students found a significant but small inverse relationship between test anxiety and grade point average (GPA) in both groups. Low-test-anxious undergraduates averaged a B+, whereas high test-anxious students averaged a B (Chapell et al., 2005).

A lot of students have been affected academically by many known and unknown reasons. This is the main reason why we found it necessary to conduct a research with university students. Another reason is related to the fact that text anxiety and revise time affect a considerable number of students and impair their performance. Considering the fact that test anxiety and revise time are complex and problematic areas, it is necessary to determine the problems, and provide recommendations on the ways of reducing anxiety and improving revise time, which would be helpful to both students and teachers.

3. Method

3.1 Subjects

The study was conducted at the School of Physical Sciences, in University of Cape Coast, Ghana. The subjects in the study consisted of 30 students of the following branches: Department of Mathematics, Department of Statistics. Of the subjects, 16 (53.3%) were male and 14 (36.7%) were female students, with a male-female ratio of 16:14. The group consisted of 8 (26.7%) Mathematics, 9 (30%) Statistics, 6 (20%) Actuarial Science and 7 (23.3%) mathematics with economics students who took a data analysis test out of 10.

3.2. Instruments

Questionnaires were used to collect the data using simple random sampling technique. The varibles in the questionnaire included Gender, Revise time, Test anxiety and Test score. The questionnaires were administered to the subjects one week before their final exams.

4. Data Analysis

In order to assess the effect of test anxiety and revise time on students' performance, descriptive statistics were used. A sample of 30 respondents comprising 16 males and 14 females was taken. From Table 1, the maximum number of hours used as revise time is 8.5 and the minimum is 3.5 hours. The highest mark obtained in the test is 8 and the lowest is 4. The highest anxiety level is 5.5 and the lowest is 2. The average score in the test is approximately 6 and on the average 5.883 hours is used as revise time with an average anxiety level of 3.767.

Table 1: Descriptive Statistics

Descriptive Statistics

		Revise Time	Test Score	Anxiety level
N	**Valid**	30	30	30
	Missing	0	0	0
Mean		5.883	6.167	3.767
SE Mean		0.245	0.235	0.196
Std. Deviation		1.343	1.289	1.073
Variance		1.805	1.661	1.151
Minimum		3.500	4.000	2.000
Med.ian		6.000	6.000	3.750
Maximum		8.500	8.000	5.500
Skewness		0.080	-0.030	0.050
Kurtosis		-0.710	-1.200	-1.070

From figures 1, 2, 3, each of the variables is normally distributed with a p-value>0.05. Also, from figures 7 and 8, there is a linear relationship between test score and revise time and test score and anxiety level respectively. Figures 4, 5, 6, show no outliers. From the data set, test score, anxiety level and revise time are continuous variables and gender is categorical. There are no missing values. The results indicate that the participants are affected at least at some degree by test anxiety.
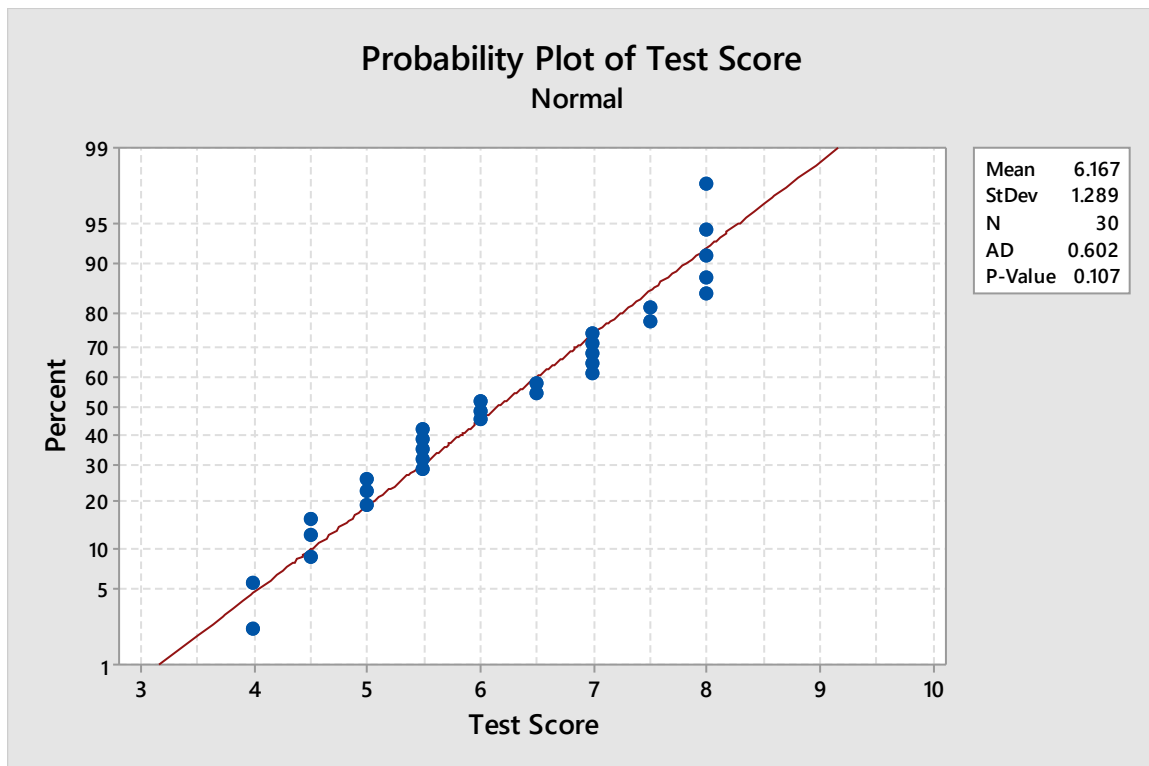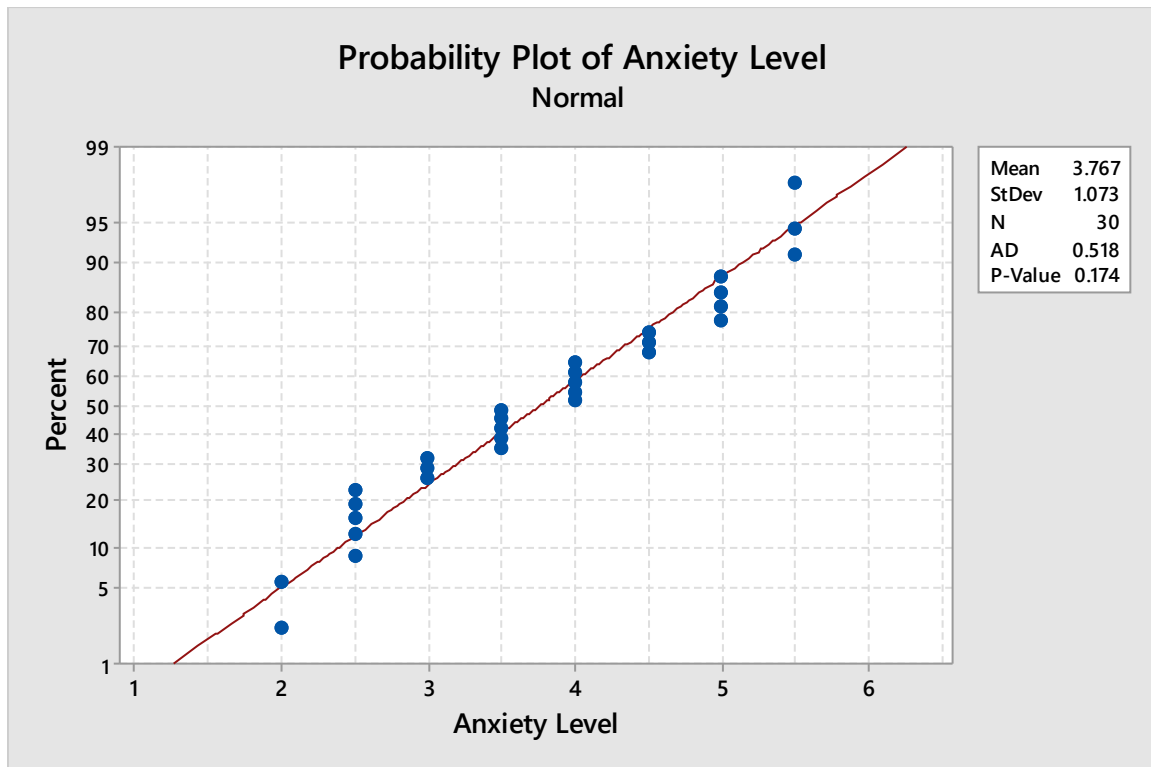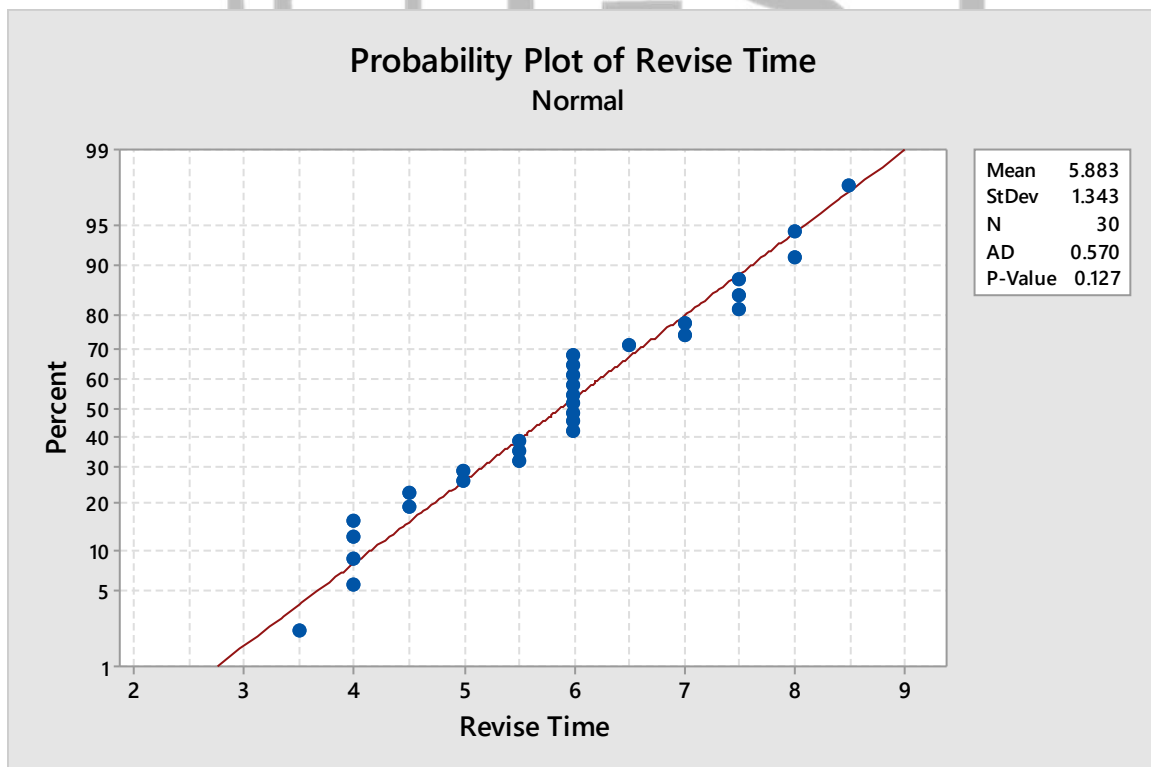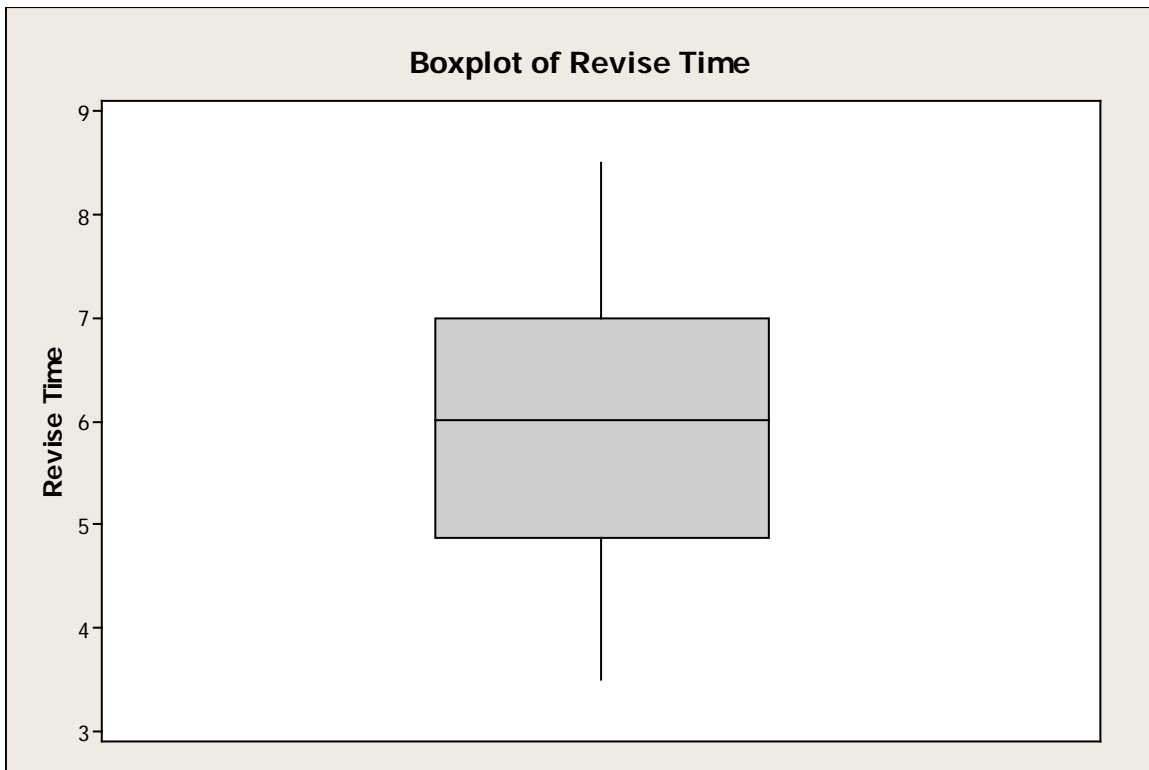

Figure 1

Figure 2

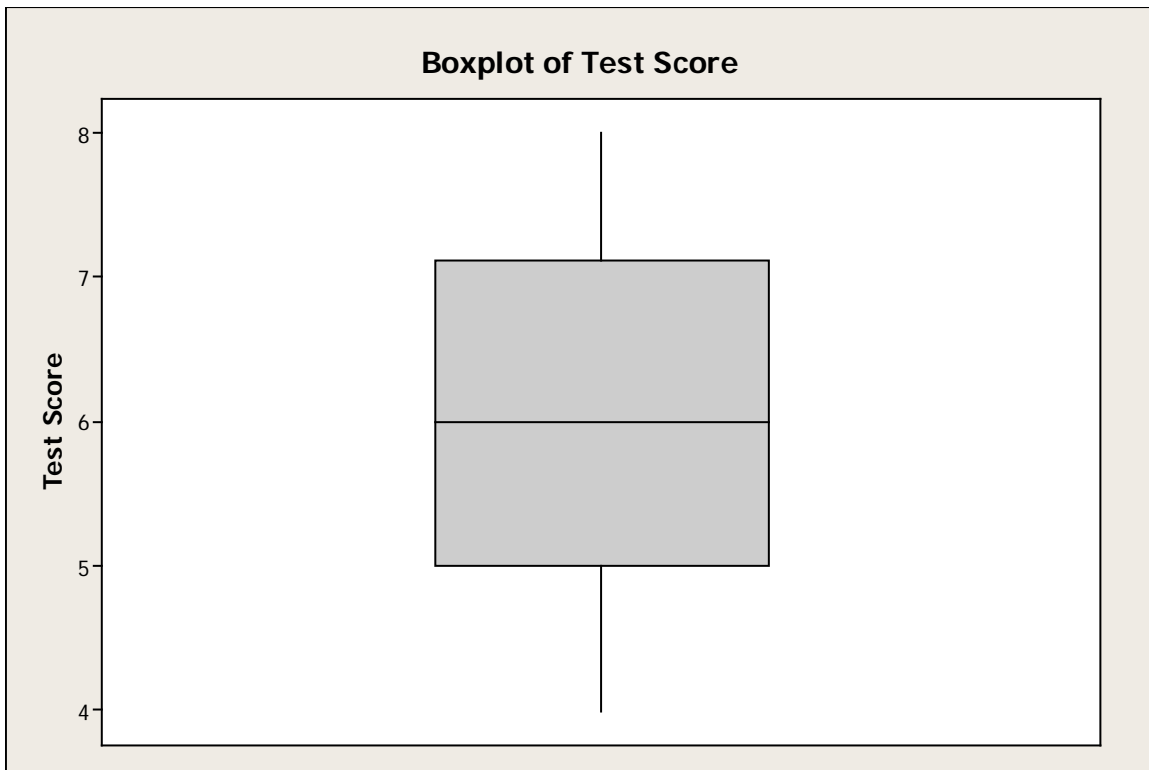**Figure 3**
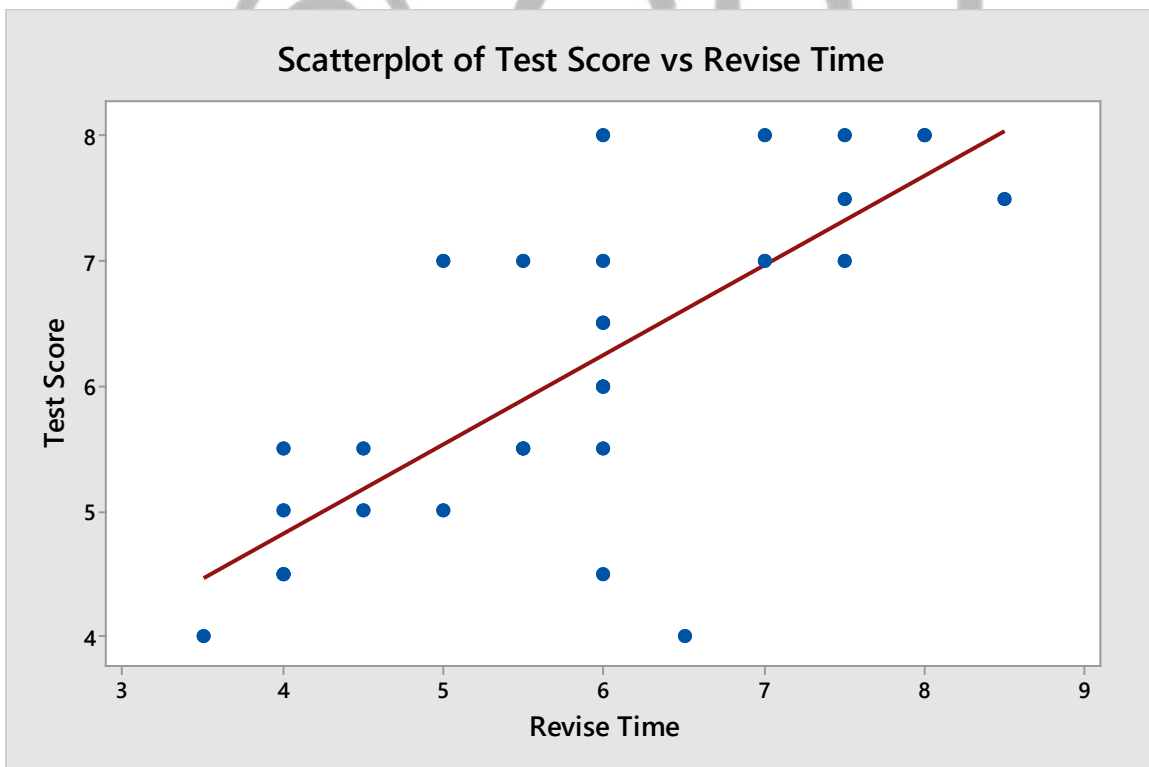
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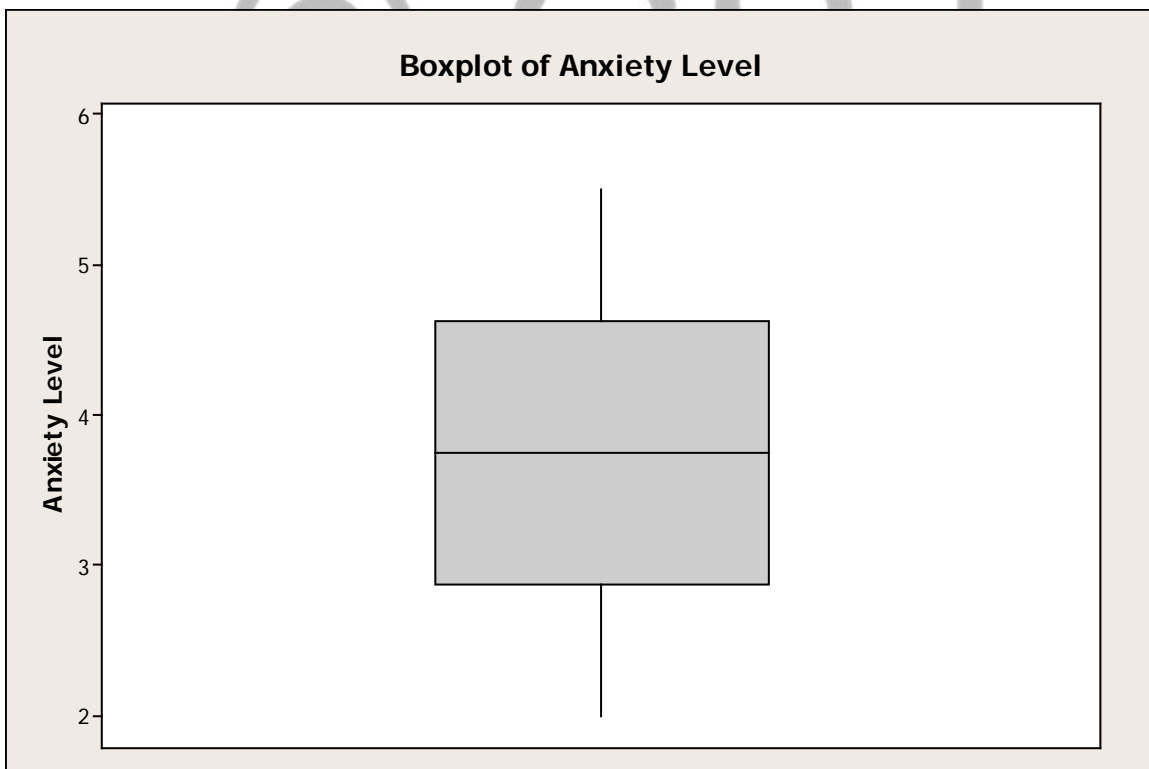
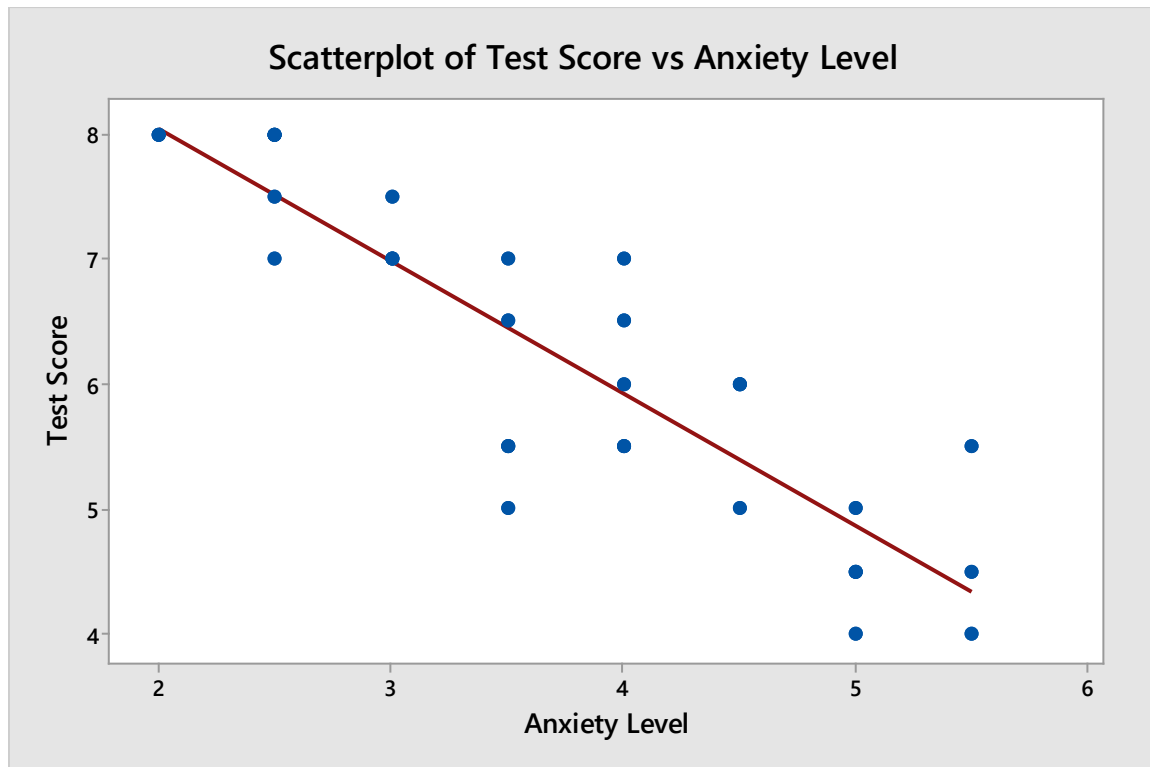**Figure 5**

Figure 6

Figure 7

Figure 8

Two Sample T-test is conducted for Test score and Gender to test the hypothesis.

H_0 : There is no significant difference between the mean test performance of males and females.

H_1 : There is a significant difference between the mean test performance of males and females.

The mean test score of females is 6.29 with a Standard deviation of 1.22. The males have a lower mean test score of 6.06 and a standard deviation of 1.38. Thus from the sample data, the females performed better than the males. Comparing their standard deviations, the females were more consistent with their test score around their mean than the males. Since the P-value (0.644) >0.05, we fail to reject H_0 and conclude that there is no significant difference between the mean test score of both males and females. Hence, we can infer that the test performance of males and females are the same.

Table 2: Two-Sample T-Test for Test score, Gender

Two-Sample T-Test for Test score, Gender

Gender	N	Mean	St Deviation	SE Mean	p-value
Male	16	6.06	1.38	0.34	0.644
Female	14	6.29	1.22	0.33	

<u>Correlation between Test score and Test Anxiety:</u>

H_0 : There is no linear relationship between Test score and Test anxiety.

H_1 : There is a linear relationship between Test score and Test anxiety.

From the correlation output, Correlation coefficient, r= -0.881. This means there is a strong negative correlation between test score and Test anxiety. In other words, the higher the Test anxiety, the lower the Test score. Hence, Test anxiety has a negative effect on Test score. Since the significance value of 0.000 is less than 0.05, we reject H_0 and we conclude that there is a linear relationship between Test score and Test anxiety and this effect is unlikely due to chance. This result is in harmony with the work of (Afolayan, Donald, Onasoga, Babafemi & Juan, 2013) which indicates that anxiety which is expressed as physiological, psychological and behavioral during examination negatively affects student's performance and outcome in the examination. (Dordinejad et al., 2011) discovered that when test anxiety is higher, academic achievement (GPA) is lower. (Onyeizugbo, 2010) showed that students with higher test anxiety have lower academic achievement.

Table 3: Correlation between Test score and Anxiety

Correlation between Test score and Anxiety

		Test score	Test Anxiety
Pearson Correlation	Test score	1.000	-0.881
	Test Anxiety	-0.881	1.000
Sig.(1 tailed)	Test score	0.000	0.000
	Test Anxiety	0.000	0.000
N	Test score	30	30
	Test Anxiety	30	30

Correlation between Test performance and Revise time:

H_0 : There is no linear relationship between Test score and Revise time.

H_1 : There is a linear relationship between Test score and Revise time.

Correlation coefficient, r=0.744. This means there is a strong positive correlation between test performance (score) and revise time. Thus, the higher the revise time, the better the test score. Since the significance value of 0.000 is less than 0.05, we reject H_0 and we conclude that revise time affects test performance and this effect is unlikely due to chance.

Table 4: Correlation between Test score and Revise time

Correlation between Test score and Revise time

		Test score	Revise time
Pearson Correlation	Test score	1.000	0.744

	Revise time	0.744	1.000
Sig.(1 tailed)	Test score	0.000	0.000
	Revise time	0.000	0.000
N	Test score	30	30
	Revise time	30	30

Regression equation

Response Variable: Test score

Predictor Variable: Test Anxiety, revise time

The regression equation is

Test Score = 8.92 - 0.932 Test Anxiety + 0.129 Revise Time

Thus, for a unit change in test anxiety, test score decreases by 0.932 when the effect of revise time is held constant. Also, for an extra hour spent revising note, test score increases by 0.129 when the effect of test anxiety is held constant.

Table 5: Coefficients[a]

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	T	P
	B	Std. Error	Beta		
1	(Constant)	1.395	8.921	6.40	0.000
	Test Anxiety	0.1737	-0.9324	-5.37	0.000
	Revise	0.1387	0.1287	0.93	0.362

	Time				

a. Dependent Variable: Test Score

Since the p-value for Test Anxiety (0.000) is less than the p-value of Revise Time (0.362), it implies that Test Anxiety contributes more to the prediction of Test Score than Revise Time because the lower the p-value, the more the contribution.

Table 6: Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.885	0.784	0.768	0.621

a. Predictors: (Constant), Test Anxiety, Revise time

From the output, R^2=78.4%, R^2 (Adjusted) =76.8%. This means that 78.4% of the variability in test score is being explained by the model. The difference in R^2 and Adjusted R^2 (78.4-76.8) = 1.6 indicates that our model will lose about 1.6% of the 78.4% variation explained in test score (performance) if we are to generalize our model beyond the sample to the population of students. Tolerance, $T = 1-R^2 = 1-0.784 = 0.216$. Variance Inflation Factor, VIF=$1/T$ =$1/0.216$ =4.63. VIF shows whether an independent variable has a strong relationship with another independent variable. Since tolerance is greater than 0.1 and VIF is less than 10, we conclude that there is no multicollinearity and that the assumption of multicollinearity is not violated. In order to fit a multiple linear regression model, there should be no multicollinearity (linear relationship between two independent variables) in the sense that the presence of one independent variable will not affect the other independent variable in the model.

Analysis of Variance

Table 7: ANOVA[a]

ANOVA[a]

Model	Sum of Squares	df	Sum of Squares	Mean Square	F	P
1	Regression	2	37.748	18.874	48.91	0.000

Residual	27	10.418	0.386		
Total	29	48.167			

a. Dependent Variable: Test score

b. Predictors: (Constant), Test Anxiety, Revise Time

Anova Hypothesis

H_0 : The model is not significant

H_1 : The model is significant

The F statistic which is the ratio of the mean square regression to the residual mean square indicates the improvement due to our model and the difference between our model and our data. In other words, it is the measure of how much the model has improved the prediction of Test score compared to the level of accuracy of the model. The F statistic of 48.91 with its associated significance value of 0.000 tells us that our regression model overall predicts Test score significantly well or Test anxiety and Revise time together contribute significantly to the prediction of Test score.

5. Conclusions and Discussions

The findings of this study are as follows:

From the analysis, both revise time and test anxiety have effect on students' test performance (score). Hence increasing revise time will decrease the level of anxiety. Thus increasing test performance of students.

Supporting this finding, Awolabi (1996) maintained that a combination of the study time and other factors explain students' academic performance in any course of study. In the same way, Adeyemo (2005), opined that study time is a pattern of activity that goes beyond merely reading for pleasure. A student who wants to graduate with good grades has to read his or her books with understanding and that will take more time to accomplish.

 In the same vein, Kunal (2008) observes that students who are very successful in their desired career have longer study time. It was stated that students who apply these attitudes in all of their courses always come out successful. It is necessary

for students to develop good study habits in order to know how long it will take them to study and understand their course of study. Supporting this finding, Dika (2002) agreed that a grade is a primary parameter showing such learning. If a learner earns high grades or scores high marks, it is an indication that he or she may have taken a lot of time to study well while low grades are interpreted as using lesser time for learning. The results also show that test anxiety causes negative effects. The students listed that some of the factors that cause test anxiety are related to lack of preparation for the tests or inappropriate test preparation, fear of negative evaluation, bad experiences on previous tests, time limitation and pressure, the number of items included in the test and the difficulty of course content. The students admitted that test anxiety causes difficulty in retrieving from memory the information they have learnt and decreases their concentration during the test. As a result of this, they make more errors. It also prevents students from displaying their real knowledge and abilities in the test and transferring their real performance to test results. In other words, it is an obstacle to efficient study and to an effective use of the knowledge already acquired. Furthermore, test anxiety causes physical problems. Students who have high levels of test anxiety confess that they suffer from headache, insomnia, increasing heart pulse and stomach disorder before and during test administration. They say that test anxiety causes psychological problems as well. Apart from these negative effects, it seems that test anxiety has a positive effect on the learners since it is not a factor that causes them to study less.

Therefore, students should spend more time revising their books before a test. This will help reduce test anxiety and improve their academic performance.


In view of the findings, the following recommendations are made:

i.   It is essential to develop a curriculum that is inclusive of strategies of coping with test anxiety and also develop guidebooks to help students deal with test anxiety.

ii.   Students should set a study time table and stick to it.

iii.   Students should get assistance from instructors, classmates and friends whenever they have difficulties in their studies.

iv.   Students' should develop good study habit in order to understand how long he/she can study for effective outcome

v. Teachers should inform the students on content, test techniques, number of the items included in the test before the administration as Alcala (2002) suggests that teachers should familiarize students with the exam format, the type of rating system.

vi. Students should seek counselling before doing examinations so as to increase their confidence. They should also have adequate rest before examinations and avoid last minute rush revision.

6. Limitations of the Study

The study is limited to the students of only one institution (School of Physical Sciences, University of Cape Coast). Secondly, the study is limited to subject variables such as: gender, revise time, anxiety level and test scores of the students. In conclusion, considering the fact that the study is limited to test anxiety and revise time of the University of Cape Coast students, further research should focus on more analytic issues such as IQ, study habits, teachers' attitude on test anxiety before and after the exam.
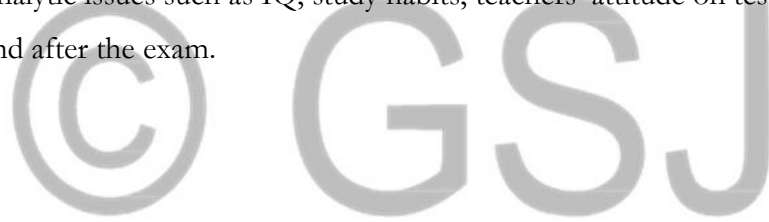
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