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EFFECTS OF TEST ANXIETY ON SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT IN ECONOMICS IN DELTA STATE

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ABSTRACT

This study investigated the effects of test anxiety on academic achievement of secondary school students in Economics in Delta State. Four research questions guided the study. The study adopted a causal-comparative (ex post facto) design. The population of the study comprised 2,310 Senior Secondary (SS) II Economics students in public secondary schools in Oshimili South Local Government Area of Delta State. The study's sample was intact classes of 237 Senior Secondary II students (102 males and 135 females) selected from four (4) public secondary schools using multi-stage sampling technique which combined purposive sampling with convenience sampling at different stages. Two instruments were used for data collection, namely, the Test Anxiety Inventory (TAI) and Economics Achievement Test (EAT), both of which were validated by experts. The reliability of the EAT and TAI were determined using Kuder-Richardson 20 (RK-20) and Cronbach Alpha method respectively and reliability coefficient of 0.87 and 0.99 indicating that the instruments were reliable. Descriptive statistics (mean and standard deviation) and inferential statistics (independent samples t-test and two-way ANOVA) were used for data analysis. The results revealed among others that: male and female students performed similarly in Economics; gender had no significant effect on achievement; likewise, male and female Economics students had comparable test anxiety levels, with no significant gender difference. The study recommended among others that school counsellors should implement regular test anxiety management programmes such as relaxation techniques, mindfulness, and positive self-talk sessions for students.

Keywords: Academic, Achievement, Anxiety, Economics, Effect, Test, Secondary schools, Students

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Introduction

Education is considered the major source of progress in all over the world. It is accepted the main component in improvement and efficient source of raising quality of life. Education is a dominant feature for improving the societal, monetary and wellbeing of nation entirely. Education cautiously strength the ethics, customs, beliefs, experiences, practices, information, traditions, expertise and likely ways of life and behaviours, moved from one generation to the coming generations (Aleed, 2016; Peleg, 2009). In education, tests are important tools for decision making in this competitive world and students are assessed as for their achievement, aptitudes and capacities with tests and examinations (Rana & Mahmood, 2010). The goal of every educational setting is to monitor students' academic achievement by using the best test mode for excellent achievement in schools. Male and female secondary school students' academic achievement in Economics has been observed to be poor. This is evident in a report of Osadebe (2014) that it is not uncommon that senior secondary school students perform poorly in SSCE Economics. Also, other studies by Smithers (2008), Ndupuechi (2009), Augustine (2010, 2013), Atanda and Jaiyeoba (2011) and Tahir (2012) had similar submissions that secondary school students' academic achievement in Economics is low. Corroborating this view, the Premium Times (2015) reported that out of 1,593,442 candidates who sat for (WASSCE) May/June, 2015, only 616,370 candidates came out with five credits and above, including English language, Mathematics and Economics. In 2013, total candidates who obtained five credits in English language, Mathematics and Economics were 639,760, while in 2014, 529,425 candidates obtained five credits in English language, Mathematics and Economics. The above situation is worrisome because, it has shown that the academic achievement of both male and female secondary school students in Economics is fluctuating. One may possibly feel that this continuous fluctuation of students' academic achievement is occasioned by test anxiety. Anxiety is a known phenomenon that account for a common cause of poor academic performance among students globally. It is a universal irrefutable fact in human life that control an individual's achievement in numerous situations; an average level of anxiety is needful in nursing people hardworking and being liable of what they have to do (Khan et al, 2018).

Test anxiety, which is viewed as an important variable often related to academic achievement, is pervasive problem in the modern society (Rajasekaran, 2016). As the information age continues to evolve, test scores will become even more important than they are today in evaluating applicants for demanding jobs and candidates for admission into highly competitive educational programmes. Because test anxiety generally causes decrements in performance and undermines academic achievement, the development of effective therapeutic interventions for reducing its adverse effects will continue to be an important priority for counsellors, psychologists and educators (Putwain, 2008). Anxiety is a normal reaction to a stressor and it may help an individual to deal with a demanding situation by motivating him/her to cope with it, but when anxiety becomes excessive it can have a serious impact on daily life and interferes with the normal functioning of a person (Hartley & Phelps, 2012). Anxiety can be identified by a variety of physical, emotional, cognitive and behavioural symptoms such as

palpitations, sweating, trembling, shortness of breath, sense of choking, chest pain, headache, nausea, stomach upset, dizziness, numbness or tingling, chills or hot flashes, restlessness, fatigue, muscle tension and sleep problems. Anxiety is universal and everyone experiences this feeling in varying degree. It is an emotional reaction characterized by fearful anticipation of an unpleasant event in the future. Fear is a reaction to a real external danger that threatens the person with possible injury and has no real external stimulus but the individual himself (Beleta, 2008). Worry may give rise to anxiety. It is more often imaginary than real and a generalized emotional state rather than specific one. In short, the individual is not anxious about specific things. Worry for students relates primarily to cognitive concerns about the consequences of failure. Students who think or verbalize a negative or pessimistic expectation manifest worry (Ballesteros, 2005). Anxiety is one of the emotional components of human life. Every task performance to an extent is accomplished by some measures of anxiety. Anxiety is regarded as a common psychological problem among human beings with its physical, emotional, and social manifestations. Anxiety is the sensation of feelings, fear, or nervousness (Nwimo 2006). Anxiety may also be inferred from many cognitive and perceptual processes. An anxious person may report sensory- perceptual distortions of non-psychotic proportions which may reflect in attention processes. Cognitive performance and information processing may be critically affected by anxiety (Woolfork 2009). Anxiety may develop during their adolescence stage when they are predisposed to a kind of environment they were situated, particularly at home and family. Sometimes, overly critical parents whose high expectations could give a negative feeling on the children. Parents who are self-critical and anxious about the failure of their children because they failed to meet their expectations. Perhaps, there are parents who are overly protective and would always give a notion that the environment is not safe. Above all, the greatest challenge a child may encounter in his/her life is the fear of being abandoned by their parents (Ngwoke, 2010). Test and anxiety may be influenced by a wide range of factors such as environmental factors (Aremu & Sokan, 2003) teacher factor and psychological factors within the students. Such psychological factors encompass the individual's cognitive variables such as motivation, adjustment, study skills, gender and others (Ngwoke, 2010).

Academic reasons like enormous syllabus, the difficulty of the curriculum, long studying hours, and emotional factors like lack of peer support, competitive environment, rigid authoritative and non-encouraging faculty, lack of recreational activities, staying away from home, financial problems, uncertain future, cultural and minority issues, mismatch between capability and expectation are some reasons of stress and anxiety among medical and engineering students (Foster & Spencer, 2003). However, there can be other reasons for anxiety among the students like stress due to family problems, a natural disaster, victimization by crime, physical abuse, medical illness, intoxication etc. Students also have test anxiety, performance anxiety and choice anxiety. Students in the present digital era are faced with greater choice, more competition and less time to consider their options or seek out the right advice which many a time leads to anxiety. Hancock (2001) investigated the effects of students' test anxiety and teacher's evaluation practices on students' achievement and discovered that all students, especially students with high anxiety

level, performed poorly and were less motivated to learn. Thus, he concluded that when students who are particularly test-anxious are exposed to a highly evaluative assessment environment in their educational institution, they perform poorly and are less motivated to perform (Hancock, 2001). A research study conducted by Cassady and Johnson (2012) which investigated the effect of cognitive test anxiety on students' academic performance, found out that cognitive test anxiety exerts a significant stable and negative impact on academic performance measures. A study was conducted to explore how test anxiety affected students' performance levels in the sciences, especially in Physics, and concluded that low test performance was exhibited due high level of anxiety (Olatoye, 2017; Oludipe 2009). Studies on test anxiety and performance in many secondary school subjects such as economics have indicated that there is an inverse relationship between the test anxiety state of students and their performance (Akanazu & Okoli, 2019; Karjanto &Yong, 2015; Nazir, Izhar, Talal, Sohail, Majeed & Almas, 2021; Owan, Bassey, & Ini, 2020; Owan, Bassey, Omorobi, et al., 2020; Shafiq, Erum & Muhammad, 2021). Furthermore, the result of Syokwaa, Aloka, and Ndunge (2014) showed a presence of high personality anxiety levels at 79%, while the test anxiety indicated a relatively low-normal anxiety level of 27%. The study found that there was a correlation between anxiety levels and academic achievement and that high anxiety had a negative impact on the quality of academic result recorded by students (Syokwaa, Aloka& Ndunge, 2014). It has also been established that students encountered some high anxiety causing challenges which affect their ability to perform effectively, and girls were found to be more prone to high anxiety levels as compared to boys (Syokwaa et al, 2014). In another study, Owan (2020) used a quasi-experimental approach to examine the nexus between gender, test anxiety and test items scrambling on performance in Mathematics. It was discovered that there was no significant gender difference on performance; tests anxiety and items scrambling had significant effects on performance in Mathematics respectively; low students' performance in Mathematics was associated with high test anxiety and test items arrangement from complex to simple; there was a significant interaction of test anxiety worry, emotion and total on performance in Mathematics (Owan, 2020).

Many research studies have been conducted in different countries to find out the relationships and differences of test anxiety with students' achievement in different subjects including their gender (Ali, 2012; Asuquo & Onasanya, 2006; Ndirangu, Muola, Kithuka & Nassiuma, 2009). Several researchers explored gender differences with respect to test anxiety and found that females have higher levels of overall test anxiety than males (Cassady & Johnson, 2012; Chapell, Blanding, Silverstein, Takahashi, Newman, Gubi & McCaann, 2005). Cassady and Johnson (2012) explained that one explanation for differences in test anxiety on the basis of students' gender is that males and females feel same levels of test worry, but females have higher levels of emotionality. Zeidner (2007) on the basis of his research, concluded that difference in test anxiety scores of males and female is due to gender difference in scholastic ability. It is quite evident from the arguments given above and results of the studies reported that text anxiety affects achievement along with other variables such as motivation to learn, ability to benefit from formal instruction and gender. This diversification of effects of text

anxiety led researchers to think of text anxiety as at least bi-dimensional construct (Cassady & Johnson, 2012; Chapell et al., 2005) with affective and cognitive components. It is in the light of the above that this study investigated the effects of test anxiety on the secondary school students' academic achievement in Economics in Delta State.

Statement of the Problem

An estimated 2-3 students in any given classroom are highly anxious. Students' poor achievement in Economics over the years in Senior Secondary School Certificate Examinations (SSSCE) has attracted a lot of concern. Many researchers observed that secondary school students' academic achievement in Economics may be very low because of the poor teaching and assessment methods used in schools. Since the mid 1990's studies have shown that the academic achievement of students in secondary schools and tertiary institutions have witnessed a systemic decline across all subjects, faculties, departments and schools (Akinsanmi & Lukman, 2018). These scholars have identified students' phobia for tests and examinations as one of the prime causes for the decline in their achievement. Anxiety being an emotional problem if not attended to professionally could be carried over by these students to real test conditions. Anxiety a psychological imbalance often experienced by testees and if not well managed can lead to academic failure or poor academic achievement among students. Some pronounced cumulative effects of academic failure or poor performance resulting from test anxiety on students could include withdrawal syndrome, examination phobia, delinquency, involvement in crimes, low self-esteem, depression among others. The identified causes of test anxiety and its prevalence prompted the researchers to investigate the effect of test anxiety on academic achievement of secondary school students in Economics in Delta State.

Purpose of the Study

The main purpose of this study was to ascertain the effects of test anxiety on secondary school students' academic achievement in Economics in Delta State. Specifically, the study sought to determine:

1. the mean achievement scores of male students in Economics.
2. the mean achievement scores of female students in Economics.
3. the mean test anxiety scores of male students in Economics.
4. the mean test anxiety scores of female students in Economics.
5. ascertain if there is interaction effect on gender and achievement with respect to test anxiety.

Research Questions

The following research questions guided this study;

1. What are the mean achievement scores of male students in Economics?
2. What are the mean achievement scores of female students in Economics?
3. What are the mean test anxiety scores of male students in Economics?
4. What are the mean test anxiety scores of female students in Economics?

Hypotheses

The following null hypotheses were tested at .05 alpha level in the present study:

1. The difference in the mean achievement scores of male and female students in Economics is not significant.

2. The difference in the mean test anxiety scores of male and female students in Economics is not significant.
3. The interaction effect between sex and achievement scores of students with respect to test anxiety is not significant.

Methodology

This study adopted causal-comparative (ex post facto) research design. This design was appropriate because the study aimed to determine the cause-and-effect relationship between preexisting variables (gender and test anxiety) and academic achievement in Economics. In this design, the researchers did not manipulate the independent variables (gender and test anxiety) but rather observed and analyze existing differences between groups. This approach is particularly useful when experimental manipulation of variables is unethical, impractical, or impossible, as is often the case with demographic characteristics like gender or psychological traits like anxiety. The core principle involves identifying two or more groups that are already differentiated on an independent variable (e.g., male vs. female students, or students with high vs. low test anxiety) and then comparing them on a dependent variable (academic achievement in Economics). This allows for the investigation of potential causal links without direct intervention, relying instead on statistical analysis to infer relationships. The choice of this design aligns perfectly with the study's objective to explore how existing levels of test anxiety and gender differences correlate with academic outcomes in a specific subject. The target population of the study was 2,310 Senior Secondary (SS) II Economics students in public secondary schools in Oshimili South Local Government Area of Delta State (Post Primary Education Board – PPEB, 2024). The study's sample was 237 which comprised 102 male and 135 female SS II Economics students in intact classes from four (4) selected public secondary schools in Oshimili South Local Government Area of Delta State. The sample was considered adequate to ensure stable estimation for group comparisons (male and female) and regression with an interaction effect. Intact classes were crucial for maintaining the natural classroom environment and minimizing disruption to the educational process. The sample of the study were selected using multi-stage sampling technique which combined purposive sampling with convenience sampling at different stages.

At stage 1, purposive sampling method was used to select four (4) specific public secondary schools based on predefined criteria of accessibility, willingness to participate, representation of the Local Government Area. That is, four (4) public secondary schools were purposively selected out of the 11 public secondary schools in the study area as at the conduct of this study. At this stage, the researchers ensured that schools that could facilitate the research were included. At stage 2, all students from intact SS II Economics classes within those selected schools were included in the study using convenience sampling technique. This approach was chosen to minimize disruption to the school's timetable and to maintain the natural classroom environment, thereby enhancing the ecological validity of the study. An intact class is a pre-existing group of students who are already together for their Economics lessons. All students within these selected intact classes who provided informed consent/assent constituted the sample. The multistage sampling technique is deemed suitable due to the practical

constraints of conducting research in educational settings and the emphasis on studying students within their natural learning groups. Two instruments were used for data collection in the study namely; the Test Anxiety Scale (TAS) which was adapted and modified by the researcher, and the Economics Achievement Test (EAT) developed by the researcher. The TAS measured the level of test anxiety among the SS II Economics students, while the EAT assessed their academic achievement in Economics. The instruments were designed in line with the objectives of the study. The Test Anxiety Inventory (TAI) was originally developed by Spielberger (1980) as a 20-item self-report measure designed to assess test-related anxiety in secondary school and university students. It contains two subscales: Worry (cognitive concerns about test performance) and Emotionality (physiological and affective symptoms). The original TAI is not culturally suitable for the Nigerian context. To ensure cultural adaptation, Oladimeji (2005) re-validated Spielberger's TAI for Nigerian students which was adopted in this study. The adapted TAI retained the 20 items with two subscales (Worry and Emotionality) used to measure the level of test anxiety experienced by male and female SSII Economics students. The re-validated Test Anxiety Inventory consisted of 20 items on 4-point modified Likert scale (1 = Almost Never, 2 = Sometimes, 3 = Often, and 4 = Almost Always) to assess the frequency and intensity of test anxiety symptoms. However, item 1 is scored in reverse order. The total obtainable score was 80 implying a high level of anxiety while 20 is the lowest score indicating low level of test anxiety. The TAI had two subscales: Worry (TAI-W) and Emotionality (TAI-E). The Worry sub-scale contains eight (8) items (1-8); item 9-16 assess emotionality assesses both worry and emotionality components of test anxiety while TAI-T comprises item 1-20 which assess the total anxiety. Each item was typically rated on a Likert-type scale, and responses were aggregated according to a clear scoring rubric to yield a quantitative score for each student. This quantitative score served as the measure of test anxiety for comparative and correlational analyses. Students with total anxiety scores ranging between 20 – 40 were categorized as low anxiety, 41–59 as moderate or average anxiety, and 60–80 were categorized as high anxiety level. The TAI was scored dichotomously.

The second research instrument for data collection in this study was Economics Achievement Test (EAT) designed by the researchers to measure students' achievement in the selected topics in the senior secondary I and II Economics curriculum. The items in the EAT were carefully developed to cover the relevant curriculum for Senior Secondary I and II Economics in Delta State in the 2024/2025 academic session, ensuring content validity. The EAT was a 40-item multiple-choice test format that provided a consistent and objective measure of students' knowledge and understanding of Economics concepts. The multiple-choice items were one-best-answer type having 4-response options ranging from A-D of which one option is the key (factually correct answer) while the remaining three options are the distractors. The keys were distributed across the 4-options in a balanced form to avert guessing. The distractors were made plausible but incorrect to effectively discriminate testee into different ability groups. Any correct response was awarded 1 mark each and 0 mark for any wrong response. Thus, the EAT was marked on a scale of 0 to 40 implying

that the maximum score was 40 marks while the lowest score was 0 (zero). Hence, students who scored well above average 27 – 40 demonstrated strong understanding and mastery of the subject and categorized as high achievers. Students who scored 14 –26 showed moderate or average understanding of the subject and all called average achievers, while students whose scores were between 0 – 13 showed poor understanding of the subject and need additional support for improvement were categorized as low achievers. To ensure valid comparison of achievement and anxiety scores between male and female student groups, accurate and consistent recording of participants was collected by requesting them to insert a tick in +the box in front of their sexes on the TAI and EAT during administration. The constructed Economics Achievement Test (EAT) was validated by three (3) experts namely; an experienced Economics teacher in a public secondary school in the area of the study, curriculum developer, and a specialist in educational measurement and evaluation in Federal College of Education (Technical) Asaba, Delta State. They reviewed the test items to ensure they accurately reflect the Senior Secondary I and II Economics curriculum and cover the relevant learning objectives. Additionally, the specialists assessed the clarity, relevance, and appropriateness of each item in the EAT. The test construction was guided with a table of specifications to ensure that the test adequately samples the domain of knowledge and skills it intended to measure. The draft copy of the EAT also underwent a review for face validity by a small group of SS II Economics students to ensure that the questions were understandable, unambiguous, and appear to measure what they are supposed to measure from the students' perspective. The adopted Test Anxiety Inventory from Oladimeji (2005) was evaluated for construct, convergent, discriminant and concurrent validity during the adaptation process. Similar to the achievement test, if a new or significantly adopted TAI was re-evaluated by two experts; one in the field of educational psychology, and the other in educational research who reviewed the items in the TAI to ensure they comprehensively cover the domain of test anxiety and are relevant to the target population of senior secondary school II Economics students.

The 40 Economics Achievement Test (EAT) was administered to 25 senior school students during the pilot study to determine its internal consistency. The Kuder-Richardson Formula 20 (KR-20) for dichotomously (correct or incorrect) scored items was used for data analysis. The 25 SS II Economics students used for pilot study were not part of the main study sample. Hence, Cronbach's Alpha (KR-20 equivalent) yielded a coefficient of 0.87 which indicating a high level of internal consistency reliability. The obtained coefficient (r = 0.87) implied that the test items are consistently measuring the same construct, students' achievement in Economics and that the instrument is reliable for use in the main study. The Test Anxiety Inventory (TAI) was pilot-tested on 25 senior school students who were not part of the study but share similar characteristics with participants in the main study. Analysis using Cronbach's Alpha produced a reliability coefficient of 0.99, which indicated an excellent internal consistency. This suggested that the items in the scale reliably measured students' levels of test anxiety. The researchers obtained institutional ethical clearance, formal letters were sent to the principals of selected schools, seeking permission to conduct the study. Upon approval, meetings were scheduled with Economics

teachers and students to explain the purpose of the study. The validated Test Anxiety Inventory was administered to all participating students during a regular Economics class period. To ensure consistency and minimize bias, four (4) trained research assistants administered the instruments by providing clear, standardized instructions. Students were assured that their responses are confidential and would not affect their academic standing. Ample time of 30 minutes (½ hour) was allocated for completion of the TAI, and research assistants were available to clarify any questions without influencing responses. The Economics Achievement Test was administered following an interval of a week after the administration of the Test Anxiety Inventory. This was to prevent any carry-over effects from the anxiety assessment. The administration of EAT lasted for 1 hour (60 minutes). Th researchers prioritized minimal disruption to the school schedule. Information concerning students' sex was collected through a self-report section on the TAI and EAT to maintain focus and maintaining strict confidentiality and anonymity. Prior to data collection, stringent ethical protocols were observed. This included obtaining formal ethical approvals from all relevant educational authorities, such as the Delta State Ministry of Basic and Secondary Education and the principals of the participating secondary schools. Furthermore, informed consent was secured from the parents or legal guardians of all participating students, clearly outlining the study's purpose, procedures, potential risks and benefits, and assurances of confidentiality and voluntary participation. Assent was obtained directly from the students themselves, ensuring their willingness to take part in the study. Participants were informed of their right to withdraw from the study at any point without penalty. Data collected were meticulously checked for completeness and accuracy. Quantitative data from the Test Anxiety Inventory and Economics Achievement Test scores were coded numerically. The test anxiety scores were aggregated according to the specific scoring rubric of the chosen scale. Academic achievement scores were recorded as raw scores. Gender was coded as a dichotomous variable (0 for male, 1 for female) to facilitate statistical analysis. All coded data were then entered into Statistical Package for the Social Sciences (SPSS) software for subsequent analysis. Data entry was be double-checked by a second researcher to minimize errors.

Data collected were analyzed using descriptive statistics of mean and standard deviation achievement scores to answer research question one (1) and two (2) of the study. However, the means and standard deviations of the Economics achievement scores were calculated separately for the male and female student groups. These statistics provided a clear summary of the central tendency and variability of academic achievement within each gender group. Similarly, means and standard deviations were computed for the test anxiety scores, separately for male and female student groups for research questions three (3) and four (4), offering insights into the average levels and spread of test anxiety within each gender category. Independent samples t-test was employed to test hypothesis 1 and 2 which is ideal for comparing the means of two independent groups (male vs. female students) on a continuous dependent variable (Economics achievement scores) to determine if any observed difference in mean achievement between sexes is statistically significant or likely due to random sampling variation. Prior to conducting the t-test, assumptions such as normality of data distribution

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and homogeneity of variances using (Levene's test) were checked before interpreting the test results. Hypothesis 3 was tested using a Two-Way Analysis of Variance (ANOVA**)**. This statistical technique is appropriate for examining the main effects of two independent categorical variables (gender and test anxiety) on a continuous dependent variable (academic achievement), as well as their interaction effect. For the purpose of ANOVA, test anxiety scores, which are initially continuous, was categorized into distinct groups of low, medium, and high-test anxiety based on cut-off points of 20-39, 40-59, and 60-80 score distribution respectively. The Two-Way ANOVA revealed if sex, test anxiety, or the combination of both (interaction) significantly influences academic achievement in Economics. The significance level for all inferential statistical tests was set at an alpha level of .05, meaning that a p-value less than 0.05 were considered statistically significant.

Results

Research Question One: What are the mean achievement scores of male students in Economics?

Table 1: Summary of Mean Achievement Scores of Male Students in Economics

Variable	N	Minimum Score	Maximum Score	Mean ($\bar{X}$)	Standard Deviation (SD)
Achievement Scores (Male)	102	0	40	23.15	10.47

The results in Table 1 show that male students (N = 102) obtained achievement scores ranging from 0 to 40, with a mean score of 23.15 and a standard deviation of 10.47. This indicates that, on average, the male students performed at a moderate level in Economics, though the relatively high standard deviation score (SD = 10.47) suggests some variability in their performance. In other words, while some male students achieved high scores, others performed considerably lower, pointing to differences in individual understanding or engagement with the subject.

Research Question Two: What are the mean achievement scores of female students in Economics?

Table 2: Summary of Mean Achievement Scores of Female Students in Economics

Variable	N	Minimum Score	Maximum Score	Mean ($\bar{X}$)	Standard Deviation (SD)
Achievement Scores (Female)	135	0	40	23.75	8.32

As shown in Table 2, female students (N = 135) recorded achievement scores between 0 and 40, with a mean of 23.75 and a standard deviation of 8.32. The mean score (M = 23.73) indicates a slightly higher average performance among female students compared to their male counterparts. The smaller standard deviation also suggests that female students' achievement scores

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were more consistent, implying a more uniform level of performance within the group.

Research Question Three: What are the mean test anxiety scores of male students in Economics?

Table 3: Summary of Mean Test Anxiety Scores of Male Students in Economics

Variable	N	Minimum Score	Maximum Score	Mean ($\bar{X}$)	Standard Deviation (SD)
Test Anxiety Scores (Male)	102	20	80	48.96	14.21

Table 3 reveals that male students had test anxiety scores ranging from 20 to 80, with a mean of 48.96 and a standard deviation of 14.21. This shows that, on average, male students experienced a moderate level of test anxiety. The wide spread of scores (SD = 14.21) suggests individual differences in how anxiety affected male students some managing it well, while others experienced higher levels that could potentially interfere with their academic performance.

Research Question Four: What are the mean test anxiety scores of female students in Economics?

Table 4: Summary of Mean Test Anxiety Scores of Female Students in Economics

Variable	N	Minimum Score	Maximum Score	Mean ($\bar{X}$)	Standard Deviation (SD)
Test Anxiety Scores (Female)	135	20	50	50.48	13.73

From Table 4, the test anxiety scores of female students ranged between 20 and 50, with a mean score of 50.48 and a standard deviation of 13.73. This suggests that female students, on average, had a slightly higher level of test anxiety than male students. Although the difference is small, the results may imply that female students tend to experience more anxiety in test situations, which could influence their learning and achievement outcomes in Economics.

Test of Hypotheses

Hypothesis One: The difference in the mean achievement scores of male and female students in Economics is not significant.

Table 5: Independent Sample t-test of no Significant Difference in the Mean Achievement Scores of Male and Female Students in Economics in Delta State

Group	N	Mean	Std. Dev.	Mean Difference	95% CIL	95% CIU	t-cal.	df	p-value	Alpha Level	Decision
Male	102	23.15	10.47	-.60109	-3.00	1.80	-.49	235	0.623	0.05	Not Sig.
Female	135	23.75	8.32								

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Table 5 presents the independent samples t-test comparing the mean achievement scores of male and female students. The analysis shows a mean difference of -0.601, with a t-calculated value of -0.49, p = 0.623, and a 95% confidence interval ranging from -3.00 to 1.80. Since the p-value (0.623) is greater than the 0.05 significance level, the result is not statistically significant. This means there is no significant difference between the achievement scores of male and female students in Economics. Therefore, both genders can be said to perform equally well when given similar learning conditions.

Hypothesis Two: The difference in the mean test anxiety scores of male and female students in Economics is not significant.

Table 6: Independent Samples t-test of no Significant Difference in the Mean Test Anxiety Scores of Male and Female Students in Economics in Delta State

Group	N	Mean	Std. Dev.	Mean Difference	95% CIL	95% CIU	t-cal.	df	p-value	Alpha Level	Decision
Male	102	48.96	14.21								
				-1.521	-5.12	2.08	-.83	235	0.406	0.05	Not Sig.
Female	135	50.48	13.73								

In Table 6, the comparison of mean test anxiety scores between male and female students yielded a mean difference of -1.521, with t = -0.83, p = 0.406, and a 95% confidence interval between -5.12 and 2.08. The p-value (0.406) exceeds 0.05, indicating no significant difference between the test anxiety levels of male and female students. This suggests that both male and female students experience similar levels of test anxiety in Economics, implying that gender may not play a major role in determining test-related emotional responses among the students.

Hypothesis Three: The interaction effect between sex and achievement scores of students with respect to test anxiety is not significant

Table 7: Summary of Two-Way ANOVA on Students' Achievement by Gender and Test Anxiety Level

Source of Variation	Sum of Squares (SS)	df	Mean Square (MS)	F-value	Sig. (p)	Decision
Gender	99.421	1	99.421	6.181	.014	Significant
Test Anxiety Level	16616.087	2	8308.044	516.476	.000	Significant
Gender × Anxiety Interaction	196.254	2	98.127	6.100	.003	Significant
Error (Within)	3715.872	231	16.086			
Total	151121.000	237				

Table 7 summarizes the results of a two-way ANOVA examining the influence of gender and test anxiety on students' achievement in Economics. The findings show that gender had a statistically significant effect on achievement (F = 6.181, p = .014), indicating that gender

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contributes to variations in student performance. Similarly, test anxiety level had a significant main effect (F = 516.476, p = .000), suggesting that the level of test anxiety strongly affects students' achievement in Economics. Moreover, the interaction effect between gender and test anxiety was also significant (F = 6.100, p = .003). This means that the combined influence of gender and anxiety level plays a role in determining how students perform, implying that anxiety affects male and female students differently.

Table 8: Post Hoc Multiple Comparisons (Bonferroni) for Test Anxiety Levels

(I) Anxiety Level	(J) Anxiety Level	Mean Difference (I–J)	Std. Error	Sig. (p)	Decision
Low Anxiety	Moderate Anxiety	9.9484*	.66107	.000	Significant
Low Anxiety	High Anxiety	23.9873*	.76288	.000	Significant
Moderate Anxiety	High Anxiety	14.0389*	.63270	.000	Significant

Table 8 presents post hoc (Bonferroni) comparisons among the three levels of test anxiety-low, moderate, and high. The results indicate significant mean differences across all comparisons: Low vs. Moderate Anxiety (Mean difference = 9.9484, p = .000); Low vs. High Anxiety (Mean difference = 23.9873, p = .000); and Moderate vs. High Anxiety (Mean difference = 14.0389, p = .000). These results confirm that students with lower anxiety levels achieved significantly higher scores than those with moderate or high anxiety levels. Conversely, high anxiety was associated with the lowest achievement scores, suggesting that excessive test anxiety has a detrimental effect on students' academic performance in Economics.

Discussion of Findings

The results of this study have provided valuable insights into how test anxiety and gender jointly influence the academic achievement of secondary school students in Economics in Delta State. The discussion of findings is organized according to the research questions and hypotheses that guided the study. The findings that emanated from research question one and two as well as hypothesis one of this study revealed that both male and female students achieved similar mean scores in Economics, indicating that gender did not significantly influence students' academic achievement in Economics. This finding suggests that when male and female students are given equal learning opportunities, exposure, and instructional support, they tend to perform similarly. A likely reason for this outcome is that both male and female students were exposed to similar learning environments, teaching methods, and instructional materials. In many secondary schools within Delta State, both genders are taught the same Economics curriculum under comparable classroom conditions. This uniform exposure may have minimized gender-based differences in performance. Additionally, Economics as a subject emphasizes analytical and conceptual reasoning, which are cognitive processes that are not gender-specific. Hence, the intellectual demands of the subject may favour neither males nor females but rather depend on the individual learner's study habits, motivation, and

interest. Furthermore, social and educational reforms in Nigeria promoting gender equity in education have narrowed the academic gap between boys and girls. Increased advocacy for girl-child education, parental encouragement, and equal classroom participation have created a level playing field. This finding is consistent with Goal Theory of Achievement, which postulates that students' performance is driven more by mastery goals and motivation than by gender. It also aligns with the findings of Owan (2020) and Rajasekaran (2016), who reported that gender differences do not significantly affect performance outcomes when students are exposed to similar instructional conditions. It also agrees with the assertions of Asuquo and Onasanya (2006) that achievement in school subjects is more related to students' learning engagement and motivation than to gender. This implies that both male and female students can perform optimally when instructional methods are inclusive and equitable.

The second finding of the study stemming from research questions three and four as well as hypothesis two indicated that both male and female students experience comparable levels of test anxiety showing no significant gender-based difference in anxiety levels. Several factors may explain this result. First, both male and female students operate under similar academic and social expectations. In contemporary Nigerian secondary schools, both genders face comparable pressure to perform well in examinations, secure future career opportunities, and meet parental expectations. Such uniformity in pressure levels tends to produce similar anxiety patterns. Second, the classroom culture in Delta State schools is largely competitive and examination-driven, making anxiety a shared experience across genders. Third, both male and female students have access to similar coping mechanisms such as group reading, teacher encouragement, and religious faith, all of which help moderate anxiety levels. Additionally, this similarity could stem from changing societal norms. Historically, female students were believed to be more emotionally expressive and anxious, but modern educational environments that emphasize equality and empowerment may have reduced that disparity. Both male and female students now perceive examinations as equally critical to their academic success, which levels their emotional responses.

This finding agrees with the work of Olatoye (2017), who found no significant difference in test anxiety between male and female students in science-related subjects. It also corroborates the findings of Ndirangu et al. (2009), which established that both genders experience similar anxiety levels before and during examinations. However, it contrasts with the findings of Shafiq et al. (2021) and Nazir et al. (2021), which observed higher anxiety levels among female students. The similarity in test anxiety levels found in this study may be attributed to the shared environmental and academic pressures that both genders experience in the Nigerian secondary school setting. It also resonates with Bandura's Social Cognitive Theory, which emphasizes that anxiety is a learned emotional reaction shaped by self-beliefs and environmental experiences rather than by inherent gender traits. Therefore, the study concludes that test anxiety is a universal academic experience affecting both genders similarly within the same educational setting. The finding of the study as revealed by hypothesis three showed that gender, test anxiety, and their interaction significantly influenced students'

achievement Economics, highlighting the interplay between emotional and demographic factors in learning outcomes. This finding suggests that students' achievement in Economics is shaped not only by gender and anxiety individually but also by how these two factors interact. In other words, anxiety influences male and female students differently in terms of their learning outcomes. For example, female students may internalize anxiety differently, which could affect concentration and self-confidence, while male students may exhibit outward signs of anxiety that impact test-taking behaviour. One possible explanation is that male and female students use different coping mechanisms when faced with anxiety-provoking academic tasks. Male students often externalize their anxiety through visible signs such as restlessness, avoidance, or even overconfidence, while female students are more likely to internalize anxiety, leading to excessive worry, self-doubt, or mental fatigue. These gendered coping differences may account for the varying influence of anxiety on achievement. Moreover, societal role expectations may play a part - males are often expected to display confidence and emotional stability, while females are culturally permitted to express vulnerability, which may influence how each reacts to examination pressure. The observed gender effect could also be linked to differences in self-efficacy - that is, the belief in one's ability to succeed in specific situations. Students with high self-efficacy are better at managing anxiety and performing well, while those with low self-efficacy are more likely to succumb to anxiety's negative effects. If male students tend to have slightly higher academic self-efficacy due to societal conditioning, their anxiety might translate into motivation rather than fear, whereas female students may perceive anxiety more as a threat than a challenge. This supports the theoretical basis of the State-Trait Anxiety Theory by Spielberger (1983), which posits that anxiety can vary by situation (state) and individual characteristics (trait), both of which influence performance outcomes. The significant main effect of test anxiety agrees with the results of previous studies (Akanazu & Okoli, 2019; Owan et al., 2020), which consistently found that high test anxiety negatively affects students' performance. It confirms that test anxiety is an emotional barrier that hinders effective recall, concentration, and task performance during tests.

Another finding of the study that emerged from post hoc (Bonferroni analysis on hypothesis three specified that students with low test anxiety outperformed those with higher anxiety levels. This finding underscores the inverse relationship between test anxiety and academic achievement, as test anxiety increases, performance tends to decrease. The likely reason for this negative relationship is that excessive test anxiety interferes with cognitive processes essential for learning and performance. High-anxious students often experience cognitive interference, where their attention shifts from task-related thoughts to self-defeating worries such as fear of failure or negative judgment. These intrusive thoughts reduce working memory capacity, making it difficult to recall information or think clearly during examinations. Additionally, heightened physiological arousal such as rapid heartbeat, sweating, or trembling can further disrupt concentration and reasoning. On the other hand, students with moderate or low anxiety experience optimal levels of arousal that keep them alert, focused, and motivated to perform effectively. Another likely factor is that students with lower anxiety often possess better study habits,

preparation skills, and confidence, which make them more psychologically ready for examinations. In contrast, students with high anxiety may procrastinate, overthink, or rely on last-minute cramming, leading to fatigue and poor performance. The examination culture in Nigeria, where grades determine academic progression and social recognition, may also amplify anxiety for some students, especially those with a strong fear of failure or perfectionistic tendencies. This result is consistent with the findings of Cassady and Johnson (2012) and Hancock (2001), who found that students with high test anxiety performed poorly and were less motivated to learn. It also echoes the empirical findings of Syokwaa et al. (2014), which established that high test anxiety interferes with academic focus and productivity. The present study, therefore, confirms that emotional stability and confidence play crucial roles in students' ability to perform well in evaluative situations such as tests and examinations. Overall, the study showed that while gender alone does not significantly influence achievement or test anxiety, test anxiety itself exerts a powerful influence on students' academic outcomes. Both male and female students experience test anxiety, but their emotional responses and coping mechanisms differ subtly. Students who can regulate their anxiety tend to perform better, while those who experience intense fear, worry, or self-doubt tend to underperform. These findings indicate the need for teachers, counsellors and parents to recognize anxiety as a significant emotional factor in learning and to help students develop healthy strategies for managing it.

Conclusion

The findings of this study revealed that while gender alone may not significantly predict students' achievement in Economics, test anxiety remains a strong determinant of academic success. Students who experience high levels of anxiety tend to underperform, regardless of gender. The study thus concluded that reducing test anxiety can enhance academic performance among secondary school students. Furthermore, both psychological and pedagogical interventions are needed to help learners develop positive test attitudes and emotional resilience.

Recommendations

Based on the findings and conclusions, the following recommendations were made:

1. School counsellors should implement regular test anxiety management programmes such as relaxation techniques, mindfulness, and positive self-talk sessions for students.
2. Teachers should create supportive and non-threatening assessment environments that encourage confidence rather than fear.
3. Curriculum planners should incorporate test-taking skills and emotional intelligence training into the secondary school curriculum.
4. Parents should provide emotional support and avoid imposing unrealistic expectations that may heighten anxiety.
5. School administrators should organize periodic seminars on coping with examination stress and maintaining psychological well-being.

Contribution to Knowledge

This study contributed to knowledge by providing empirical evidence on the interaction effect between gender and test anxiety in predicting academic achievement in Economics. This study also contributed to existing body of knowledge by demonstrating that test anxiety is a more powerful

predictor of achievement than gender among secondary school students. The study also offered practical strategies for managing test anxiety within the Nigerian secondary education context

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