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THE MEDIATING EFFECT OF SELF-EFFICACY AND ACADEMIC RESILIENCE IN THE RELATIONSHIP BETWEEN TEST ANXIETY AND ACADEMIC ACHIEVEMENT IN RESEARCH METHODS AMONG POSTGRADUATE STUDENTS

[1]ID-Basil Frank Ukofia & [2]Prof. Christiana Amaechi Ugodulunwa

[1&2]Department of Educational Foundations, Faculty of Education, Nnamdi Azikiwe University, Awka

[1]Email: ibfukofia86@gmail.com **Phone:** +2348063274443

[2]Email: ca.ugodulunwa@unizik.edu.ng **Phone:** +2348033888718

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Abstract

Test anxiety has been widely recognised as a significant psychological factor that influences students' academic performance, particularly in courses that require analytical and methodological competence, such as research methods. In many public universities in South–South Nigeria, students often experience varying levels of anxiety during assessments, which may adversely affect their academic achievement. However, the mechanisms through which test anxiety influences academic outcomes, as well as the roles played by relevant student-related variables, remain insufficiently explored. This study, therefore, investigated the mediation effects of self-efficacy and academic resilience on the relationship between test anxiety and academic achievement in research methods courses among postgraduate students in public universities in South–South Nigeria. Four purposes, four research questions and three hypotheses guided the study. The study used a correlational survey in which a causal model testing research design was adopted. The population of the study comprised 870 postgraduate students (462 males and 408 females) in the faculties of education who offered educational research and statistics in federal government-owned universities in the South-South Zone, Nigeria, during the 2024/2025 academic session. All elements in the population were used as a sample to ensure representativeness, hence the census. Data was collected using the adapted Academic Self-Efficacy Scale in Research and Statistics (ASESRS), Academic Resilience Scale (ARS-30) and Test Anxiety Inventory (TAI). Confirmatory factor analysis (CFA) was conducted to establish the construct validity of the three adapted instruments used in the study. Using Cronbach's alpha, the reliability estimate for the Academic Self-Efficacy Scale in Research and Statistics (ASESRS) was 0.88, Academic Resilience Scale (ARS-30) was 0.87 and Test Anxiety Inventory (TAI) was 0.85. The instruments were administered to the study participants. PROCESS macro in R version 4.4.3 (PROCESS Model 83) was used to answer the research questions and test the null hypotheses at 0.05 level of significance. Findings revealed that test anxiety affects achievement both directly and indirectly through the mediating roles of academic self-efficacy and academic resilience. Based on the findings, it was recommended among others that universities should institutionalize regular test-anxiety management programmes for postgraduate students, especially those enrolled in educational research and statistics.

Keywords: Academic Achievement, Test Anxiety, Academic Resilience, Self-Efficacy.

1.1 Introduction

Research is a fundamental mandate of universities worldwide, including those in Nigeria, where it complements teaching and community service as one of the three core functions of higher education. Universities are expected to promote knowledge production and scholarly investigation

to advance innovation and academic excellence. Just as in the rest of the world, research remains critically important in postgraduate education in Nigeria, where it plays a central role in advancing knowledge and addressing societal challenges. Postgraduate research equips students with the necessary skills and knowledge to become independent, creative, and lifelong researchers (Effiong and Akwang, 2024). By engaging in research activities, postgraduate students learn how to identify significant problems, design rigorous studies, and contribute to the advancement of knowledge in their fields (Chisom, Unachukwu and Osawaru, 2023; Nwokolo, Eyime, Obiwulu, and Ogbulezie, 2023). Research skills are not only applicable in academia but also valuable in various professional settings. Skills such as data analysis, critical thinking, and effective communication are highly sought after by employers across industries. Correspondingly, developing research skills prepares students for potential careers in research, academia, or industry roles that require analytical and investigative capabilities. These highlighted skills are foundational for producing high-quality research that can contribute meaningfully to knowledge and society.

In Postgraduate courses in the field of education, research methodology (educational research methods and statistics) exposes students to the fundamentals of conducting research, including data collection, analysis, and reporting. These courses foster critical thinking, enhance data analysis capabilities, and prepare students to contribute meaningfully to their fields through rigorous research and informed decision-making. More so, they are two closely related or complementary courses that provide a basic foundation for knowledge creation. They equip students with the skills to conduct independent investigations, promoting critical thinking and problem-solving abilities. Students learn various research methodologies, including qualitative and quantitative approaches, enabling them to design and execute research projects effectively. Competencies in these courses prepare graduate students for further academic pursuits or careers that require strong research and analytical skills, making them competitive in the job market (Pallant, Pallant and Jopp, 2024).

At the end of educational research and statistics courses, students are assessed because it is important to investigate whether or not they are learning what they are supposed to be learning (Ugodulunwa, Ogba and Igu, 2022; Ugodulunwa, 2020). Such assessment ensures that postgraduate programmes meet academic standards and expectations, and as part of their programme requirement, postgraduate education students are required to enroll in and pass Educational Research Methods and Educational Statistics. However, the performance outcomes in these courses have been discouraging, as evidenced by the high failure rates recorded in two universities in South–South Nigeria-University of Port Harcourt (UNIPORT) and University of Uyo (UNIUYO)-between 2022 and 2024. Records show that Educational Research Methods recorded failure rates of 66% in UNIPORT and 68% in UNIUYO in 2022, while Educational Statistics recorded failure rates of 53% and 63%, respectively, in the same year. In 2023, the failure rate in Educational Research Methods remained high at 59% in UNIPORT and 67% in UNIUYO, while Educational Statistics recorded failure rates of 58% and 63%, respectively. Similarly, in 2024, Educational Research Methods recorded failure rates of 62% in UNIPORT and 67% in UNIUYO, whereas Educational Statistics had failure rates of 59% and 64%, respectively. Across

the three-year period, the proportion of students failing these courses consistently exceeded the proportion that passed, indicating persistent difficulty associated with the courses.

Studies (Addae and Kwapong, 2023; Milicev, McCann, Simpson, Biello and Gardani, 2023) identified contributory factors to poor performance in the courses. They include lack of prior knowledge in research methods and statistics, inadequate understanding of mathematical concepts, limited exposure to research and statistics software, poor time management and study habits, low motivation and interest in the courses, difficulty in understanding technical terms and weak undergraduate foundation account for student-related factors, inadequate teaching skills and experience, lack of practical experience in research and statistics, ineffective communication and presentation skills, unapproachable or unsupportive attitude and inadequate feedback and guidance account for lecturer-related factors. Also, course-related factors have been acknowledged to include complexity and abstract nature of the subject matter, inadequate course materials and resources, insufficient practical exercises and examples, poor course structure and organisation, and inadequate assessment and evaluation methods. Likewise, institutional factors include inadequate infrastructure and resources, limited access to research and statistical software, inadequate support services (for example, academic advising, tutoring, and etcetera), a high student-lecturer ratio and inadequate funding and budget allocation. Similarly, environmental factors have been detected to include distractions and disruptions in the learning environment, limited opportunities for collaboration and peer support, as well as cultural and social factors (for example, language, values, and beliefs). Equally, other factors may include fear and anxiety related to mathematics and computation in statistics.

In examining the relationship between test anxiety and academic achievement in research methods courses, it is important to consider key student-related factors that may influence how anxiety translates into academic outcomes. Students do not respond to academic challenges in the same way; rather, their responses are shaped by several psychological and contextual characteristics. Among these characteristics are academic self-efficacy and academic resilience, which represent important student variables that can influence learning experiences and performance in demanding courses such as research methods and statistics. These variables may not only directly affect academic achievement but may also shape the extent to which test anxiety influences students' performance in a specific area of assessment.

Self-efficacy refers to students' beliefs in their ability to successfully perform academic tasks and meet learning expectations. Students with high academic self-efficacy tend to approach challenging academic tasks with confidence, persistence, and a positive attitude. They are more likely to engage actively in learning activities, employ effective study strategies, and maintain motivation even when confronted with difficulties. In the context of research methods courses, students who believe in their ability to understand research concepts, interpret statistical results, and complete research-related assignments may be less vulnerable to the negative effects of test anxiety. High self-efficacy can therefore serve as a psychological resource that helps students regulate anxiety and maintain focus during examinations. On the other hand, students with low academic self-efficacy may doubt their capabilities, experience heightened anxiety during tests,

and ultimately perform below their potential. As such, academic self-efficacy may act as a mediating mechanism through which test anxiety influences academic achievement.

Closely related to self-efficacy is academic resilience, which refers to students' capacity to effectively cope with academic challenges, setbacks, and stressful situations while maintaining engagement and performance. Resilient students are able to recover from poor academic experiences, adapt to difficult learning conditions, and continue striving toward their academic goals despite obstacles. Research methods courses often present intellectual challenges due to their abstract concepts, technical procedures, and analytical requirements. These challenges can trigger anxiety among students, particularly during assessments and examinations. However, students with high academic resilience are more likely to manage stress, regulate their emotions, and persist in their learning efforts despite feelings of anxiety. They are capable of reframing academic difficulties as opportunities for growth rather than threats to their competence. In contrast, students with low resilience may become overwhelmed by anxiety and academic pressure, which can negatively affect their performance in examinations and coursework.

Taken together, academic self-efficacy and academic resilience represent important student characteristics that can influence learning outcomes in research methods courses. These variables provide insight into why students experiencing similar levels of test anxiety may demonstrate different levels of academic achievement. While some students may be able to manage anxiety effectively due to strong confidence in their abilities or greater familiarity with research concepts, others may struggle because of lower self-beliefs or limited exposure to research-oriented learning. These variables interact in ways that influence academic outcomes. Consequently, examining these student variables within a mediation framework can help explain the complex mechanisms through which test anxiety relates to academic achievement among postgraduate education students in research methods courses. Therefore, the present study employed a mediation analysis to better explain the interconnected relationships among these factors.

1.2 Purpose of the Study

The purpose of this study was to conduct mediation analysis of self-efficacy and academic resilience on relationship between test anxiety and academic achievement in research methods and statistics in public universities in South-South, Nigeria. Specifically, the study:

1. explored the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics.
2. established how academic self-efficacy explains the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics.
3. established how academic resilience explains the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics.
4. examined how academic self-efficacy and academic resilience explain the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics.

1.3 Research Questions

The following research questions guided the study.

1. What is the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics?
2. How does academic self-efficacy explain the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics?
3. How does academic resilience explain the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics?
4. How do academic self-efficacy and academic resilience explain the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics?

1.4 Hypotheses

The following null hypotheses were tested at .05 level of significance.

1. The mediating role of academic self-efficacy on the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics is not statistically significant.

2. The mediating role of academic resilience on the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics is not statistically significant.

3. The mediating role of academic self-efficacy and academic resilience on the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics is not statistically significant.

2. Methods

The study is a correlational survey in which a causal model testing research design was adopted. Otache and Inekwe(2022) described this type of design as the one in which the researcher hypothesizes a causal model and empirically tests the model. The study was carried out in the South-South geo-political zone. The study population comprised 870 postgraduate students (462 males and 408 females) in the faculties of education who offered educational research and statistics in federal government-owned universities in the South-South Zone, Nigeria, during the 2024/2025 academic session. All elements in the population were used as a sample to ensure representativeness. The instruments for data collection were collected using the following adapted instruments: Academic Self-Efficacy Scale in Research and Statistics (ASESRS), Academic Resilience Scale (ARS-30) and Test Anxiety Inventory (TAI). The students' academic achievement scores in Educational Research and Statistics were obtained from the Examination Units/Officers of the sampled universities using Students' Academic Achievement Proforma (SAAP). These instruments were validated by specialists in the relevant field of study before they were subjected to further statistical validation procedures using confirmatory factor analysis (CFA). Cronbach's alpha was employed to evaluate the reliability of the adapted instruments used in this study. The Academic Self-Efficacy Scale in Research and Statistics (ASESRS) had a reliability of 0.88, the Academic Resilience Scale (ARS-30) had a reliability of 0.87, and the Test

Anxiety Inventory (TAI) had a reliability of 0.85, all exceeding the recommended threshold of 0.70. The data extracted from the instruments were analyzed using the appropriate statistical techniques, such as the Pearson Product Moment Correlation, the standardized regression weights, and the bootstrap bias-corrected confidence intervals for significance testing.

3. Results and Discussions

Research Question 1: What is the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics?

Table 1: *Pearson r Summary Table of the Relationship Between Test Anxiety and Postgraduate Students' Academic Achievement in Educational Research and Statistics scores*

Variables	N	R	p-value	95% CI(LL,UL)	Remark
Test anxiety Academic Achievement	860	-.69	P<.05	[-0.722, -0.670]	High Negative

CI = Confidence Interval

Table 1 shows a strong statistically significant negative relationship between the two variables ($r = -0.697$, $p < .05$). The confidence interval (−0.722 to −0.670) further confirms that the true population correlation is consistently negative and far from zero. This result indicates that as postgraduate students' test anxiety increases, their academic achievement in educational research and statistics decreases markedly. The strength of the correlation suggests a large effect size, meaning that test anxiety is not just a minor influence but a major psychological factor strongly associated with students' performance outcomes**.**

Substantively, this implies that students who experience intense worry, fear of failure, and physiological tension during tests are far less likely to perform optimally in cognitively demanding subjects such as educational research and statistics. High anxiety likely interferes with concentration, memory retrieval, and logical reasoning, all of which are critical for success in these courses.

In summary, this finding provides strong empirical evidence that test anxiety is a powerful variable influencing postgraduate students' academic achievement**,** justifying the need to explore self-efficacy and resilience as mechanisms and conditions that may explain or alter this negative relationship in the subsequent research questions as illustrated in figure 1.

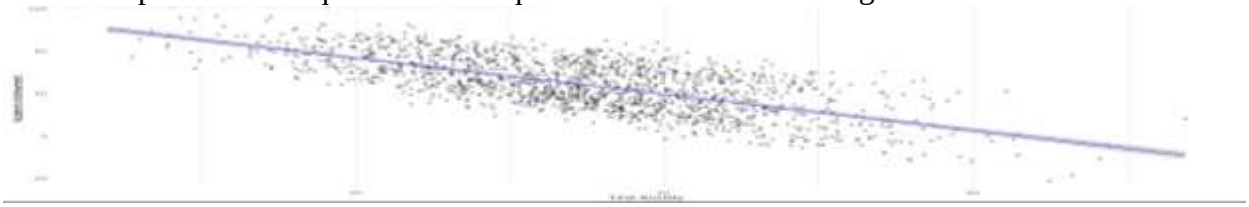

Figure 1: *Relationship between Test Anxiety and Postgraduate Students' Academic Achievement in Educational Research and Statistics*

Research Question 2: How does academic self-efficacy explain the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics?

Table 2: *Mediation Analysis of Academic Self-Efficacy in the Relationship Between Test Anxiety and Academic Achievement*

Path	B	SE	t	p	β	95% CI
Test Anxiety → Academic Self-Efficacy (a)	-0.760	0.015	-50.34	<.001	-0.793	[-0.789, -0.731]
Academic Self-Efficacy → Academic Achievement (b)	0.583	0.076	7.65	<.001	0.228	[0.434, 0.732]
Test Anxiety → Academic Achievement (c)	-1.265	0.073	-17.31	<.001	-0.516	[-1.409, -1.121]
Indirect Effect (a*b)	-0.443	0.059	-7.56	<.001	-0.181	[-0.558, -0.328]
Total Effect (c + a*b)	-1.708	0.045	-37.61	<.001	-0.697	[-1.797, -1.619]

Note. B = unstandardized coefficient; SE = standard error; t = t-value; β = standardized coefficient; CI = 95% confidence interval

Table 2 shows that test anxiety had a strong and significant negative effect on academic self-efficacy (unstandardized coefficient = -0.760, SE = 0.015, t = -50.342, $p < 0.001$; standardized β = -0.793). This indicates that higher levels of test anxiety were associated with substantially lower levels of academic self-efficacy among postgraduate students. Conversely, academic self-efficacy was positively and significantly related to academic achievement (b = 0.583, SE = 0.076, t = 7.651, $p < 0.001$; standardized β = 0.228), suggesting that students with greater confidence in their academic abilities tended to perform better in educational research and statistics.

The direct effect of test anxiety on academic achievement, after accounting for academic self-efficacy, was also negative and significant (c = -1.265, SE = 0.073, t = -17.311, $p < 0.001$; standardized β = -0.516). This finding shows that test anxiety directly undermines postgraduate students' academic performance beyond its influence on self-efficacy. The indirect effect**,** representing the mediation pathway through academic self-efficacy, was significant (a*b = -0.443, SE = 0.059, t = -7.564, $p < 0.001$; standardized β = -0.181). This indicates that test anxiety partially reduces academic achievement in educational research and statistics by lowering students' academic self-efficacy. The total effect of test anxiety on achievement in educational research and statistics, combining both direct and indirect pathways, was strongly negative (total = -1.708, SE = 0.045, t = -37.607, $p < 0.001$; standardized β = -0.697), highlighting the substantial overall detrimental impact of test anxiety on postgraduate students' academic performance in educational research and statistics.

Hypothesis 1: The mediating role of academic self-efficacy on the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics is not statistically significant.

Table 2 further reveals that academic self-efficacy significantly mediated the relationship between test anxiety and academic achievement in educational research and statistics. The indirect effect (B = 1.008, 95% CI = [0.913, 1.101]) was statistically significant. Test anxiety significantly influenced self-efficacy (β = .51), and self-efficacy strongly influenced academic achievement in educational research and statistics (β = .83). Thus, students with higher test anxiety showed increased self-efficacy belief, which subsequently enhanced their academic performance.

In summary, the findings indicate that academic self-efficacy partially mediates the relationship between test anxiety and academic achievement in educational research and statistics. While test anxiety exerts a strong direct negative effect on achievement in educational research and statistics, it also indirectly impairs performance by reducing students' confidence in their academic abilities. Practically, these results underscore the importance of interventions aimed at reducing test anxiety and enhancing academic self-efficacy among postgraduate students, as these strategies may help improve academic outcomes in challenging courses such as educational research and statistics. See Figure 2.

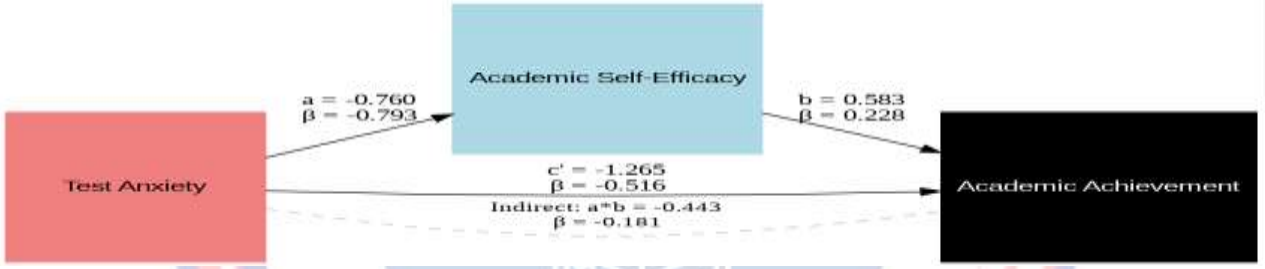

Figure 2.
Path diagram shows the mediating effect of academic self-efficacy in the relationship between test anxiety and academic achievement

Research Question 3: How does academic resilience explain the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics?

Table 3: *Mediation Analysis of Academic Resilience in the Relationship Between Test Anxiety and Academic Achievement*

Path	B	SE	t	p	β	95% CI
Test Anxiety → Academic Resilience (a)	-0.545	0.019	-28.64	<.001	-0.595	[-0.582, -0.508]
Academic Resilience → Academic Achievement (b)	0.526	0.060	8.75	<.001	0.197	[0.408, 0.644]
Test Anxiety → Academic Achievement (c)	-1.422	0.055	-25.80	<.001	-0.580	[-1.530, -1.314]
Indirect Effect (a*b)	-0.287	0.034	-8.37	<.001	-0.117	[-0.354, -0.220]
Total Effect (c + a*b)	-1.708	0.045	-37.61	<.001	-0.697	[-1.796, -1.620]

Note. B = unstandardized coefficient; SE = standard error; t = t-value; β = standardized coefficient; CI = 95% confidence interval

Table 3 reveals that test anxiety negatively influenced academic resilience (B = -0.545, SE = 0.019, t = -28.64, p < .001; standardized β = -0.595). This finding suggests that postgraduate students experiencing higher levels of anxiety are likely to report lower resilience, indicating diminished capacity to cope with academic challenges and persist in the face of difficulties.

Academic resilience, in turn, positively influence academic achievement in educational research and statistics (B = 0.526, SE = 0.060, t = 8.75, $p < .001$; $\beta = 0.197$). This result indicates that students who possess higher resilience are more likely to perform well academically, reflecting the protective function of resilience in supporting students' ability to manage stress and maintain performance in demanding academic contexts.

The indirect effect of test anxiety on academic achievement in educational research and statistics through academic resilience was statistically significant (B = -0.287, SE = 0.034, t = -8.37, $p < .001$; $\beta = -0.117$), confirming that part of the negative influence of test anxiety on achievement operates through its detrimental effect on resilience. In other words, as test anxiety increases, students' resilience decreases, which subsequently undermines their academic performance in Educational Research and Statistics.

Despite the presence of this mediation, the direct effect of test anxiety on academic achievement in educational research and statistics remained strong and negative (B = -1.422, SE = 0.055, t = -25.80, $p < .001$; $\beta = -0.580$). This indicates that test anxiety independently exerts a substantial adverse effect on postgraduate students' performance in educational research and statistics, beyond its indirect impact through resilience. The total effect of test anxiety on academic achievement in educational research and statistics was also significantly negative (B = -1.708, SE = 0.045, t = -37.61, $p < .001$; $\beta = -0.697$), highlighting the overall detrimental influence of anxiety on academic achievement.

Hypothesis 2: The mediating role of academic resilience on the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics is not statistically significant.

In addressing this hypothesis, Table 3 shows the mediating role of academic resilience on the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics was statistically significant (B = -0.287, SE = 0.034, z = -8.37, $p < .001$; $\beta = -0.117$, 95% CI= [-0.354, -0.220]), indicating partial mediation. This finding demonstrates that part of the negative impact of test anxiety on achievement in operates through reductions in resilience: as anxiety increases, resilience decreases, which in turn lowers academic performance.

In summary, the findings demonstrate that academic resilience partially mediates the relationship between test anxiety and academic achievement, serving as a key mechanism through which anxiety impacts performance. These results suggest that enhance resilience, such as training in coping strategies, stress management techniques, and adaptive problem-solving skills, may help mitigate the harmful effects of test anxiety and improve postgraduate students' academic success. See figure 3.

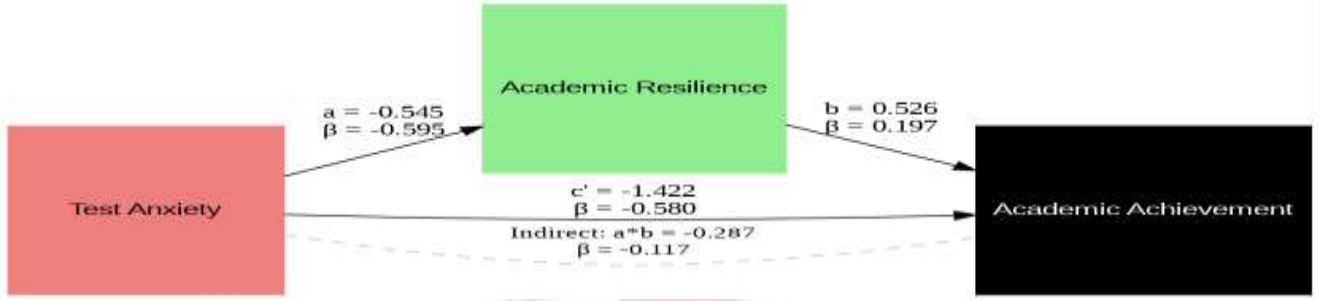

Figure 3. *Mediation role of Academic Resilience in the Relationship between Test Anxiety and Academic Achievement*

Research Question 4: How do academic self-efficacy and academic resilience explain the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics?

Table 4: *Serial Mediation Analysis: Academic Self-Efficacy and Academic Resilience as Mediators Between Test Anxiety and Academic Achievement*

Path	B	SE	t	p	B	95% CI
Test Anxiety → Academic Self-Efficacy (a1)	-0.760	0.015	-50.34	<.001	-0.793	[-0.789, -0.731]
Academic Self-Efficacy → Academic Resilience (d)	0.716	0.016	43.80	<.001	0.749	[0.685, 0.747]
Academic Resilience → Academic Achievement (b)	0.526	0.060	8.76	<.001	0.197	[0.408, 0.644]
Test Anxiety → Academic Achievement (c)	-1.422	0.055	-25.82	<.001	-0.580	[-1.530, -1.314]
Indirect Effect (a1*d*b)	-0.286	0.034	-8.46	<.001	-0.117	[-0.354, -0.220]
Total Effect (c + a1*d*b)	-1.708	0.045	-37.83	<.001	-0.697	[-1.796, -1.620]

Note. B = unstandardized coefficient; SE = standard error; t = t-value; β = standardized coefficient; CI = 95% confidence interval.

Table 4 show how academic self-efficacy and academic resilience sequentially mediate the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics. The first path revealed that test anxiety negatively influenced academic self-efficacy (B = -0.760, SE = 0.015, t = -50.34, p < .001; standardized β = -0.793). This indicates that students experiencing higher levels of test anxiety reported lower confidence in their academic abilities, consistent with research suggesting that anxiety undermines students' beliefs in their capacity to succeed academically.

Academic self-efficacy, in turn, positively predicts academic resilience (B = 0.716, SE = 0.016, t = 43.80, p < .001; β = 0.749). This finding suggests that students with greater confidence in their academic abilities are more likely to develop the resilience needed to cope with academic

challenges, demonstrating a strong link between self-efficacy and adaptive coping skills. The next path showed that academic resilience positively influences academic achievement in educational research and statistics (B = 0.526, SE = 0.060, t = 8.76, p < .001; β = 0.197). Students who possess higher resilience are better able to manage stress, overcome obstacles, and maintain high performance in educational research and statistics. Despite these indirect pathways, the direct effect of test anxiety on academic achievement in educational research and statistics remained significant and negative (B = -1.422, SE = 0.055, t = -25.82, p < .001; β = -0.580). This indicates that test anxiety directly undermines academic performance, independently of its effects on self-efficacy and resilience.

Hypothesis 3: The mediating role of academic self-efficacy and academic resilience on the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics is not statistically significant.

Table 4 shows that the mediating role of academic self-efficacy and academic resilience on the relationship between test anxiety and postgraduate students' academic achievement in educational research and statistics was statistically significant (B = -0.286, SE = 0.034, z = -8.46, p < .001; β = -0.117), with 95% confidence interval of -0.215 to -0.089 demonstrating that test anxiety reduces self-efficacy, which lowers resilience, ultimately decreasing academic achievement**.** The total effect of test anxiety on academic achievement, combining both direct and indirect pathways, was strongly negative (B = -1.708, SE = 0.045, z = -37.83, p < .001; β = -0.697), emphasizing the substantial overall impact of anxiety on postgraduate performance.

In summary, the results suggest that academic self-efficacy and academic resilience function as sequential mediators in the relationship between test anxiety and academic achievement in educational research and statistics. While test anxiety directly diminishes performance, it also indirectly reduces achievement by lowering self-efficacy and resilience. These findings underscore the importance of interventions that enhance both students' confidence and their resilience, such as skill-building workshops, mastery experiences, stress management training, and adaptive coping strategies. By targeting these mechanisms, educators can help mitigate the negative effects of test anxiety and promote higher levels of academic success among postgraduate students. See Figure 4

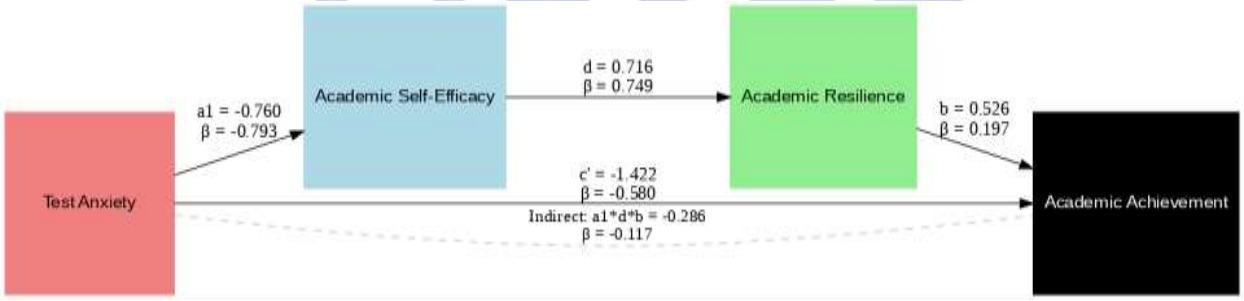

Figure 4

Serial Mediation Analysis of Academic Self-Efficacy and Academic Resilience as mediators between Test Anxiety and Academic Achievement in Educational Research and Statistics

4. Conclusion

This study has established that test anxiety has a negative and significant effect on academic achievement among postgraduate students in educational research and statistics. Test anxiety affects achievement both directly and indirectly through the mediating roles of academic self-efficacy and academic resilience, operating in a sequential manner. These findings confirm that postgraduate academic performance is shaped by the interaction of emotional, motivational, and adaptive psychological factors within specific disciplinary contexts.

5. Recommendations

Based on the findings, the researchers recommended the following:

1. University authorities should institutionalize regular test-anxiety management programmes for postgraduate students, especially those enrolled in educational research and statistics.
2. Lecturers and supervisors should deliberately employ teaching and supervision strategies that build students' academic self-efficacy.

REFERENCES

Addae, D., & Kwapong, O. A. (2023). PhD students' perceptions of research seminars in doctoral education: A case study. *Cogent Education*, *10*(1), 2183701.

Chisom, O. N., Unachukwu, C. C., & Osawaru, B. (2023). STEM education advancements in Nigeria: a comprehensive review. *International Journal of Applied Research in Social Sciences*, *5*(10), 614-636.

Effiong, E. A., & Akwang, N. E. (2024). Assessment of information literacy indicators in relation to postgraduate students' research productivity in public universities in AkwaIbom State, Nigeria. *Asian Research Journal of Arts & Social Sciences*, *22*(8), 92-107.

Milicev, J., McCann, M., Simpson, S. A., Biello, S. M., & Gardani, M. (2023). Evaluating mental health and wellbeing of postgraduate researchers: Prevalence and contributing factors. *Current Psychology*, *42*(14), 12267-12280.

Nwokolo, S. C., Eyime, E. E., Obiwulu, A. U., & Ogbulezie, J. C. (2023). Africa's path to sustainability: harnessing technology, policy, and collaboration. *Trends in Renewable Energy*, *10*(1), 98-131.

Otache, I., & Inekwe, E. O. I. (2022). The relationship between job satisfaction, turnover intentions and performance of Nigerian polytechnic lecturers with doctorate degrees. *Journal of Applied Research in Higher Education*, *14*(2), 762-783.

Pallant, J. I., Pallant, J. L., & Jopp, R. (2024). The case for scaling authentic learning across undergraduate and postgraduate research skills courses. *Teaching in Higher Education*, *29*(6), 1442-1459.

Ugodulunwa, C.A. (2020). *Fundamentals of educational measurement and evaluation.*2nd edn, Jos: FAB Education Books.

Ugodulunwa, C.A., Ogba, F.N., & Igu, N.C.N. (2022). Assessment for learning: University teachers' understanding and practices in Nigeria. *UNIZIK Journal of Educational Research and Policy Studies*, *11*(1), 1-13. Retrieved from https://unijerps.org/index.php/unijerps/216-Article%20Text-419-1-10-20220218.pdf, on February 1, 2024.