



## Work engagement and academic achievement in educational research and statistics. a mediation analysis of research resilience, research self-efficacy and research anxiety

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### Abstract

This study examined the relationship between work engagement and academic achievement among postgraduate students pursuing Educational Research and Statistics at Federal Universities in Southeast Nigeria, considering the mediating role of research resilience, research self-efficacy and research anxiety. Employing a model testing correlational design with 1,500 students in the population, eight hundred seventy-seven (877) as sample selected via stratified random sampling technique. Data were gathered using structured questionnaire and analyzed using Pearson correlation and causal modeling with bootstrapping techniques. The study found a significant moderate negative relation between work engagement and academic achievement ( $r = -.332, p < .001$ ), implying a stronger workplace engagement leads to lower academic performance in the said subject. It was also revealed that research resilience and research self-efficacy mediated the negative relation as the relationship between work engagement and these positive psychological variables was negative, hence, increased work engagement diminished them leading to a decrease in academic achievement. Research anxiety also mediated the relationship negatively as work engagement enhanced anxiety which decreased the academic performance. The combined indirect effect ( $\beta = -0.688, p < .001$ ) suggests that a chain mediation occurred, and a significant direct effect implied partial mediation. It was concluded that over-engagement in work has the capacity to deplete critical psychological resources necessary for excellence in research courses. University intervention programs need to be put in place to boost students' resilience, self-efficacy and alleviate research anxiety among postgraduate students combining work with academics.

**Keywords:** Work engagement, academic achievement, research resilience, research self-efficacy, research anxiety, causal modeling

### Introduction

Postgraduate education constitutes a vital phase in the system of higher learning designed to cultivate sophisticated research, analytical and critical thinking skills essential for academic, professional and societal progress (Adekoya & Okeke, 2021; Mensah & Appiah, 2022) <sup>[1]</sup>. Compared to undergraduate education where broad training is common, the focus is on an in-depth understanding of concepts, meticulous analysis of data and scholarly contributions to knowledge generation. Amongst several courses studied by post graduate students, Educational Research and Statistics is indispensable due to its central role as a bedrock for all scholarly pursuit in education. The course is an avenue through which students gain knowledge of statistical methods and tools for rigorous quantitative and analytical reasoning and evidence-based decision making (Olawale & Musa, 2023; Singh & Sharma, 2022) <sup>[15, 19]</sup>. A thorough mastery of statistical research and methods is indispensable for outstanding achievements in both academic and professional endeavors (Adeyemi & Adetunji, 2021; Chukwu & Eze, 2023) <sup>[2, 6, 8]</sup>.

Despite its significance, many postgraduate students still face challenges and struggle to achieve excellence in this area because of its intricate nature. Statistics is technical in nature, as many research methods and concepts are abstract; hence postgraduate students have often faced challenges in mastering it (Mahmoud & Hassan, 2022; Xu & Wang, 2023) <sup>[14, 24]</sup>. This challenge often translates to three research-related psychological factors namely, research anxiety, research self-efficacy and research resilience.

Research anxiety is related to tension, worry, apprehension and fear in the process of conducting research related tasks which can hinder learning process and efficiency (Mahmoud & Hassan, 2022; Salehi & Rostami, 2021) <sup>[14]</sup>. Research self-efficacy on the other hand, measures student's belief in their ability to successfully execute research-related tasks, ranging from methodological understanding, analytical and statistical execution and effective report writing (Pintrich & De Groot, 2022; Umar & Bello, 2023) <sup>[17, 21]</sup>. Finally, research resilience refers to students' ability to adapt, persist and bounce back from failure or setback encountered during research activities (Lee & Park, 2023; Fan & Zhang, 2023) <sup>[9, 13]</sup>. The three variables can significantly impact on academic achievement.

Added to this is work engagement which refers to a "positive, fulfilling, work-related psychological state of vigor, dedication, and absorption" (Schaufeli et al., 2006; Bakker & Demerouti, 2018) <sup>[4, 18]</sup>. It refers to the way students engaged in work, combining work engagement with academic pursuit is a relevant issue because postgraduate students in Nigerian Federal Universities are known to be engaged in professional work outside academic institutions simultaneously with their studies. They balance two major commitments thereby making time, energy and resource management a great challenge for postgraduate students engaging in research intensive course (Kim & Lee, 2022; Zhao, Lin & Guo, 2023) <sup>[11, 25]</sup>. It comprises of three components; Vigor which is a state of high energy, and mental resilience during work; Dedication which is a strong involvement, enthusiasm and sense of meaning in tasks;

Absorption is complete concentration on work in which people become so engrossed that time seems to fly (Fan & Zhang, 2023; Lara & Martin, 2023; Perez-Gonzalez & Sanchez, 2022) [9, 12, 16].

The consequence of engagement in work can be dual; while it has the tendency to build self-discipline, motivational levels and persistence, it could negatively impact on time, energy and attention that could have been channeled towards academic activities especially research related courses. Hence, engaging positively in work could result in negative research related outcomes and a subsequent impact on academic achievement in Educational Research and Statistics (Balogun & Adedayo, 2023; Ifeanyi & Obinna, 2024) [5].

Moreover, research-related variables mediate the impact of work engagement on academic achievement in Educational Research and Statistics among postgraduate students. Research resilience is the ability of student to face challenges and still emerge victorious (Adewale & Funsho, 2024; Fan & Zhang, 2023) [3, 9]. Research self-efficacy is a students' belief that they can be successful at various research-related tasks (Bandura, 1997; Tran & Nguyen, 2022; Umar & Bello, 2023) [20, 21]. Research anxiety refers to negative emotional reactions of students towards research tasks (Mahmoud & Hassan, 2022; Xu & Wang, 2023) [14, 24]. It seems limited research had examined how work engagement impact on the achievement of postgraduate students in Educational Research and Statistics through research-related mediating factors.

The theoretical underpinning of this research is grounded in Job Demands-Resources (JD-R) Model and Self-Regulated Learning Theory. The JD-R model propose that personal resource like work engagement can counter the demands placed upon students, therefore buffering the effects of these demands, leading to positive consequences like a better academic achievement (Bakker & Demerouti, 2018; Xanthopoulou et al., 2020) [4, 23]. Self-regulated learning theory describes self-regulated students as proactive in their learning. Students who possess better knowledge about their own learning, control their behaviors, thoughts, and motivations regarding learning effectively achieve good academic outcomes (Zimmerman, 2021; Pintrich & De Groot, 2022) [17, 26]. The integration of these models helps in establishing a causal chain of workplace engagement to students' academic performance through research-related variables.

The contemporary academic environment in Nigerian Federal Universities in Southeast Nigeria is more challenging. The challenge of poor research facilities and supervision and heavy lecture loads makes the challenge greater. (Eze & Onu, 2023; Udoh & Etuk, 2024) [8, 22]. Work engagement could possibly worsen the problem by intensifying negative factors such as research anxiety and diminishing positive resources like resilience and self-efficacy, and thus further deteriorate academic performance in the subject area.

Hence the need to find out the mechanism through which work engagement affects academic achievement through these mediating factors. In light of the above, this study investigates the causal modeling of work engagement on academic achievement in Educational Research and Statistics amongst postgraduate students in Nigerian Federal Universities in Southeast Nigeria and mediating effect of

research resilience, research self-efficacy and research anxiety among the students.

### Statement of the Problem

Academic achievement in Educational Research and Statistics is a critical requirement for postgraduate students, as it determines their capacity to conduct independent research, complete theses, and contribute meaningfully to academic scholarship. However, in Federal Universities in South-East Nigeria, many postgraduate students experience persistent difficulties in mastering research design, data analysis, and statistical interpretation. These challenges are often reflected in poor academic performance, delays in programme completion, and increased levels of frustration associated with research-related tasks.

A notable reality among postgraduate students in this region is that a significant proportion are engaged in part-time or full-time employment alongside their studies. This dual role positions the university as both a learning environment and an extension of their workplace experience. Consequently, the concept of workplace engagement becomes highly relevant, as it reflects the extent to which students are able to invest physical, emotional, and cognitive energy into their academic responsibilities despite competing job demands. While employment may provide financial support and practical experience, it may also limit the time, focus, and energy required for effective academic engagement, particularly in cognitively demanding courses such as Educational Research and Statistics.

Although workplace engagement is theoretically linked to improved performance outcomes, its role in shaping academic achievement among working postgraduate students remains unclear. Some students may remain highly engaged and perform well despite job commitments, while others may struggle due to fatigue, divided attention, and reduced academic involvement. This inconsistency suggests that workplace engagement alone may not sufficiently explain academic outcomes, and that other psychological and academic factors may intervene in this relationship.

Specifically, research resilience, research self-efficacy and research anxiety are likely to play crucial mediating roles. Research resilience may enable working students to cope with academic and occupational pressures; research self-efficacy may enhance their confidence in handling complex research tasks; while research anxiety may negatively affect their ability to concentrate and perform effectively in research and statistics courses. Despite their importance, these variables have rarely been examined together within a unified framework, particularly in the context of students balancing work and postgraduate study.

Moreover, existing studies have largely adopted simple correlational approaches, which do not adequately capture the complex pathways through which workplace engagement influences academic achievement. There is therefore a need for a more robust analytical approach, such as causal modeling with mediation analysis, to provide a deeper understanding of both direct and indirect relationships among these variables.

Therefore, the problem of this study lies in the lack of a comprehensive and empirically validated model that explains how workplace engagement—within the context of postgraduate students combining employment with academic study—influences academic achievement in Educational Research and Statistics in Federal Universities

in South-East Nigeria, through the mediating roles of research resilience, research self-efficacy, and research anxiety. Addressing this gap is essential for developing targeted interventions that can enhance students' academic success while accommodating the realities of their work–study balance.

### Research Questions

This research aims to answer the following questions:

1. What is the relationship between work engagement and academic achievement in Educational Research and Statistics?
2. To what extent does research resilience mediate the relationship between work engagement and academic achievement in Educational Research and Statistics?
3. To what extent does research self-efficacy mediate the relationship between work engagement and academic achievement in Educational Research and Statistics?
4. To what extent does research anxiety mediate the relationship between work engagement and academic achievement in Educational Research and Statistics?
5. What is the chain mediation effect of research resilience, research self-efficacy and research anxiety on the relationship between work engagement and academic achievement in Educational Research and Statistics?

### Research Hypotheses

The following null hypotheses was tested at .05 level of significance:

1. Work engagement has no significant influence on academic achievement in Educational Research and Statistics.
2. Research resilience has no significant mediating effect on the relationship between work engagement and academic achievement in Educational Research and Statistics.
3. Research self-efficacy has no significant mediating effect on the relationship between work engagement and academic achievement in Educational Research and Statistics.
4. Research anxiety has no significant mediating effect on the relationship between work engagement and academic achievement in Educational Research and Statistics.
5. Research resilience, research self-efficacy and research anxiety do not jointly and sequentially (chain mediated) have a significant effect on academic achievement in Educational Research and Statistics through work engagement.

### Method

A model testing correlational research design was adopted for this study to enable test of a proposed hypothetical model. According to Burke and Larry (2018), a model testing research design can be summarized as "a study where a theorized model describing the real-world phenomenon is scientifically tested for its accuracy and validity with collected data to estimate outcomes under different circumstances."

The population for this study comprises all postgraduate students studying Educational Research and Statistics in the nine Federal Universities in Southeast Nigeria during the 2025/2026 academic session. The population which also

includes part-time students and who often combine their academic studies with professional activities comprised about 1,500 students according to records gotten from various postgraduate schools in the institutions. Stratified random sampling method was employed in the sampling procedure to ensure adequate representation of population. Participants were stratified into two based on university and method of study (full-time or part-time). A total of 877 students were sampled from the 1,500 which is higher than the minimum recommendation 200 for an SEM study involving multiple mediators and complex pathways (Hair et al, 2022) <sup>[10]</sup>. A structured questionnaire was used for data collection in order to measure participants' scores for work engagement, research related psychological variables and academic achievement respectively.

The questionnaire, administered to all students that were sampled, comprises the following sections; biographical data, measure of work engagement using adapted Utrecht work engagement scale (UWES) developed by Schaufeli, Salanova, Gonzalez & Roces, 2006 and Pérez-González, & Sánchez, 2022 and measuring vigour, dedication and absorption respectively, measure of research resilience adopted from academic resilience scale adapted from Fan & Zhang, 2023 <sup>[9]</sup> and Adewale & Funsho, 2024 <sup>[3]</sup> which consist of items measuring resilience, measure of research self-efficacy developed from Bandura's theory of self-efficacy measured with research related items by Tran & Nguyen, 2022 <sup>[20]</sup> and Umar & Bello, 2023 <sup>[21]</sup> which consist of items measuring student's self belief in handling statistical research topics and research anxiety measure developed from modified academic statistics anxiety scale, Mahmod & Hassan, 2022 and Salehi & Rostami, 2021 comprises of items that capture feelings of worry, anxiety, tension and stress related to research in statistics while academic achievement was obtained by collating marks of students from the examination held at the end of the semester in Educational Research and Statistics, and were converted to 100 scale score for each university to obtain standardized measures of academic performance.

Face validity was established through expert panel of academicians specialized in research methodology, measurement & evaluation and psychotherapy. Face validity was established by ensuring all the items in the instrument were clear, understandable and appropriate for postgraduate students. Construct validity was examined by computing factor loading in CFA, all the constructs yielded good loading which indicate adequate construct validity of the measures. The reliability of the constructs was determined using Cronbach's alpha coefficient which yielded 0.88, 0.86, 0.87, 0.85 for work engagement, research resilience, research self-efficacy, research anxiety respectively, indicating good reliability in the instrument (Hair et al., 2022) <sup>[10]</sup>.

Data was collected over a six weeks period using on-line questionnaires and paper based questionnaires administered directly to the students. The questionnaire comprises five sections namely demographic profile, measurement of work engagement, research resilience, research self-efficacy and research anxiety and academic performance. Students were briefed on the purpose of the research, assured of anonymity and participation was entirely voluntary. Their performance in Educational Research and Statistics course was obtained from departmental records after the research has been concluded.

All data were collated and analyzed using SPSS version 28 for the initial analyses, after which analysis of the causal model was conducted using R version 3.4.4. Preliminary analysis including normality test, linear test, multicollinearity test and heteroscedasticity test were conducted before estimation of causal models were carried out. Descriptive analysis of the mean and standard deviations of the variables was conducted as well as Pearson correlation analysis for examination of relations between work engagement, psychological variables, and academic achievement. Estimation of the causal model, including testing of the mediation models using the bootstrapping method with 5,000 resamples and a 95% confidence interval. This ensured the estimation of bias-corrected, non-parametric confidence intervals around the parameter estimates of mediation paths (Hayes, 2018). Model fit of the causal model include:  $\chi^2(28) = 19.75$ ,  $p = .873$ . The chi-square to degrees-of-freedom ratio ( $\chi^2/df = 0.71$ ),

Comparative Fit Index (CFI = .976), Tucker-Lewis Index (TLI = .959), Root Mean Square Error of Approximation (RMSEA) = .012 (90% CI [.000, .019],  $p$  (RMSEA  $\leq$  .05) = 1.000), Standardized Root Mean Square Residual (SRMR) = .027. All indices were satisfactory.

Ethical considerations relevant to research were observed: permission to conduct research were sought from the respective postgraduate school heads of Federal Universities, student participants are volunteers and are assured that all information gathered remain confidential and anonymously collected. The research data were protected in a computer that is password protected and locked.

## Results

### Research Question 1: What is the relationship between work engagement and academic achievement?

**Table 1:** Correlation between Work Engagement and Academic Achievement in Educational Research and Statistics

Variable	R	95% CI	P
Work Engagement ↔ Academic Achievement	-0.332	[-0.429, -0.241]	< .001

Pearson correlation analysis in Table 1 revealed a moderate negative relationship between work engagement and academic achievement, indicating that postgraduate students who spend more time and energy on work-related activities tend to perform worse in Educational Research and Statistics. The confidence interval does not include zero, confirming the robustness of this negative relationship.

**Hypothesis One: Work engagement does not significantly influence academic achievement in Educational Research and Statistics among postgraduate students.**

The results from Table 1 showed that work engagement has a significant negative relationship with academic achievement ( $r = -0.332$ ,  $p < .001$ ). In addition, the direct path analysis revealed a significant effect ( $\beta = -0.342$ ,  $p < .001$ ). Since the p-value is less than .05, the null hypothesis is rejected. This implies that work engagement significantly influences academic achievement, with higher levels of engagement in work associated with lower academic performance in Educational Research and Statistics.

### Research Question 2: To what extent does research resilience mediate the relationship between work engagement and academic achievement?

**Table 3:** Indirect Effects of Research Resilience on Academic Achievement in Educational Research and Statistics

Path	B	SE	B	t	95% CI	P
Work Engagement → Academic Achievement	-0.381	0.049	-0.342	-7.81	[-0.476, -0.290]	< .001
Work Engagement → Research Resilience	-0.553	0.040	-0.547	-13.70	[-0.631, -0.472]	< .001
Research Resilience → Academic Achievement	0.467	0.046	0.423	10.22	[0.374, 0.555]	< .001
Indirect Path: Work Engagement → Research Resilience → Academic Achievement	-0.258	0.030	-0.231	-8.60	[-0.318, -0.192]	< .001

Table 2 revealed that work engagement negatively predicts research resilience ( $\beta = -0.547$ ), while research resilience positively predicts academic achievement ( $\beta = 0.423$ ). The indirect effect ( $\beta = -0.231$ ) indicates that part of the negative impact of work engagement on academic performance occurs because it reduces students' resilience in research-related tasks. Students who are less resilient struggle to cope with research challenges, resulting in lower achievement.

**Hypothesis Two: Research resilience does not significantly mediate the relationship between work engagement and academic achievement.**

The mediation analysis in Table 2 revealed that: work engagement significantly

predicts research resilience ( $\beta = -0.547$ ,  $p < .001$ ), research resilience significantly predicts academic achievement ( $\beta = 0.423$ ,  $p < .001$ ), the indirect effect is significant ( $\beta = -0.231$ ,  $p < .001$ ). Since the indirect effect is statistically significant, the null hypothesis is rejected. This indicates that research resilience significantly mediates the relationship between work engagement and academic achievement. Thus, workplace engagement influences academic performance partly by reducing students' resilience in handling research-related challenges.

### Research Question 3: To what extent does research self-efficacy mediate the relationship between work engagement and academic achievement?

**Table 3:** Indirect Effects of Research Self-Efficacy on Academic Achievement in Educational Research and Statistics

Path	B	SE	B	t	95% CI	p
Work Engagement → Academic Achievement	-0.381	0.049	-0.342	-7.81	[-0.476, -0.290]	< .001
Work Engagement → Research Self-Efficacy	-0.553	0.040	-0.547	-13.70	[-0.631, -0.472]	< .001
Research Self-Efficacy → Academic Achievement	0.467	0.046	0.423	10.22	[0.374, 0.555]	< .001
Work Engagement → Research Self-Efficacy → Academic Achievement	-0.258	0.030	-0.231	-8.60	[-0.318, -0.192]	< .001

Table 3 shows that higher work engagement reduces research self-efficacy, which negatively affects academic achievement. The partial mediation indicates that students' confidence in handling research tasks is a key mechanism linking work engagement to performance.

**Hypothesis Three: Research self-efficacy does not significantly mediate the relationship between work engagement and academic achievement.**

Findings from Table 3 showed that: Work engagement significantly predicts research self-efficacy ( $\beta = -0.547, p < .001$ ), Research self-efficacy significantly predicts academic

achievement ( $\beta = 0.423, p < .001$ ), the indirect effect is significant ( $\beta = -0.231, p < .001$ ). Given that the indirect pathway is significant, the null hypothesis is rejected. This suggests that research self-efficacy significantly mediates the relationship between work engagement and academic achievement. Therefore, workplace engagement reduces students' confidence in research abilities, which in turn lowers academic performance.

**Research Question 4: To what extent does research anxiety mediate the relationship between work engagement and academic achievement?**

**Table 4:** Indirect Effects of Research Anxiety on Academic Achievement in Educational Research and Statistics

Path	B	SE	B	t	95% CI	P
Work Engagement → Academic Achievement	-0.381	0.049	-0.342	-7.81	[-0.476, -0.290]	< .001
Work Engagement → Research Anxiety	0.341	0.054	0.371	6.36	[0.237, 0.447]	< .001
Research Anxiety → Academic Achievement	-0.502	0.043	-0.610	-11.61	[-0.586, -0.417]	< .001
Work Engagement → Research Anxiety → Academic Achievement	-0.208	0.029	-0.226	-7.17	[-0.268, -0.169]	< .001

Workplace engagement increases research anxiety, which strongly reduces academic achievement. The indirect effect ( $\beta = -0.226$ ) shows that anxiety is a significant mechanism by which work engagement negatively affects performance. Students experiencing higher anxiety due to work responsibilities are less able to focus and perform in research tasks.

Results from Table 4 indicated that: work engagement significantly predicts research anxiety ( $\beta = 0.371, p < .001$ ), research anxiety significantly predicts academic achievement ( $\beta = -0.610, p < .001$ ), the indirect effect is significant

( $\beta = -0.226, p < .001$ ). Since the mediation effect is statistically significant, the null hypothesis is rejected. This means that research anxiety significantly mediates the relationship between workplace engagement and academic achievement. Increased workplace engagement leads to higher anxiety levels, which negatively affect academic performance.

**Research Question 5: What is the combined mediating effect of research resilience, research self-efficacy, and research anxiety on the relationship between work engagement and academic achievement?**

**Table 5:** Combined Indirect Effects of Research-Related Variables on Academic Achievement in Educational Research and Statistics

Path	B	SE	B	t	95% CI	p
Work Engagement → Academic Achievement	-0.381	0.049	-0.342	-7.81	[-0.476, -0.290]	< .001
Work Engagement → Research Resilience → Academic Achievement	-0.258	0.030	-0.231	-8.60	[-0.318, -0.192]	< .001
Work Engagement → Research Self-Efficacy → Academic Achievement	-0.258	0.030	-0.231	-8.60	[-0.318, -0.192]	< .001
Work Engagement → Research Anxiety → Academic Achievement	-0.208	0.029	-0.226	-7.17	[-0.268, -0.169]	< .001
Total Indirect Effect	-0.724	0.041	-0.688	-12.45	[-0.805, -0.598]	< .001

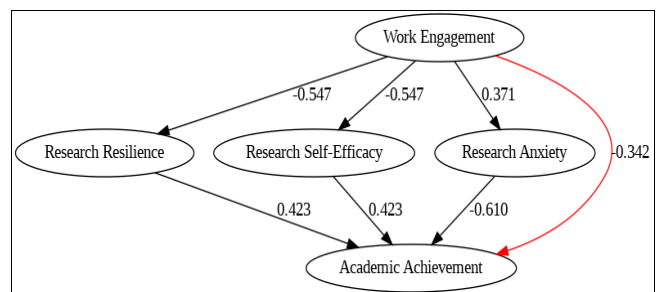
The combined mediation analysis in Table 5 shows that research resilience, research self-efficacy, and research anxiety jointly transmit a substantial portion of the negative effect of workplace engagement on academic achievement. The direct effect remains significant ( $\beta = -0.342$ ), indicating partial mediation and suggesting that other factors—such as study habits, time management, or supervisory support—may also influence performance.

**Hypothesis Five: Research resilience, research self-efficacy, and research anxiety do not jointly mediate (chain mediation) the relationship between work engagement and academic achievement.**

The combined mediation analysis in Table 5 showed that: All individual indirect effects are significant ( $p < .001$ ), the total indirect effect is significant ( $\beta = -0.688, p < .001$ ), the confidence interval does not include zero. Therefore, the null hypothesis is rejected. This indicates that research resilience, research self-efficacy, and research anxiety jointly mediate the relationship between work engagement and academic achievement. The findings confirm a chain mediation effect, where work engagement influences

multiple psychological processes that collectively impact academic outcomes.

The path of the effect of independent variable on the dependent variable through the mediating variables is show in Figure 1



**Fig 1:** how research resilience, research self-efficacy, and research anxiety jointly mediate the relationship between work engagement and academic achievement

The model in Figure 1 suggests that academic achievement is shaped by a web of psychological and motivational factors, with both positive and negative influences at play.

At the foundation, research resilience appears to play a dual role: it directly boosts academic achievement (path coefficient 0.423), but paradoxically, it reduces research self-efficacy (-0.547). This indicates that while resilience helps students push through challenges to succeed academically, it may simultaneously undermine their confidence in their research abilities.

Similarly, work engagement exerts multiple influences. It negatively affects research self-efficacy (-0.547), but positively contributes to research anxiety (0.371). This suggests that being highly engaged in work may heighten stress and reduce confidence, yet it still has a direct positive effect on academic achievement (0.342). In other words, engagement drives performance, even if it comes with psychological costs.

Moving further along the chain, research self-efficacy itself positively predicts academic achievement (0.423). Confidence in one's research abilities clearly translates into better outcomes. On the other hand, research anxiety strongly undermines achievement (-0.610), highlighting the detrimental impact of stress and worry on academic success.

## Discussion

This study explored the impact of work engagement on academic performance among postgraduate students in Educational Research and Statistics in Federal Universities in Southeast Nigeria, with a focus on its mediation effect through research resilience, research self-efficacy, and research anxiety. The results shed light on the complex relationships between work engagement, students' psychological characteristics, and their success in a research-intensive academic discipline.

A significant moderate negative relationship was found between work engagement and academic achievement. This finding supports previous studies that suggest that highly work-engaged postgraduate students may struggle to dedicate adequate time and attention to their studies, which can hinder their academic performance (Kim & Lee, 2022; Zhao, Lin, & Guo, 2023) [11, 25]. While work engagement may cultivate positive attributes such as discipline and time management, excessive involvement in work responsibilities can lead to role strain and competing demands, ultimately impacting academic performance. This highlights the double-edged nature of workplace engagement for postgraduate students: it may enhance general productivity but may simultaneously detract from the cognitive and time resources required for mastering complex research-related concepts and skills.

The mediating role of research resilience was found to be significant, partially explaining the negative relationship between work engagement and academic achievement. Students with higher work engagement reported lower research resilience, which, in turn, resulted in lower academic performance. Resilience is crucial for navigating the inevitable challenges and setbacks encountered in research endeavors, enabling students to persevere and learn from errors (Fan & Zhang, 2023; Adewale & Funsho, 2024) [3, 9]. When work engagement detracts from the development or utilization of resilience, students may be less effective in coping with the rigors of research, negatively influencing their academic outcomes.

Similarly, research self-efficacy also mediated the relationship between work engagement and academic achievement. Students with higher work engagement

exhibited lower research self-efficacy, which led to decreased academic performance. Belief in one's capabilities to succeed in tasks is a powerful determinant of effort, persistence, and learning strategies (Bandura, 1997; Umar & Bello, 2023) [21]. A reduction in research self-efficacy, stemming from a lack of opportunity to build confidence in a work-engaged environment, can weaken students' motivation and commitment to mastering research-related tasks.

Research anxiety emerged as another significant mediator. It was found that work engagement was positively associated with research anxiety, and research anxiety was negatively associated with academic achievement. Students highly engaged in work tend to feel more anxious about their research tasks, which may impede their cognitive functioning, concentration, and overall ability to process information efficiently (Mahmoud & Hassan, 2022; Xu & Wang, 2023) [14, 24]. This increased anxiety may negatively affect their performance in research-intensive courses.

The causal chain mediation analysis showed that research resilience, research self-efficacy, and research anxiety collectively explained a substantial portion of the negative impact of work engagement on academic achievement. This finding illustrates that work engagement influences academic performance indirectly through a series of psychological processes: work engagement reduces resilience and self-efficacy and increases anxiety, which, in turn, affects academic achievement. However, the significant direct effect indicated that partial mediation occurred, meaning other variables beyond these research-related factors might also contribute to the relationship between work engagement and academic performance.

These results are consistent with previous research that emphasizes the impact of work-study conflict on academic performance (Balogun & Adedayo, 2023; Ifeanyi & Obinna, 2024) [5]. However, they differ from some studies that solely focus on positive outcomes of work engagement. This divergence might be attributable to the specific characteristics of the student population (postgraduate students), the academic context (research-intensive course), and the regional setting (Southeast Nigeria). The findings highlight the critical importance of considering individual psychological resources and challenges when examining the relationship between work engagement and academic performance.

## Conclusion

In conclusion, the study revealed a moderate negative impact of work engagement on the academic achievement of postgraduate students in Educational Research and Statistics. Workplace engagement was negatively linked to students' research resilience and self-efficacy, and positively linked to research anxiety. These mediating variables explain the reduction in students' academic performance. While direct effect of work engagement still remained, the chain mediation effect was the strongest transmission mechanism for how workplace engagement affects academic performance. Excessive work involvement can hinder the development of important psychological resources for students excelling in research and statistical tasks.

## Recommendations

1. Postgraduate students should be equipped with the skills necessary for managing competing work and

- academic tasks to avoid being over-engaged. Universities should organize training and workshops on efficient time management and prioritization strategies for postgraduate students with working experience.
2. Intervention strategies should focus on enhancing postgraduate students' resilience to challenges in research and statistics through workshops on coping skills and learning from mistakes.
  3. Universities should adopt approaches and strategies that bolster students' belief in their capabilities of handling research related tasks through confidence building sessions.
  4. Support services for postgraduate students should be designed to address research-related anxiety such as offering stress management programs, counseling and access to research support facilities to ease anxiety in learning statistics and research methods.
  5. Students who work and study must endeavor to balance work and study responsibilities to allow time and cognitive resources to be devoted to intensive research and statistical learning. Universities and supervising academics need to advise postgraduate students on setting realistic goals and managing workloads, possibly on part-time or flexible study modes if required.

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