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RELATIONSHIP BETWEEN ACADEMIC RESILIENCE AND ACADEMIC ACHIEVEMENT AMONG SECONDARY SCHOOL STUDENTS IN PHYSICS IN AWKA EDUCATION ZONE, ANAMBRA STATE

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Abstract

The study investigated the relationship between academic resilience and academic achievement among secondary school students in Physics in Awka Education Zone of Anambra State. The research was guided by two research questions and two null hypotheses which were tested at 0.05 level of significance. Correlation research design was adopted for the study. The population of the study comprised 2532 secondary school two (SS 2) students offering Physics from 62 public secondary schools in the Zone. Multi-stage sampling procedures was used to draw 345 sample size from the population. The instruments used for data collection included; Physics Resilience Questionnaire (PRQ) and average scores of students for 2024/2025 academic session. The instrument PRQ was validated by three experts, two from the Department of Science Education and one from Educational Foundations (Measurement and Evaluation unit), all in Nnamdi Azikiwe University, Awka. The reliability of the instruments were established using Cronbach's alpha, with coefficients of 0.79 for PRQ, indicating satisfactory internal consistency. The data collected were analyzed with Pearson Product-Moment Correlation and Multiple Linear Regression analysis, using Statistical Package for Social Sciences (SPSS, version 25). The findings of the study showed that there is a weak positive relationship between academic resilience and academic achievement among SS2 students offering Physics. The study further showed a weak positive significant relationship between academic resilience and academic achievement among male students while it showed a moderate positive significant relationship between academic resilience and academic achievement among female students. Based on the findings, the study concluded that students who demonstrate higher levels of academic resilience tend to perform better academically, but the influence of resilience on achievement is relatively low. Furthermore, academic resilience contributes more significantly to the academic achievement of female Physics students than male students. The study recommended amongst others that schools should design interventions such as mentorship, peer-support groups and problem-solving activities that strengthen students' ability to cope with challenges in Physics learning.

Key Words: Resilience, Academic Achievement, Relationship, Physics, Gender

Introduction

Physics as an aspect of science, plays a critical role in deepening our understanding of natural phenomena by explaining the fundamental principles that govern matter, energy, and the forces of the universe. Physics is a branch of science that is concerned with the nature and

properties of matter and energy. It provides the theoretical and practical knowledge needed to drive progress in industries such as energy, telecommunications, medicine, and space exploration. Physics studies the quantifiable physical rules that regulate our surroundings through experiments, observations and mathematical analysis. According to Ajadi and Amoo (2024), Physics is the scientific study of matter and natural processes, utilizing empirical and quantitative methods. Physics seeks to understand how objects move and interact in space and time, often through mathematical models and experiments. The knowledge of Physics according to Oguama, Ibuot and Obiora (2020), develops in students, the scientific and technological knowledge, skills and attitudes which will assist them to make decisions based on observation and experimentation. It studies the fundamental principles that govern the universe, including concepts such as force, motion, energy, mass and charge. It encompasses various subfields such as mechanics, thermodynamics, electromagnetism, quantum Physics and relativity. The subject requires scientific methodologies to understand theoretical concepts and apply them in real-world circumstances (Ajadi, 2017).

Although, Physics is an important subject, students' academic achievement in the subject and their attitudes to the subject at secondary school and other institution of higher learning have not been encouraging. For instance, data from the West African Examination Council (WAEC) show that less than 60% of Physics candidates passed at distinction levels in the last seven years (2017 - 2023), 60.24% in 2018 and 61.44% in 2022 of the students passed at the credit level. However, there was a decline with pass rates falling to 56.48% in 2017, 53.9% in 2019, 51% in 2020, 56.2% in 2021 and 59.1% in 2023 indicating average students' performance when compared with other science subjects like Chemistry and Biology. The statistical performance of students in Physics serves as a direct indicator of their academic achievement, reflecting the extent to which they have effectively understood and applied key scientific concepts and problem-solving skills.

Academic Achievement refers to the measurable performance and accomplishments of a student in educational tasks, typically assessed through grades, test scores, or other formal evaluations. According to Samuel, Akobundu and Okonkwo (2024), academic achievement refers to the performance outcome that indicates how well an individual has attained particular goals within an educational setting. In essence, a student's degree of achievement is essentially

determined by the marks or grades they receive in examinations. Furthermore, Nwankwo, Achufusi, Orafu and Aghado (2019) further opined that academic achievement is a measure of output which in education are expressed in terms of learning, that is, changes in knowledge, skills and attitudes of individuals as a result of their experiences within the schools' system. This technique offers a standardized way to assess educational progress and achievement within the formal academic system. Academic achievement continues to be a significant concern for parents, educators, researchers, and society as a whole, especially in light of the noticeable decline in secondary school students' academic achievement.

Many factors have been linked to students' low achievement in Physics, as well as in science in general. For instance, Chinweuba-Eze (2021) argued that teaching methods, laboratory equipment, and student characteristics such as psychological, social, cognitive and psycho-social aspects are factors that affect students' achievement in Physics. In addition, Nweke and Okigbo, (2023) also claimed that psychological factors such as students' emotions, academic coping abilities, cognitive flexibility, intelligence quotient, self-regulation, study habits, emotional intelligence and resilience might affect students' academic achievement. While these factors significantly influence academic achievement, the role of academic resilience emerges as crucial element on how students navigate these challenges.

Academic resilience is the ability of a student to effectively adapt, persevere and thrive in the face of academic challenges, setbacks and pressures. Radhamani and Kalaivani (2021) defined resilience as the ability to overcome adversity and achieve achievement in several areas of life. Abubakar Ain, Mohd, Hashim, Fatin and Kamarudin (2021) defined academic resilience as a student's ability to improve academic achievement in the aftermath of a negative event, such as failing an individual assessment. Academic resilience involves maintaining a positive attitude, sustaining motivation, and employing strategies to overcome difficulties, ultimately enabling consistent academic progress and success. Moreover, Academic resilience is an important concept that should be promoted in educational institutions. It is influenced by both internal factors, such as self-efficacy and emotional regulation and external factors, such as support systems and environmental resources (Reyes and Torres, 2025).

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Academic resilience is important in Nigeria because studying at a post-secondary institution is a difficult and stressful experience (Iviemu, 2021). As a result, only students who are academically resilient are better able to deal with academic stress experienced in Nigerian tertiary institutions. A study by Wulandari (2021) highlight the need of looking into not just who is resilient, but also the elements that allow children to acquire resilience in educational settings particularly in facing academic challenges and setbacks. Steel *et al* (2024) asserted that academic achievement demonstrates a strong link with resilience. A study by Ononye, Ogbeta, Ndudi, Bereprebofa and Maduemezia (2022) revealed that students with higher levels of academic resilience and emotional intelligence exhibited better academic performance, suggesting that the ability to manage negative emotions effectively contributes to academic achievement. A study conducted by Fru-Ngongban (2023) showed that there is a high significant relationship between resilience and academic achievement of secondary school students. In another study by Nwosu, Anierobi, and Okeke (2022) the report revealed that academic resilience have a significant influence on academic achievement. Furthermore, Padmashri and Krishnamurthy (2018) found that there is a significant correlation between level of resilience and the scholastic performance of students. Academic resilience has been found to vary across gender, suggesting that male and female students may differ in the ways they cope with academic challenges and sustain motivation toward academic achievement.

Gender is a dynamic construct shaped by societal norms, cultural practices and individual experiences. According to Iroko, Adesina, and Asanre (2024), gender refers to a socially constructed trait of males and females in a given community, different from sex. Recent studies highlight that female students face structural barriers such as limited access to resources and societal expectations, which can affect their academic performance. For instance, findings by Ahmed (2024) indicate that male students consistently outperform females in cumulative grade point averages and national examinations due to disparities in support systems and learning opportunities. In a study by Mwangi and Ireri (2017), it was found that there are gender differences in academic resilience. The girls were found to be more academically resilient compared to the boys. Furthermore, Adeyi, Popoola, Sulaiman, Onaolapo and Okunola (2024) showed that gender difference exists on academic performance of undergraduates.

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Despite the significance of academic resilience, studies have mostly treated it in isolation or within broad academic contexts, often neglecting subject-specific performance like Physics, a subject that demands consistent effort, cognitive endurance and organized study habits. Moreover, few empirical investigations have examined the relationship between this non-cognitive factor and academic achievement in Physics, particularly within the Awka Education Zone secondary school settings. It is against this backdrop, that the study investigated the relationship between academic resilience and academic achievement among secondary school students in Physics in Awka Education Zone of Anambra State.

Purpose of the Study

The purpose of the study is to investigate the relationship between academic resilience and academic achievement among secondary school students in Physics in Awka Education Zone of Anambra State. Specifically, the study sought to:

1. Relationship between academic resilience and academic achievement among secondary school (SS2) students in Physics in Awka Education Zone.
2. Relationship between academic resilience and academic achievement among male and female secondary school (SS2) students offering Physics in Awka Education Zone.

Research Questions

The following research questions guided the study:

1. What is the relationship between academic resilience and academic achievement among SS 2 students offering Physics in Awka Education Zone?
2. What is the relationship between academic resilience and academic achievement among male and female SS 2 students offering Physics in Awka Education Zone?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant relationship between academic resilience and academic achievement among SS 2 students offering Physics in Awka Education Zone.

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2. There is no significant relationship between academic resilience and academic achievement among male and female SS 2 students offering Physics in Awka Education Zone.

Methodology

The study adopted correlation research design, it was conducted in Awka Education Zone of Anambra State. The population of the study comprised of 2,532 Senior Secondary School two (SS 2) students offering Physics (1,440 females and 1,224 males) from all the 62 senior secondary schools in Awka Education Zone, Anambra State**.** Multi-stage sampling procedures was used to sample out 345 SS2 students from the population. Physics Resilience Questionnaire (PRQ) was used for data collection on students' resilience, while Students average Physics score of the three terms for 2024/2025 academic session was used for their achievement scores. The Physics Resilience Questionnaire (PRQ) was validated by three experts, all from Faculty of Education Nnamdi Azikiwe University, Awka, Anambra State, Nigeria. To establish the internal consistency of the instruments, PRQ, Cronbach's Alpha method was utilized, yielding a coefficient of 0.79. Data was collected by direct administration of the questionnaire by the researcher and few research assistants. The data collected was analyzed using Pearson Product Moment Correlation (PPMC), the reason for using Pearson correlation was to measure the strength and direction of the relationship between the independent variable (academic resilience) and academic achievement.

For answering the research questions, the correlation coefficients are categorized as follows: r = 0.00 (no relationship), r = ±0.01 to ±0.20 (low relationship), r = ±0.21 to ±0.49 (weak relationship), r = ±0.50 to ±0.69 (moderate relationship), r = ±0.70 to ±0.99 (high relationship), and r = ±1.00 (perfect relationship). The null hypotheses were tested at a 0.05 level of significance**,** using the following decision rule: reject the null hypothesis if the probability value (p-value) is less than or equal to 0.05 **(**$p \leq 0.05$) and do not reject if $p > 0.05$.

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Results

Table 1: **Pearson r on the relationship between academic resilience and academic achievement among SS 2 students in Physics in Awka Education Zone**

Sources of Variation	N	Academic Resilience r	Academic Achievement r	*P*-value	Decision
Academic Resilience	345	1.	0.357	.000	weak positive significant relationship
Academic Achievement		0.357	1		

The result in Table 1 reveals a weak positive relationship (r = 0.357) between academic resilience and academic achievement among SS2 students offering Physics in Awka Education Zone. This implies that as students' academic resilience increases, their academic achievement in Physics tends to improve, although the strength of this relationship is relatively weak.

Hypothesis One

There is no significant relationship between academic resilience and academic achievement among SS 2 students offering Physics in Awka Education Zone.

The result in Table 1 revealed that there is a significant relationship between academic resilience and academic achievement among SS2 students offering Physics in Awka Education Zone. The result yielded a correlation coefficient of r = 0.357 with a *p*-value of 0.000, since the *p*-value is less than the 0.05, thus, the null hypothesis is rejected. This indicates that academic resilience plays a meaningful role in influencing students' academic achievement in Physics, and students who are more resilient tend to perform better academically.

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Table 2: Pearson r on the relationship between academic resilience and academic achievement scores of SS 2 male and female students in Physics in Awka Education Zone

Gender	Sources of Variation	N	Academic Resilience r	Academic Achievement r	*P*-value	Decision
Male	Academic Resilience	173	1	0.240	0.001	weak positive significant relationship
	Academic Achievement		0.240	1		
Female	Academic Resilience	172	1	0.516	0.000	moderate positive significant relationship
	Academic Achievement		0.516	1		

Table 2 shows that there is a weak positive relationship between academic resilience and academic achievement among male SS2 students offering Physics in Awka Education Zone, with a correlation coefficient of r = 0.240. For female students, the relationship is stronger, with a moderate positive correlation of r = 0.516. This indicates that while academic resilience is positively related to academic achievement for both genders, the relationship is more pronounced among female students.

Hypothesis Two

There is no significant relationship between academic resilience and academic achievement among male and female SS 2 students offering Physics in Awka Education Zone.

The result presented in Table 2 shows that there is a significant relationship between the academic resilience and academic achievement among male and female SS2 students offering Physics in Awka Education Zone. The result for SS2 male students showed a correlation coefficient of r = 0.240 with a p-value of 0.001, indicating a weak positive significant relationship. For female students, the correlation is stronger, with r = 0.516 and a p-value of 0.000, indicating

a moderate positive significant relationship. Since the p-values for both male and female students are less than the 0.05 level of significance, thus, the null hypothesis stating that there is no significant relationship between academic resilience and academic achievement among male and female students is rejected. This implies that academic resilience is significantly related to academic achievement for both genders, though the strength of the relationship is higher among females.

Discussion of Findings

The finding of the study revealed a weak positive relationship between academic resilience and academic achievement among SS2 students offering Physics in Awka Education Zone. This implies that as students' academic resilience increases, their academic achievement in Physics tends to improve, although the strength of this relationship is relatively weak. The finding of this study aligns with that of Fru-Ngongban (2023) whose findings revealed there is a high relationship between resilience and academic achievement of secondary school students in Minawao refugee camp. Similarly, Ojeleye, Adegbile and Apanpa (2023) reported that academic resilience have positive effect on students' academic performance in Federal Polytechnic Kaura-Namoda, Gusau, Zamfara state. Furthermore, this finding agrees to that of Padmashri and Krishnamurthy (2018) who found a correlation between resilience and performance of students. This finding is consistent with evidence from other educational contexts where resilience has been shown to be positively linked with students' performance. Such consistency suggests that the ability to adapt to challenges, maintain focus, and persist in the face of academic difficulties contributes meaningfully to achievement. The alignment across studies reinforces the notion that resilience plays an important role in supporting learning outcomes, even though the magnitude of its influence may vary depending on the setting and student population.

The corresponding hypothesis revealed that there is a significant relationship between academic resilience and academic achievement among SS2 students offering Physics in Awka Education Zone. This implies that students' ability to adapt, persevere, and recover from academic challenges (academic resilience) is meaningfully connected to how well they perform academically in Physics. The finding of this study corresponds to that of Uzoma *et al.* (2022) found

that academic resilience significantly and positively predicted academic performance of undergraduate students in Delta State University. This finding is further supported by Nwosu, Anierobi, and Okeke (2022) who revealed that academic resilience have a significant influence on academic achievement among secondary school students in Aguata Local Government Area of Anambra State. This findings resonate with that of Adeyi *et al.* (2024) who showed that academic resilience significantly predicts the academic performance of undergraduate students of LAUTech.

The finding of this study revealed there is a weak positive relationship between academic resilience and academic achievement among male SS2 students offering Physics in Awka Education Zone and a moderate positive relationship among their female counterparts. This indicates that while academic resilience is positively related to academic achievement for both genders, the relationship is more pronounced among female students. This findings aligns with that of Adeyi *et al.* (2024) who found that a gender difference exists on academic performance of undergraduates. Similarly, this finding agrees with that of Mwangi and Ireri (2017) whose findings revealed that there are gender differences in academic resilience and that the girls were found to be more academically resilient compared to the boys.

The corresponding revealed that there is a significant relationship between the academic resilience and academic achievement among male and female SS2 students offering Physics in Awka Education Zone. This implies that academic resilience is significantly related to academic achievement for both genders, though the strength of the relationship is higher among females. This finding is supported by Nwosu, Anierobi, and Okeke (2022) who showed that gender has no significant influence on academic achievement but has a significant influence on academic resilience among the students. The finding of this study contradict that of Padmashri and Krishnamurthy (2018) who found that there is no significant difference between girls and boys with respect their scholastic abilities as well as their resilience attributes. The findings of this study aligns with previous research indicating gender differences in resilience, where females tend to exhibit higher resilience levels, but contrasts with findings that report no significant gender differences in scholastic abilities or resilience attributes. Overall, the results suggest that while

both genders benefit from resilience, it may play a more substantial role in enhancing academic achievement for female students.

Conclusion

Based on the findings, it was concluded that academic resilience is an important factor influencing the academic achievement of SS2 students offering Physics in Awka Education Zone. Academic resilience contributes more significantly to the academic achievement of female Physics students than male students. Academic resilience shows a weak positive relationship with achievement overall, with a stronger effect among female students. The significant relationships found across gender groups and in combined analyses highlight the relevance of fostering both resilience and effective time management strategies to support better achievement in Physics.

Recommendations

Based on the findings of the study, the following recommendations were made:

1. School administrators should design interventions such as mentorship, peer-support groups, and problem-solving activities that strengthen students' ability to cope with challenges in Physics learning. This will help students develop persistence and confidence in handling difficult Physics concepts.
2. Teachers and school administrators should adopt strategies that equally motivate male students. Encouraging male students through role modeling, collaborative learning, and personalized support can help bridge the gap and ensure balanced academic development.

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