Received: 13 Dec 2025 | Accepted: 15 Jan 2026
https://doi.org/10.66997/jsii.v1i1.10

Predictive Influence of Academic Resilience and Its Dimensions on Students' Interest in Learning Biology

Izunna Shedrack Nwuba[1*] and Josephine Nwanneka Okoli[1]

[1]*Department of Science Education, Nnamdi Azikiwe University, Awka, Nigeria*

[*]*is.nwuba@unizik.edu.ng*

Abstract

Studies, in the 21st century, have revealed that students in secondary schools are constantly confronted with evolving psychological conditions and challenges that influence their learning outcomes. The drive to identify these conditions prompted the study on predictive influence of academic resilience on secondary school students' interest in Biology, applying a predictive correlational research design. 1,198 Secondary School Year 2 (SS2) students, obtained using multistage sampling procedure were the respondents. Two instruments; Academic Resilience Scale (ARS) and Biology Interest Scale (BIS) were employed for data collection. The adapted instruments (ARS and BIS) validated by three experts, when pilot tested, yielded reliability coefficient values of 0.81 and 0.86, established using Cronbach alpha. Data collected were analyzed using simple and multiple linear regression analyses. The findings indicated among others that academic resilience caused 13.8% variance in students' interest in Biology, revealing that academic resilience significantly and positively contributed to students in secondary schools' interest in Biology. On contributions of individual dimensions of academic resilience, it was revealed that all the dimensions of academic resilience, individually and jointly, significantly predicted students' interest in biology, except perseverance which although contributed to students' interest in Biology but the contribution was not statistically significant. Given the findings, it was suggested that education stakeholders should organize orientation programmes, counselling sessions and seminars in schools to educate students on strategies that can be employed to strengthen their resilience in academic settings.

Keywords: academic interest, academic resilience, biology, secondary school students

1. Introduction

Education, in today's modern society, has been recognized as the greatest asset any nation can invest in to bring about development and socio-economic progress in their society. Acknowledging the premise, developing countries like Nigeria has redesigned their school curriculum that students on entrance into the senior secondary school level are exposed to a variety of new subjects, social roles and psychological

conditions, that often at times become overwhelming for them and others. Shafiq et al. (2024) stated that these overwhelming demands of academic life, in efforts to overcome them, can have an impact on oneself and others, causing students to become vulnerable in the face of academic challenges. Recognizing the premise, researchers (Nwuba et al., 2024; Omaka, 2025) in the 21st century, in the quest to identify factors that could be influenced to overcome these demands for academic gains, have emphasized on the need to reposition efforts from environmental factors to student personal factors, given that these individual factors significantly influence enthusiasm, passion, and psychological health, that could help students overcome challenges and stemming demands of academic life, for enhanced learning outcomes. In the course of literature review, the researchers flagged resilience as an individual variable that helps individuals withstand hardships, overcome obstacles, surpass hurdles, and successfully cope with stress and demands, and thus was motivated to ascertain its influence on learning outcomes, when applied in education.

Resilience, in education today, has been identified as a psychological variable that influences learning outcomes, as it explains a person's capacity to develop despite the hardships and challenges, he experiences. In academic context, it refers to the capacity of a learner to cope with negative experiences in a manner that optimizes their potential for resilience and achievement (Ramadhani & Sagita, 2022). Rachmawati et al (2024) opined that academic resilience in students enable transformation of academic difficulties into opportunities for growth and transformation, empowering individuals to overcome feelings of helplessness and become agents of change. As a multifaceted construct, Nandal et al (2021) posited that academic resilience has become a vital tool in education as it implies positive psychosocial skills such as positivity, trust in oneself, self-strength and control, mental evaluation, emotional balance, a willingness to learn, an absence of denial, effective coping techniques, a feeling of direction and the capacity to discover meaning, that influences learning outcomes. Supporting the premise, Alumulla (2024) asserted that academic resilience consists of elements that inspire students to do better; like drive, self-assurance, the capacity to reach objectives, effective stress management, and a feeling of wellbeing. In a more comprehensive and condensed form, Cassidy (2016) classified academic resilience into three core dimensions namely; Perseverance (ability to demonstrate diligence, not give up easily and exhibit persistence when confronted with challenges), reflective and adaptive help-seeking (ability to assess ones strengths, inadequacies and proactively look for support and encouragement from others in order to adjust to different circumstances), and negative affect and emotional response (including anxious feelings, hopes and fears, worry, and the recognition of unfavorable situations that people encounter in their lives), that drive individuals to strive and overcome challenges to achieve their goals. A glance through these attributes of resilience, informs one that the concept is a constructive component that helps people grow in the midst of hardship, bad circumstances, and unforeseen circumstances. In the classroom, Almulla (2024) stated that academic resilience nurtures skills of problem-solving and an eagerness for risk-taking, helping learners in creative and critical thinking, exploration of novel concepts, and discovery of inventive answers to tough situations. Almulla explained that academic

resilience empowers students to tackle problems, stay committed to their learning, build new capabilities, and ultimately add to the growth of a knowledge-centered economy and a thriving tomorrow. Academic resilience are facilitators in any learning activity as the attribute assist learners find relevance in their studies, support learning sustainability, promote personal growth, foster positive emotions, increase academic engagement and enhance understanding of course content (Karabıyık, 2020). Similarly, Bittmann (2021) affirmed that resilience allows students to have improved contentment with their success, get good marks and lastly report stronger desire to continue their education on time. In support of the premise, Amzil (2022) proposed that developing resilience, determination, and efficient stress-management techniques, amidst difficulties, in addition to increasing a learner's odds of succeeding academically also safeguards his/her psychological wellbeing and reduces their susceptibility to psychological crisis, dread of failing, and ultimately decline in a highly competitive world and particularly in efforts to meet the demands of a stressful academic life. Concluding, Mwangi et al (2018) reiterated that academic resilience is key to determining students' success as academic resilient students are naturally driven, upbeat, self-controlled, adaptable, exhibit intentionality toward being solution-focused, practice reciprocity, are resolute, obstinate, and have strong interpersonal abilities.

Recognizing these benefits of academic resilience, interest of education stakeholders has been piqued about the concept, evidently shown by the number of empirical studies conducted by researchers to ascertain the influence of the construct on learning outcomes. For instance, Ojeleye et al (2023) explored the influence of self-esteem and academic resilience on students' academic performance in Federal Polytechnic Kaura-Namoda, Zamfara state, adopting a survey and cross-sectional research design. The study revealed that self-esteem and academic resilience have positive and significant effect on students' academic performance. In another study, Oyoo et al. (2018) investigated the extent to which academic resilience predicts academic burnout among secondary school students in Homa-Bay County, Kenya. The results revealed a statistically significant negative correlation exists between academic resilience and academic burnout. Habib (2019) examined the influence of academic resilience on academic motivation and academic confidence of secondary school students in Kashmir, India, revealing that a positive statistically significant correlation exists between academic resilience and academic motivation as well as between academic resilience and academic confidence of secondary school students. In his study, Karabıyık (2020) explored the interaction between academic resilience and academic achievement in university students in Ankara, Turkey, adopting a cross-sectional survey research design and revealed that positive correlations existed between students GPA and perseverance as well as with reflecting and adaptive help-seeking, while a negative correlation existed between students' GPA and negative affect and emotional response. The multiple regression analysis's findings also showed that the sole significant predictor of GPA was reflecting and adaptive help-seeking. Anosike and Okigbo (2023), in their study, explored the co-predictive influence of academic resilience and emotional intelligence on secondary school students' performance and attitude in Physics in Enugu State, Nigeria,

adopting a predictive correlation research design. The study indicated that academic resilience and emotional intelligence jointly influenced students' attitude towards Physics, but however jointly failed to predict performance of students in Physics among other outcomes. A read through the reviewed empirical reviews confirms the assumption that academic resilience benefits learning outcomes. However, based on available literature, no similar study known to the researcher has been conducted, specifically on students' interest in learning Biology in Anambra State, Nigeria to determine if academic resilience influences students' interest in learning the subject, the rationale behind the study.

Interest, in education, has been identified as one of the psychological traits that influences the instructional process, as it drives one to achieve goals. Jumasih (2023) defined it as a feeling of choice and connection to something or activity, with no one telling you to. In academics, interest is a potent motivating factor that propels education, directing academic and professional paths for success (Mbaegbu et al., 2023). As a powerful source of human motivation, Nwuba et al. (2023) noted that interest is capable of arousing and sustaining concentrated effort, lending credence to the reason why education stakeholders have recognized it as a significant driving element, related with the development and control of behavioral goals, that can influence learning and performance. Interest creates instant awareness, aids focus, curbs disruptions, enhances instructional materials connection, and lowers learning monotony (Triarisanti & Purnawarman, 2019). In learning Biology specifically, interest has been recognized as an important factor that motivates students to learn the subject, taking cognizance of the bulky nature of its curriculum. Obimalume (2021) asserted that interest improves students' involvement in biology lessons and sustain their concentration during classroom teaching, boosting their grasp of the topic and in the long run, enhance academic accomplishment in biology. Supporting the premise, Awosika and Okoli (2023) stressed that considering the cumbersome nature of biology as well as the abstractness and difficulty in remembering its concepts and terminologies, students' interest in the subject is the strongest strength for predicting their academic performance in the subject as interest keeps learners focused, retentive, purposeful, committed as well as collaborate in the learning process, with their peers and teachers. Concluding, Nwafor and Oka (2018) asserted that sparking students' interest in learning biology, is the only way of getting them eager to learn the subject, master its knowledge and techniques better as well as inculcate and enhance in them the scientific spirits and attitudes. Recognizing the contributory influence of students' interest to the learning of Biology and its complex concepts and difficult terminologies, the researchers' interest was piqued to determine factors that could be influenced to help students sustain their interest in the classroom. In the course of literature review, the researchers identified academic resilience as a student construct that can help them overcome academic stress, surmount academic pressure and navigate the excessive demands of academic life and thus, was motivated to ascertain its predictive influence on interest of students in learning Biology.

2. Research Questions

The following research questions guided the study:

1. Does academic resilience predict secondary school students' interest in biology?
2. Do individual dimensions of academic resilience (perseverance, reflective and adaptive help-seeking, and negative affect and emotional response) predict secondary school students' interest in biology?

3. Hypotheses

1. Academic resilience is not a significant predictor of secondary school students' interest in biology?
2. Individual dimensions of academic resilience (perseverance, reflective and adaptive help-seeking, and negative affect and emotional response) are not significant predictors of secondary school students' interest in biology?

4. Methodology

A predictive research design was employed for the study. A predictive research design, according to Cresswell (2012), is a type of correlational research design that seeks to not only ascertain the relationship, that exists between variables, but also attempts to predict or understand future behavior to identify the independent variable(s) that predict the dependent variable(s). The respondents were 1,198 students, drawn from the 24,102 SS2 students offering Biology in the 265-government owned secondary schools in Anambra state, in the 2024/2025 academic session, using multi-stage sampling procedure. A 30-item Academic Resilience Scale (ARS) adapted from Academic Resilience Scale (ARS-30) developed by Cassidy in 2016.and Biology Interest Scale (BIS) adapted from the original Academic Interest Scale for Adolescents (AISA) developed by Luo et al in 2019, were employed for data collection. ARS and BIS revalidated by experts were subjected to pilot testing to yield a reliability coefficient of 0.81 and 0.86 respectively, estimated using Cronbach Alpha formula. Data collected were analyzed using regression analyses (simple and multiple regression).

5. Results

Research Question One

Does academic resilience predict secondary school students' interest in biology?

Table 1: Prediction of Secondary School Students' Interest in Biology by their Academic Resilience

Model	R	r^2	Adjusted r^2	Unstandardized coefficients (B)	Std. Error
Constant	0.371[a]	0.138	0.137	61.661	
Academic Resilience				0.274	7.513

[a] *Predictors: (Constant), Academic Resilience (AR).*
Dependent Variable: Interest in Biology (IB).

Table 1 data analysis shows an R-value of 0.371 (indicating a moderate positive relationship between AR and IB) and an R^2 (coefficient of determination) value of 0.138. The coefficient of determination (r^2) value obtained reveals that 13.8% variance in students' interest scores in biology is predicted by their academic resilience. Also, the unstandardized coefficient *B* of 0.274 shows that a unit rise in academic resilience, increases students' interest in biology by 27.4%.

Null Hypothesis One

Secondary school students' academic resilience does not significantly predict their interest in biology.

Table 2: Significance of Prediction of Students' Interest in Biology by their Academic Resilience

Model	Sum of Squares	Df	Mean Square	F	P-value	Decision
Regression	10803.969	1	10803.969	191.398	< .001	Sig.
Residual	67511.343	1196	56.448			
Total	78315.312	1197				

Dependent Variable: Interest Score in Biology.
Predictors: Constant, Academic Resilience.

Data in Table 2 reveals that at an F-value (Df 1 and 1196) of 191.398, the Probability value is < .001. Since the Probability value is less than 0.05 alpha levels, the null hypothesis is rejected, indicating that secondary school students' interest in Biology is significantly predicted by their academic resilience. Since academic resilience is a significant predictor of students' interest in Biology, the regression model (Y = a + bx) for the prediction of students' interest score in Biology as obtained from Table 1, where constant is 61.661 and b value is 0.274 is:

$$\mathbf{ISB = 61.661 + 0.274\ (AR)}$$

Where, **ISB** = Interest Score in Biology and **AR** = Academic Resilience Score

Research Question Two

Do individual dimensions of academic resilience (perseverance, reflective and adaptive help-seeking, and negative affect and emotional response) predict secondary school students' interest in biology?

Table 3: Individual Dimensions of Academic Resilience Contributions to Secondary School Students' Interest in Biology

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	SD. Err.	Beta	T	Sig.
(Constant)	62.838	1.189		52.858	.000
Perseverance	.101	.055	.059	1.849	.065
Reflective & Adaptive Help Seeking	.494	.063	.280	7.823	.000
Negative Effect & Emotional Response	.188	.066	.094	2.831	.005

Dependent Variable: Interest Score in Biology.

Data in table 3 shows the standardized beta coefficients that show the predictive correlation between the variables, and the unstandardized B coefficients that indicate the predictive value of the relative contributions of each dimension of academic resilience to students' interest score in Biology. The table reveals that a unit rise in perseverance increases students interest score by 10.1%, a unit rise in reflective and adaptive help-seeking increases interest score by 49.4% and finally, a unit rise in negative effect and emotional response increases interest score by 18.8%. Based on the table, the order of contributions of each dimension of academic resilience to students' interest score in biology from highest to lowest is; Reflective and adaptive help-seeking (49.4%), followed by negative effect and emotional response (18.8%) and lastly, perseverance (10.1%).

Null Hypothesis Two

The relative contributions of the individual dimensions of academic resilience (perseverance, reflective and adaptive help-seeking, and negative affect and emotional response) to secondary school students' interest in biology is not significant.

Table 4: Significance of Prediction of students Interest Score in Biology by the Individual Dimensions of Academic Resilience

Model	Sum of Squares	Df	Mean Square	F	Sig.	Decision
Regression	11225.475	3	3741.825	66.593	< .001	Sig.
Residual	67089.837	1194	56.189			
Total	78315.312	1197				

Dependent Variable: Interest Score in Biology
Predictors: (Constant), Negative Effect & Emotional Response, Perseverance, Reflective & Adaptive Help Seeking.

Result in Table 4 reveals that all the individual dimensions of academic resilience jointly are significant predictors of students' interest scores in biology, since the p-value obtained is less than 0.05 alpha levels, at an F-value (3 and 1194) of 66.593. Further analysis of data contained in table 3 reveals that, individually, perseverance is not a significant predictor of students' interest scores in Biology, since the p-value (0.065) obtained at t-value (3,1194) of 1.849 is greater than 0.05 alpha levels, while reflective and adaptive help-seeking (< .001) and negative effect and emotional response (0.005), on their own, predicted students' interest scores in biology significantly, since their p-values is less than 0.05 level of significance at t-values (3, 1194) of 7.823 and 2.831 respectively. Thus, the only significant contributors

to students' interest scores in biology in the order of significance are reflective and adaptive help-seeking and negative effect and emotional response. However, since all the dimensions of AR jointly predicted students' interest scores in biology significantly, the equation for the regression model ($Y = a + bx_1 + cx_2 + dx_3$) derived from table 3 can be written as:

ISB = 62.838 + 0.101 (P) + 0.494 (RAHS) + 0.188 (NEER)

Where, **ISB** = Interest Scores in Biology**, P** = Perseverance, **RAHS** = Reflective and Adaptive Help Seeking, and **NEER** = Negative Effect and Emotional Response

6. Discussion

The present study's findings revealed that academic resilience positively and significantly predicted Biology students' interest in learning Biology. This positive and significant prediction of Biology students' interest can be linked to the attributes of determination, glee, internal recognition and sense of control, self-motivation, self-confidence, problem-solving skills, assistance from others, as well as having aims and aspirations, associated with academic resilience. Academic resilient students through the dimensions of negative effect and emotional response, perseverance and reflective and adaptive help seeking, learn how to be more tolerant, avoid depression, deal with anxiety and other mental/emotional health issues that may occur during schooling, positively influencing their interest in biology. The present findings accede to that of Oyoo et al (2018) who reported that academic resilience negatively and significantly predicted students' academic burnout, meaning that as student' resilience increases, their academic burnout decreases. Also supporting the current study, is the findings of Habib (2019) who reported that that academic resilience positively and significantly correlated with students' academic motivation and confidence. Dokobe et al's (2024) findings also agree the current study's findings that academic resilience positively and significantly correlated with students' school satisfaction, but however disagrees that the positive correlation is weak and not moderate as reported in the current study.

On the contributions of academic resilience, individual dimensions, to the interest of students in learning Biology, the analyzed results revealed that the three dimensions of academic resilience positively and jointly contributed to students' interest in Biology, significantly. Individually, the findings however revealed that only reflective and adaptive help seeking (RAHS) and negative effect and emotional response (NEER), on their own, were significant predictors, and not perseverance (P). This significant prediction by RAHS and NEER could be linked to their respective attributes of instilling in students the ability to examine their talents, limitations and actively seek guidance and support from others as well as acknowledging and controlling their feelings of anxiety, negative emotions, and optimism-pessimism, that positively influences their interest. The insignificant prediction by P reaffirms the already stated assertion that students may persevere in Biology because of career goals, not necessarily because of interest. The present findings concur with Chan et al.'s (2022) findings that the dimensions

of academic resilience positively and jointly contributed to students' academic motivation. The study however disagrees with Chan et al. on their report that perseverance, individually, also significantly predicted students' academic motivation.

7. Conclusion and Recommendations

The study investigated the predictive influence of academic resilience and its dimensions on school students' interest in learning biology adopting a predictive correlational research design. Given the findings, the study affirmed that social intelligence and its dimensions are positive and significant contributors to school students' interest in Biology, except for perseverance which positively predicted student' interest in Biology although the prediction proved statistically insignificant. The study adds to existing body of knowledge that when academic resilience is fostered through when fostered through sensitization and counselling sessions, significantly enhances students' interest in learning Biology. The following recommendations were made, considering the findings:

1. Periodic trainings, counselling sessions, sensitization and orientation programmes should be organized by school counsellors, for students, to educate them on techniques that can be adopted to foster academic resilience.
2. Biology teachers, during the implementation process, should design classroom instructions to create atmospheres that are collaborative, interactive and friendly enough for students to express their affective learning through healthy emotional expressions.
3. Schools should organize workshops for parents, led by experienced psychologists and counsellors, to counsel them on how to help foster their children's resilience levels at home, as a positive and calming home environment during early childhood can enhance resilience among children in their later lives.

Acknowledgments

The authors acknowledge their instruments validators (ARS and BIS), the participants of the study, instructors and administrators of the sampled schools as well as all the researchers mentioned in the study.

Conflicts of Interest

The authors declare no conflict of interest.

Funding

This research received no external funding.

Ethics Approval and Informed Consent

Ethical clearance was obtained from the relevant institutional authority. Permission was secured from school authorities, and informed consent was obtained from participants and/or their guardians. Participation was voluntary and confidential.

References

Almulla, M. O. (2024). Academic resilience and its relationships with academic achievement among students of King Faisal University in Saudi Arabia. RGSA – Revista de Gestão Social e Ambiental, 18 (9), 1-17. DOI: https://doi.org/10.24857/rgsa.v18n9-134 ISSN: 1981-982X.

Amzil, A. (2022). Academic resilience and its relation to academic achievement for Moroccan university students during the covid19 pandemic. International Education Studies, 16 (1), 1-7. https://doi.org/10.5539/ies.v16n1p1

Anosike, O. C., & Okigbo, E. C. (2023). Academic resilience and emotional intelligence as predictors of secondary school students' performance and attitude towards physics in Enugu State, Nigeria. UNIZIK Journal of STM Education, 6(1), 92-98.

Awosika, O. F., & Okoli, J. N. (2023). Nurturing secondary school students' academic interest in biology using mind mapping instructional strategy. International Journal of Research and Innovation in Social Science (IJRISS), 7(10), 848-856.

Bittmann, F. (2021). When problems just bounce back: about the relation between resilience and academic success in German tertiary education. SN Social Sciences, 1(2), 65 - 75.

Chan, S. M., Delatina, A. C., Diego, A. R., Elarmo, F. J., Escollar, P. D. T., Esmeralda, E. Z. D., Esponilla, E. P., Esquilla, M. R. A., & Gamboa, M. S. (2022). Academic Resilience and Academic Motivation of Senior High School Students. A Research Paper Presented to the Faculty of Basic Education, Department Senior High School, Colegio San Agustin-Bacolod, Philippines.

Cassidy, S. (2016). The Academic Resilience Scale (ARS-30): A new multidimensional construct measure. Frontiers in Psychology, 7 (1787) 7-21. http://doi:10.3389/fpsyg.2016.01787

Creswell, J. W. (2012). Educational Research: Planning, Conducting, and Evaluating Qualitative and Quantitative Research (4th Ed.). Boston, MA: Pearson.

Dokobe, G., Wawire, C.K., & Olendo, R. A. (2024). Academic resilience and self-concept as correlates of school satisfaction among form two students in the North East Region of Botswana. International Journal of Research and Innovation in Social Science,8(8), 2765-2777.

Habib, H. (2019). Academic resilience as a predictor of academic motivation and academic confidence of secondary school students. Online Journal of Multidisciplinary Subjects (Peer Reviewed), 13 (1), 700-706.

Jumasih, (2023). Literature study: The influence of learning interest on student achievement. Humanities, Management and Science Proceedings, 4 (1), 1386 – 1392. ISSN (online): 2746 – 4482. http://www.openjournal.unpam.ac.id/index.php/SNH

Karabıyık, C. (2020). Interaction between academic resilience and academic achievement of teacher trainees. International Online Journal of Education and Teaching (IOJET), 7(4), 1585-1601. http://iojet.org/index.php/IOJET/article/view/1032

Luo, Z. Dang, Y., & Xu, W. (2019). Academic interest scale for adolescents: Development, validation, and measurement invariance with Chinese students. Frontiers in Psychology, 10, 1-14.

Mbaegbu, C.S., Nwuba, I.S., & Akachukwu, E.E. (2023). Effect of Ethnobiology Instructional Approach on Secondary School students' Interest in Biology Concepts in Onitsha Education Zone. Unizik Orient Journal of Education, 10(1), 177-185.

Mwangi, C. N., Ireri, A. M., Mwaniki, E. W., & Wambugu, S. K. (2018). Relationship among type of school, academic resilience and academic achievement among secondary school students in Kiambu County, Kenya. PEOPLE: International Journal of Social Sciences, 3(3), 1092–1107. http://doi.org/10.20319/pijss.2018.33.10921107

Nandal, N., Nandal, N., & Milind, (2021). Correlation between resilience and academic achievement of higher secondary scheduled caste students. Journal of Contemporary Issues in Business and Government, 27 (5), 4524-4533. http://DOI:10.47750/cibg.2021.27.01.344

Nwafor C. E., & Oka, O. O. (2018). Secondary school students' interest inventory in biology. International Journal of Humanities Social Sciences and Education (IJHSSE), 5 (3), 44-59. ISSN 2349-0373 (Print) & ISSN 2349-0381 (Online) http://dx.doi.org/10.20431/2349-0381.0503005.

Nwuba, I. S., Egwu, O. S., Awosika, O. F., & Osuafor, A. M. (2023). Fostering secondary school students' interest in biology using numbered heads together cooperative instructional strategy. The Universal Academic Research Journal, 5(2), 48–56. https://doi.org/10.55236/tuara.1136342

Nwuba, I.S., Obikezie, M.C., Chinwe, J.C., Agbo, L.C., Mbaegbu, C.S., & Anyigor, C.P. (2024). The correlation between test anxiety and academic achievement in biology among secondary school students in Nigeria. International Journal of Education, 17(2), 133-140.

Obimalume, N. V. (2021). Effect of multiple intelligence-based instructional approach on students' interest in secondary school biology. Sapientia Foundation Journal of Education, Sciences and Gender Studies (SFJESGS), 3(2), 234 – 242. ISSN: 2734-2522 (Print); ISSN: 2734-2514 (Online).

Ojeleye, C. I., Adegbile, O. N., & Apanpa, T. (2023). Academic resilience and self-esteem as determinant of students' academic performance in Zamfara State. Milestone: Journal of Strategic Management, 3(2), 68-78.

Omaka, N. T. (2025). Emotional Regulation, Academic Coping Strategy and Cognitive Flexibility as Predictors of Secondary School Students' Achievement in Biology in Awka Education Zone. An unpublished dissertation submitted to the Department of Science Education, Faculty of Education, Nnamdi Azikiwe University, Awka.

Oyoo, S. A., Mwaura, P.M., & Kinai, T. (2018). academic resilience as a predictor of academic burnout among form four students in Homa-Bay County, Kenya. International Journal of Education and Research, 6 (3), 187-200.

Rachmawati, I., Astuti, B., & Kurniasari, M. (2024). Students' academic resilience: A descriptive study. Buletin Konseling Inovatif, 4(1), 55-60. http://doi:10.17977/um059v4i12024p55-60

Ramadhani, D. P., & Sagita, D. D. (2022). Academic resilience of students in the limited face to face learning period (PTMT). Journal of Innovation in Educational and Cultural Research, 3(4), 519–527. https://doi.org/10.46843/jiecr.v3i4.210

Shafiq, B., Ali, A., & Iqbal, H. (2024). Perfectionism, mattering and loneliness in young adulthood of Generation-Z. Heliyon, 10(1), e23330. https://doi.org/10.1016/j.heliyon.2023.e23330

Triarisanti, R., & Purnawarman, P. (2019). Interest and motivation on college students' language and art appreciation learning outcomes. International Journal of Education, 11(2), 130-1135. doi: 10.17509/ije.v11i2.14745