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Analysis of Students' Adversity Intelligence Quotient on Academic Performance in Primary Basic Science at Central Baptist Academy Kerang, Plateau State, Nigeria

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ABSTRACT **Original research paper**

The study investigated 'Analysis of Students' Adversity Intelligence Quotient on Academic Performance in Primary Basic Science at Central Baptist Academy Kerang, Plateau State, Nigeria' considering the control and ownership dimensions of Adversity Intelligence Quotient (AIO) of Primary IV pupils. Guided by three objectives and research questions respectively; tested three hypotheses in the study. Employed posttest only research design with a population of eighteen pupils and a sample of fourteen. Data were collected using Basic Science Adversity Quotient Questionnaire (BSAQQ) and Basic Science Performance Test (BSPT), after the instrument's validation by experts with r=0.85 for BSAQQ and r=0.78 for BSPT. Analysis of data collected was done using mean and standard deviation (descriptive statistic) for research questions and ANOVA (inferential statistic). Results from findings showed high level of both control and ownership of students AIQ yet there was no significant difference on pupils' performance in Central Baptist Academy Kerang. It was concluded that Although pupils exhibit adaptive and responsible behaviors, these characteristics alone may not directly impact academic achievement. Based on the findings of the study it was recommended among others that researchers should consider larger and more diverse samples across multiple schools to improve the generalizability of findings and increase statistical power and teachers should incorporate Social and Emotional Learning (SEL) practices to enhance pupils' overall adaptive behaviors in ways that align with academic tasks.

Keywords: Control and ownership dimension of AIQ, Primary basic science, Central Baptist Academy Kerang.

Introduction

Education is widely acknowledged as the foundation of human development. Globally, it enhances individuals' quality of life and social status, distinguishing humans from animals by enabling personal growth and societal progress. Through education, people gain knowledge, skills, and critical thinking abilities essential for navigating challenges, contributing to society, and achieving personal goals. It also fosters social cohesion and equality by offering opportunities to all, regardless of background (UNESCO, 2020; OECD, 2019; World Bank, 2018). Education is not just a tool for acquiring information but a transformative force that shapes societies, drives innovation, and promotes well-being. Scientific innovation, fueled by education, continues to determine

a nation's global standing. More advanced nations often lead in global policy and economic influence, while others follow or depend on them (Anderson, 2021; Patel & Chen, 2022; Roberts, 2020).

Basic science is critical subject in primary education, laying the foundation for future scientific literacy and problem-solving skills. Understanding factors influencing academic performance in basic science can help educators tailor interventions to support students. Adversity intelligence quotient, as a measure of resilience, may play a significant role in students' ability to navigate challenges in learning basic science (Tripathi and Bajpai, 2022). Influential factors include individual determination, coping strategies, teacher-student interactions, classroom environment, and socio-economic status. One factor that has been under explored for students' success is the Adversity Intelligence Quotient (AIQ), also influences success in every area of human endeavor. AIQ reflects a student's capacity to overcome challenges and maintain focus on goals. Integrating AIQ into education can help students build resilience, improve coping skills, and drive academic success through exposure to challenging tasks and guided support.

Adversity Intelligence Quotient (AIQ) offers a compelling framework for understanding students' capacity to withstand and overcome academic and personal challenges, especially within complex subjects like at elementary level like basic science. Introduced by Stoltz (1997), AIQ comprises fourdimensions Control, Ownership, Reach, and Endurance (CORE) which collectively determine an individual's resilience level and response to adversity. These dimensions provide a robust lens for analyzing students' academic outcomes, particularly in the elementary schools such as Central Baptist Academy Kerang, Plateau State, Nigeria where students face multifaceted educational barriers.

Control reflects the degree to which students believe they can influence the outcomes of adverse situations (Singh & Parveen, 2018). In Primary basics science learning, high control AIQ is associated with better emotional regulation, sustained focus, and proactive learning strategies (Matore et al., 2020). Studies by Tripathi and Bajpai (2022) and Mwivanda and Kingi (2019) have shown that students with high control are more resilient and academically successful. However, results are mixed as Yazon (2019) and Wang et al. (2021) reported negative correlations in some contexts, suggesting cultural and situational influences may moderate the control-achievement relationship.

Ownership indicates the extent to which students take personal responsibility for their academic outcomes. High ownership students are solution-oriented, engage in self-reflection, and actively modify learning strategies (Suryandari& Yuliana, 2023; Tripathi & Bajpai, 2022). Research shows ownership correlates positively with academic performance (Mwivanda, 2020; Espanola, 2016). In Primary basic science, where problem-solving and independent inquiry are crucial, ownership becomes a predictor of persistence and conceptual understanding.

Several studies have highlighted the relevance of AIQ in academic contexts. For example, Napis (2018) reported that AIQ had a stronger predictive influence on Physics problem-solving than self-efficacy. Hanifah et al. (2021) confirmed the joint influence of AIQ and student attitudes on Physics achievement. However, these studies either failed to dissect the individual CORE components or used designs such as experimental or path analysis. The present study, by contrast, uniquely adopts posttest only research design and explores the control and ownership sub-variables of AIQ in Primary IV basic science at Central Baptist Academy kerrang, Plateau State where such studies are lacking.

Statement of the Problem

We live in society nowadays where several challenges and hardship abound, such as insecurity, hunger, high cost of living standard and natural disasters like flood, wild fire, earthquakes etc. which has the potential of impacting on student's concentration on learning outcomes as in case of Plateau State plagued with insecurity. This necessitate the research to explored how students' cope with challenge, obstacles and yet do well in school academically. There is need to understand how student's adversity intelligence quotient affects their academic performance in basic science, particularly in the context of Central Baptist Academy Kerang. Limited research exists on the analysis of AIQ and academic performance in Primary IV basic science education. Given Primary basic sciences vital role in national development, countries must not only invest in the grassroot subject but also ensure high students' achievement. Despite its importance for both national progress and future progression in science education like Physics, Biology, and Chemistry.

Several factors contribute to the inconsistent performance in primary basic sciences, including inadequate trained teachers, poor funding, limited materials and equipment, lack of teacher training programs, and ineffective teaching methods. However, the continued disparity despite interventions suggests these are not the sole causes. Some students still perform well under the same conditions, indicating the need to explore internal factors like students' adversity intelligence quotient, comprising control and ownership. Students who control themselves and take responsibility are more likely to achieve academically. Thus, this study aims to examine the analysis of students' adversity intelligence quotient on Primary basic science academic performance in Central Baptist Academy Kerang, Mangu, Plateau State, Nigeria.Specifically, the study was set to determine: (i) Control as a component of Adversity Intelligence Quotient (AIQ) on primary basic science academic performance in Central Baptist Academy Kerang. (ii) Ownership AIQ on primary basic science academic performance in Central Baptist Academy Kerang. (iii) control AIQ and ownership AIQ on primary basic science academic performance in Central Baptist Academy Kerang.

Literature Review

This study is grounded in HardinessTheory(Kobasa, 1979), explain why some individuals remain healthy and perform well under high stress, while others become overwhelmed. Hardiness is a personality trait that acts as a buffer against stress. It enables individuals to remain resilient and effective in challenging or adverse situations. Hardiness is often referred to as a resilienceenhancing trait that helps people turn adversity into growth opportunities. Kobasa identified three key components, often called the three Cs of Hardiness: (i). Commitment is the tendency to stay involved with tasks and relationships, rather than feeling isolated or disengaged and committed individuals see challenges (like studying basic science) as meaningful and worth their effort. (ii). Control is the belief that one can influence events and outcomes through effort and choices, students with a strong sense of control feel that their actions (like studying, asking for help, or practicing problems) will directly affect their academic performance. (iii). Challenge is viewing stress or change not as a threat but as an opportunity for growth and learning and instead of fearing failure in basic science, hardy students see it as a way to improve their knowledge and skills.

Hardiness as a resilience theory enhances coping abilities, encourages active problem-solving, and promotes psychological endurance. Kobasa maintain that individuals high in hardiness experience less stress-related decline and are more likely to thrive under pressure essentially a resilience process. Relating hardiness theory and academic performance in primary basic sciences, as sciences is often considered a difficult and partly abstract subject, requiring persistence, critical thinking, and emotional resilience. Here is how hardiness relates to academic success in primary basic science from the lens of the three Cs namely; commitment, control and challenge:

Commitment principles shows hardy students stay engaged with basic science tasks, even when they are difficult and they're more likely to attend class, complete assignments, and revise regularly. Control principle shows students who feel in control believe they can improve their performance through effort and instead of blaming failure on external factors, they take responsibility and adjust their study methods. And, challenge principle shows that hardy students see difficult topics on nature as opportunities to grow and they are less afraid of failure and more open to learning through mistakes.

For example, if a student receives a poor grade on a primary basic science exam, a low-hardiness student may feel helpless or demotivated and a high-hardiness student is more likely to analyze what went wrong, seek help, and try again demonstrating resilience in the face of academic adversity. Kobasa's Hardiness Theory (HT) offers a psychological framework for understanding how students can remain resilient and achieve academic success in challenging subjects like basic science. By fostering commitment, a sense of control, and a positive view of challenges, hardiness helps students persevere through academic struggles and ultimately perform better. Also, by fostering resilience and coping strategies in students, educators can help them develop the skills and approaches needed to overcome challenges and achieve academic success. Finally, integrating RT into this research can provide a basis for analyzing how adversity intelligence quotient relate to students' academic achievement by examining the two components of AIQ namely; control and ownership in this study, one can gain a deeper understanding of the dynamics at play in Primary IV

basic science learning in Central Baptist Academy Kerang, Plateau State, Nigeria.

Concept of Students' Intelligence Quotients

Intelligenceis a multifaceted concept involving the ability to learn, reason, solve problems, and adapt. Traditionally assessed through Intelligence Quotient (IQ) tests focused on cognitive abilities, modern theories now include Emotional **(**EQ**),** Spiritual **(**SQ**),** and AdversityQuotients **(**AQ**).** IntelligenceQuotient **(**IQ**),** developed by Alfred Binet (1904) and refined by Lewis Terman (1916), measures reasoning, problem-solving, memory, and processing speed. It is categorized into levels ranging from profoundly impaired to profoundly gifted. IQ influences learning and problem-solving in structured environments (Resing&Drenth, 2007).

Emotionalintelligence **(**EQ**),** introduced by Salovey and Mayer (1990) and popularized by Goleman (1995), reflects the ability to perceive, manage, and use emotions effectively. It includes five components: self-awareness, self-regulation, motivation, empathy, and social skills. EQ is a skill that can be learned and plays a crucial role in stress management, relationships, and workplace collaboration (Cherniss, 2010). Spiritualintelligence quotient (SQ), conceptualized by Covey (2004). Wolman (2012), refers to spiritual intelligence awareness of one's purpose, compassion, integrity, and meaning-making. It is not tied to religion but reflects a deeper sense of connection and values-based decision-making. AdversityIntelligenceQuotient **(**AIQ**)**, introduced by Stoltz (1997), measures resilience and the capacity to overcome adversity. Its four components Control**,** Ownership**,** Reach**,** andEndurance **(**CORE**)** indicate how individuals respond to stress and challenges. AIQ can be strengthened through self-awareness, emotional regulation, problem-solving, and social support (Hema & Gupta, 2015).

Adversity Quotient Intelligence (AIQ) describes one's ability to remain composed and effective in the face of challenges (Stoltz, 1997). It is the "fighting power" that helps turn setbacks into opportunities (Merianah, 2019; Srihartini et al., 2021). As Tripathi and Bajpai (2022) describe, it represents the science of human resilience. Research shows that high IQ and EQ alone do not guarantee success. Some individuals with strong cognitive and emotional abilities still struggle to persevere under pressure (Hema & Gupta, 2015). AIQ fills this gap, offering a better predictor of academic achievement, persistence, adaptability, and long-term success.

Napis (2018) studied the effects of **self-efficacy** and AIQ on physics problem-solving among 100 students, using questionnaire and tests. Results showed AIQ had a stronger influence (8.41%) than self-efficacy (4.92%) on problem-solving. Self-efficacy positively affected both AIQ and problem-solving. However, the study lacked clarity on population size and faced language barriers. Unlike the correlational design of the present study, Napis used quantitative path analysis.

Hanifah*et al*. (2021) examined AIQ and student attitudes on physics achievement in 12th graders at SMAN 10 Banjarmasin, Indonesia, using standardized questionnaires and statistical tests. Students showed very high AIQ, positive attitudes, and high achievement. Both AIQ and attitudes significantly influenced physics learning. Though the source of the instruments was not specified and minor terminology inconsistencies occurred, findings were satisfactory despite no separate analysis of AIQ components. The present study aims to investigate the AIQ's relationship to academic achievement.

Suryandari and Yuliana (2023) experimentally investigated AIQ's effect on natural science learning outcomes among 25 elementary students in Surabaya. Using AIQ questionnaires and tests analyzed via ANOVA, results confirmed a significant positive impact of AIQ on learning outcomes. The study recommended further research on AIQ components, strategies to boost AIQ, and longitudinal effects. The sample size and design were appropriate, though population details were absent. The present review seeks to explore AIQ and academic achievement relationships.

Rosiqoh*et al*. (2020) conducted a single case study of 30 tenth-grade students in Bandung to analyze concept understanding and AIQ regarding elasticity in physics. Using a post-test design with validated instruments, results showed generally low conceptual understanding and moderate AIQ levels. The study concluded that targeted interventions are needed to improve physics comprehension and AIQ. This differs from the current study.

Bakare (2015) researched AIQ and related factors as predictors of academic achievement in Nigeria's West African Senior School Certificate Examination, focusing on Mathematics and English.

AIQ positively predicted achievement, making it a key factor. The study highlights a lack of AIQ research related to physics in Nigeria, motivating the present research on AIQ's relationship with physics achievement among senior secondary students in Plateau State. It can be submitted therefore that only four studies were found on Physics related topics and academic performance which non used correlational survey design nor explore the sub variables of adversity intelligence quotient which makes the current study unique as no study of this type was traced by the researcher in Nigeria where Plateau State is situated, however some researchers have explore the variable adversity intelligence quotient in other areas and some has findings on the sub variables namely; control, ownership, reach and endurance. The next presentation reveals such studies.

Adversity Intelligence Quotient (AIQ) includes four dimensions: control, ownership, reach, and endurance (Stoltz, 1997). Control is a person's ability to manage situations, especially in problem-solving, reflecting the perceived influence over events (Tripathi & Bajpai, 2022). It affects effort, perseverance, resilience, health, and tenacity. High control scores mean better handling of adversity (Saguni et al., 2021; Mwivanda&Kingi, 2019). Control is linked to self-confidence, self-regulation, discipline, and willpower (Duckworth & Kern, 2011). Control is considered the most crucial CORE dimension because it determines the likelihood of meaningful action in challenges (Cornista&Macasaet, 2013). It reflects one's belief in managing and recovering from difficulties positively (Singh & Parveen, 2018; Matore et al., 2020). Those with high Control AIQ respond well to challenges and recover quickly, while those low in control often have negative thoughts and weak resilience. Studies show Control AIQ correlates positively with academic performance. Mwivanda and Kingi (2019) found a significant positive link between control and secondary school students' academic success. Honken et al. (2016) found self-control predicted 27%-42% of variance in freshmen engineering students' GPA, though it is not the major predictor. Mwivanda (2021) confirmed a strong positive correlation between control AIQ and academic performance.

However, Hidayati and Tarufik (2020) found no significant correlation between control AIQ and students' behavioral problems. Mohd and Mohd (2020) reported pre-service teachers' control AIQ at a moderate level. Tripathi & Bajpai (2022) found a strong positive correlation (r=0.61) between control AIQ and academic achievement among secondary school students in India. Conversely, Wang et al. (2021) found control AIQ negatively correlated with nursing students' coping styles in Macao. Yazon (2019) reported a negative correlation between control AIQ and mathematics proficiency among pre-service teachers. Suryadi and Santoso (2017) argued that poor control leads to misdirected actions harming performance. Hung et al. (2023) found a moderate positive correlation between control and ownership AIQ dimensions, indicating that higher control relates to greater responsibility. Overall, Control AIQ reflects the ability to regulate emotions and maintain focus during challenges (Matore et al., 2020). Literature shows mixed findings on Control AIQ, with underrepresentation of secondary school students, particularly in physics topics in Nigerian schools, indicating a need for further study.

Ownership refers to how individuals perceive their role in problems. Tripathi and Bajpai (2022) describe it as the degree of accountability one feels to improve adverse situations, influencing responsibility, engagement, and action. High ownership scorers accept responsibility, learn from experience, adjust strategies, and take action. Mwivanda and Kingi (2018) state that the Ownership Adversity Intelligence Quotient (OAIQ) reflects how much a person avoids blaming others or themselves excessively. Singh and Parveen (2018) view OAIQ as the level of one's active involvement in improving conditions. Suryandari and Yuliana (2023) define OAIQ as recognizing one's role in problems, those with low OAIQ often wrongly blame themselves, while those with high OAIQ accept responsibility and seek solutions. Stoltz (1997) explains OAIQ as the degree to which one rightly attribute adversity to oneself, triggering useful remorse. Matore et al. (2020) add that OAIQ involves identifying the root cause of challenges and recognizing their consequences, fostering accountability. Students with high OAIQ can articulate causes and impacts of problems, while those with low OAIQ are often confused, dismissive, or in denial, leading to uncertainty.

Tripathi and Bajpai (2022) found a strong positive correlation ($r = 0.61$, $p < 0.05$) between OAIQ and academic achievement in Indian secondary school students. Widyastuti (2015) observed that high-OAIQ students rarely complain, re-evaluate results, and show persistence in science learning. Espanola (2016) found that among AIQ components, only ownership

significantly related to academic performance. Similarly, Suryandari and Yuliana (2021) reported AIQ significantly influenced elementary students' science learning outcomes. Mwivanda (2020) also found OAIQ positively impacted academic performance in Nigerian secondary schools. Mohd and Mohd (2020) noted high OAIQ levels among pre-service teachers in Malaysia. Conversely, Wang et al. (2021) reported a negative correlation between OAIQ and coping styles among Macao nursing students. Garcia and Martin (2022) observed that low-OAIQ individuals often blame external factors, leading to passivity. However, Roberts & Lee (2021) suggest that practices like goal-setting, self-reflection, and accountability can strengthen OAIQ. It is submitted therefore that, OAIQ reflects a mindset of full responsibility for one's actions and consequences in achieving life goals.

Napis (2018)studied the effects of self-efficacy and AIQ on Physics problem-solving. The research was necessitated based on the low problem solving of Physics, caused by self-efficacy and adversity quotient. Using a quantitative survey with path analysis and a sample of 100 randomly selected students, results indicated that AIQ (path coefficient = 0.290; 8.41%) had a stronger influence than self-efficacy (0.222; 4.92%) on problem-solving. Self-efficacy also indirectly affected performance through AIQ. However, limitations include lack of disclosed population and partial translation from the original language. Unlike Napis' path analysis design, the present study adopts aposttest only with three hypotheses and will used BSAQQ and BSPT for data collection.

Hanifah, et al. (2021)examined AIQ and student attitudes' effect on Physics achievement among 12th graders at SMAN 10 Banjarmasin, Indonesia. The study used four objectives to guide the research with two research hypotheses tested at 0-05 level alpha significance, using an ex post facto design and random sampling, data from standardized questionnaires were analyzed via ANOVA. Results showed students had high AIQ (mean = 69.11), positive attitudes (77.17), and high Physics scores (95.98). AIQ and attitudes significantly influenced achievement. A limitation was the absence of the instrument source and inconsistent labeling of the subject as "physical" instead of "physics." Unlike this study, the current research will analyze AIQ using ANOVA with simple random sampling of Primary IV in Central Baptist Academy Kerang, in Plateau State, Nigeria.

Suryandari and Yuliana (2023) studied the effect of Adversity Quotient (AIQ) on natural science learning outcomes in elementary school students, a study conducted in Surabaya, Indonesia. The study adopted an experimental approach to investigate the impact of Adversity Quotient (AIQ) on natural science learning outcomes. The participants in this study were 25 students from class IV MI MiftahulFiqhiyyah. The selection of class IV (purposive sampling) was based on interviews conducted with the homeroom teacher, considering the varying levels of understanding among the students as evident from their daily science test scores. Data from AIQ questionnaires and outcome tests were analyzed with ANOVA in SPSS. Findings revealed AIQ significantly affected learning outcomes ($F = 2.049 > F$ table $= 4.28$), leading to rejection of Ho. Recommendations included investigating which AIQ factors affect science learning, developing resilience-building strategies, and conducting longitudinal studies. The present study, however, focuses on Primary IV pupils in Central Baptist Academy kerrang, Plateau State, using a posttest only research design and two instruments (BSAQQ & BSPT).

Rosiqohet al. (2020) studied analysis of senior high school students' ability to understand concept and adversity quotient on elasticity. A study conducted in high school in Bandung, Indonesia. This study aimed to determine the ability to understand the concept and adversity quotient of tenth-grade students on elasticity. This research is a single case study where the purpose of the study is to examine the conditions and situations that are happening, thus providing a picture based on facts found in the field. The study adopted post-test only group design. Data analysis techniques using the Rasch model with a research sample of 30 students consisting of 11 male students and 19 female students. The instrument used in this study was a test of concept comprehension ability with multiple choice questions of 15 questions ($r = 0.62$) for reliability coefficient and an adversity quotient questionnaire with an Adversity Response Profile (ARP) questionnaire of 20 statements ($r = 0.77$). The results showed that in general the ability to understand concepts in each concept was low and the adversity quotient also showed that the majority of students had moderate fighting power (camper). The present study was conducted with Primary IV pupils' using posttest only research design with seven questions and hypotheses respectively to guide the study. The former study was conducted in high school in Bandung, Indonesia while the present study was conducted in

Central Baptist Academy Kerang, Plateau State, Nigeria which distinguish the former from the present research.

Research Questions

This study will be guided by the following questions:

i. What is the level of control, as a component of the Adversity Intelligence Quotient (AIQ) on primary basic science academic performance in Central Baptist Academy Kerang.
ii. What is the level of ownership, as a component of AIQ on primary basic science academic performance in Central Baptist Academy Kerang.
iii. What is the level of control and ownership AIQ on primary basic science academic performance in Central Baptist Academy Kerang.

Hypotheses

This study was tested by the following hypotheses at 0.05 level of alpha:

H_{01}: There is no significant difference between control, as a component of the Adversity Intelligence Quotient (AIQ) and primary basic science academic performance in Central Baptist Academy Kerang.

H_{02}: There is no significant difference between ownership, as a component of AIQ and primary basic science academic performance in Central Baptist Academy Kerang.

H_{03}: There is no significant difference between control and ownership AIQs and primary basic science academic performance in Central Baptist Academy Kerang.

Methods

The study employed a post-test only research design, as the researchers did not manipulate any variables but examined existing conditions (students adversity intelligence quotient) and effect on academic performance. The target population included eighteen Primary IV pupils in Central Baptist Academy Kerang, Mangu, Plateau State for 2024/2025 academic session as obtain from the school. Using random sampling fourteen Primary IV pupils (9males, 5 females) sampled for the study.Basic Science Adversity Quotient Questionnaire (BSAQQ) which had five items each on control and ownership: Measured Primary IV pupil's feelings on their levels of adversity intelligence with the following response modes Very High Level (VHL) = 5 points, High Level (HL) = 4 points, Moderate Level (ML) = 3 points, Low Level (LL) = 2 points and Very Low Level (VLL) = 1 point. Basic Science Performance Test (BSPT) had twenty multiple choice items on elementary science. Both instruments were validated by experts. Reliability coefficient was 0.85 for BSAQQ using Cronbach Alpha and BSPT was 0.79 using Kr-20. Descriptive statistics (mean and standard deviation) addressed research questions using real limits of numbers for decision rule. Hypotheses were tested at 0.05 level of significance using ANOVA and ANCOVA to control for potential confounding variables and assess relationships.

Results

Results are presented in tables and interpretations followed immediately after;

Research Question One: What is the level of control, as a component of the Adversity Intelligence Quotient (AIQ) on primary basic science academic performance in Central Baptist Academy Kerang.

Answering Research Question One:

Table 1: Mean and Standard deviation for Level of Control AIQ on Primary Science Academic Performance.

s/no	Statement n=14	Mean	S. D	Remark
1	When something unexpected happens in my science experiment, I stay calm and find a solution.	9.86	5.52	HL
2	I think of ways to make my science experiment fairly accurate.	3.64	1.08	HL
3	I pay attention during science lessons not to get distracted.	3.21	1.31	ML
4	I think ahead to avoid problems in my science experiment.	3.79	1.31	HL
5	I take charge of my learning in science.	4.07	1.21	HL
	Total	4.91	2.09	HL

Key: n is number of participants, S. D, Standard Deviation; HL, High Level; ML, Moderate Level and LL, Low Level.

Table 1 examines the level of control AIQ on students learning outcomes among the Primary IV pupils. The overall mean score is 4.91 with a standard deviation of 2.09, indicating a High Level (HL). Such as I take charge of my

learning in science (Mean=4.07, S.D =1.21) and three other items reflect high level of control AIQ on basic science academic performance. I pay attention during science experiment not to get distracted (Mean = 3.21, S.D = 1.31) fall into moderate-level category. The overall result implies that level of control AIQ in improving student learning outcomes is not an issue, having high level among Primary IV pupils in Central Baptist Academy Kerang, Plateau State, Nigeria.

Hypothesis One

H_{01}: There is no significant difference between control, as a component of the Adversity Intelligence Quotient (AIQ) and primary basic science academic performance in Central Baptist Academy Kerang.

Testing Hypothesis Two

Table 2: Summary of ANOVA from Control AIQ and Primary Basic Science Performance

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	8.208[a]	5	1.642	.445	.806
Intercept	4.167	1	4.167	1.130	.319
Control AIQ	0.9**238**	**5**	0.9238	0**.2506**	.728
Error	29.507	8	3.688		
Total	152.000	14			
Corrected Total	37.714	13			

a. R Squared = .218 (Adjusted R Squared = -.271)

Table 2 shows F(5, 8) = 0.2506, p = 0.728>0.05, since P is greater than the alpha level. Therefore, the null hypothesis is not rejected. This indicates that there is no statistically significant difference between pupils' control component of AIQ and their performance in Basic Science.

Research Question Two: What is the level of ownership AIQ on primary basic science academic performance in Central Baptist Academy Kerang.

Answering Research Question Two:

Table 3: Mean and Standard deviation for Level of Ownership AIQ on Primary Science Academic Performance.

s/no	Statement n=14	Mean	S. D	Remark
1	If I make a mistake in science, I say sorry to fix it.	3.57	1.50	HL
2	I help my group do well in science projects.	3.07	1.44	ML
3	I think about what I did in science so that I can do better.	3.79	1.37	HL
4	I take care of science equipment.	3.14	1.41	ML
5	I am responsible for my science work.	4.00	1.11	HL
	Total	3.51	1.37	HL

Key: n is number of participants, S. D, Standard Deviation; HL, High Level; ML, Moderate Level and LL, Low Level.

Table 3 describes the level of ownership AIQ on students learning outcomes among the Primary IV pupils. The overall mean score is 3.51 with a standard deviation of 21.37, indicating a High Level (HL). Such as I take responsible for science work (Mean=4.00, S.D =1.11) and three other items reflect high level of ownership AIQ on basic science academic performance. I take care of science (Mean = 3.14, S.D = 1.41) and I help my group do well in science project (Mean=3.07, S. D=1.44) fall into moderate-level category. The overall result implies that level of ownership AIQ in improving student learning outcomes is not an issue, having high level among Primary IV pupils in Central Baptist Academy Kerang, Plateau State, Nigeria.

Hypothesis Two

H_{02}: There is no significant difference between control, as a component of the Adversity Intelligence Quotient (AIQ) and primary basic science academic performance in Central Baptist Academy Kerang.

Testing Hypothesis Two

Table 4: Summary of ANOVA from Control AIQ and Primary Basic Science Performance

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	11.442[a]	5	2.288	.697	.641
Intercept	.197	1	.197	.060	.812
Ownership AIQ		**5**	1.5078	**0.459**	.658
	1.5078				
Error	26.273	8	3.284		
Total	152.000	14			
Corrected Total	37.714	13			

a. R Squared = .303 (Adjusted R Squared = -.132)

Table 4 show F(5, 8) = 0.459, p =0 .658. Since p = .658 > 0.05, the null hypothesis is not rejected. This means ownership as an AIQ component does not significantly affect pupils' achievement in Basic Science.

Research Question Three: What is the level of control and ownership AIQ on primary basic science academic performance in Central Baptist Academy Kerang.

Answering Research Question Three

Table 5: Summary of ANOVA from Control and ownership AIQs on Primary Basic Science Performance

s/no	Statement n=14	Mean	S. D	Remark
1	If I make a mistake in science, I say sorry to fix it.	3.57	1.50	HL
2	help my group do well in science projects.	3.07	1.44	ML
3	I think about what I did in science so that I can do better.	3.79	1.37	HL
4	I take care of science equipment.	3.14	1.41	ML
5	I am responsible for my science work.	4.00	1.11	HL
6	If I make a mistake in science, I say sorry to fix it.	3.57	1.50	HL
7	help my group do well in science projects.	3.07	1.44	ML
8	I think about what I did in science so that I can do better.	3.79	1.37	HL
9	I take care of science equipment.	3.14	1.41	ML
10	I am responsible for my science work.	4.00	1.11	HL
	Total	3.51	1.37	

Key: n is number of participants, S. D, Standard Deviation; HL, High Level; ML, Moderate Level and LL, Low Level.

Table 5 shows the level of control and ownership AIQ on students learning outcomes among the Primary IV pupils. The overall mean score is 3.51 with a standard deviation of 1.37, indicating a High Level (HL). Such as I am responsible for science work (Mean=4.00, S.D =1.11) and six other items reflect high level of ownership AIQ on basic science academic performance. I take care of science (Mean = 3.14, S.D = 1.41) and I help my group do well in science project (Mean=3.07, S. D=1.44) two other items fall into moderate-level category. The overall result implies that level of ownership AIQ in improving student learning outcomes is not an issue, having high level among Primary IV pupils in Central Baptist Academy Kerang, Plateau State, Nigeria.

Hypothesis Three: There is no significant difference between control and ownership AIQs and primary basic science academic performance in Central Baptist Academy Kerang.

Testing hypothesis Three

Table 6: Table 4: Summary of ANOVA from Control, ownership AIQs and Primary Basic Science Performance

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	30.751[a]	10	3.075	1.325	.456

Intercept	.003	1	.003	.001	.975
Control and Ownership AIQ	**6.5307**	**10**	6.53058	**2.8137**	.378
Error	6.963	3	2.321		
Total	152.000	14			
Corrected Total	37.714	13			

a. R Squared = .815 (Adjusted R Squared = .200)

Table 6 show F(10, 3) = 2.8137, p = .378. With p = .378 > 0.05, the result is not statistically significant, and the null hypothesis is not rejected. Control and ownership AIQ combined do not significantly influence pupils' academic performance in Basic Science.

Discussion of Findings

The findings across all three hypotheses revealed that there is no statistically significant relationship between components of Adversity Intelligence Quotient (control and ownership) and academic performance in Basic Science among Primary IV pupils. Although the mean ratings of both control (4.91) and ownership (3.51) showed that pupils generally exhibited high levels of these traits as a reinforcement of the studies conducted by (Yazon, 2019; Mohd&Mohd, 2022), these did not translate into statistically measurable differences in performance outcomes.This outcome suggests that while pupils may demonstrate resilient behaviors or a sense of responsibility, such traits may not independently determine academic success sespecially in a cognitive domain like basic science, which may be influenced more strongly by cognitive ability, instructional quality, or environmental factors.

Furthermore, the relatively small sample size (n = 14) could have affected the statistical power of the analysis, potentially obscuring subtle effects that a larger sample might reveal. The low adjusted R-squared values, especially negative values in hypotheses one and two (-.271 and -.132, respectively), further indicate that the AIQ components did not explain a meaningful proportion of the variance in performance. These findings align partially with literature that suggests adversity intelligence contributes to academic persistence and coping, but may not always be a strong predictor of immediate academic outcomes in structured settings (Honken, et al. 2016).The study examined the relationship between two components of Adversity Intelligence Quotient dimension of control and ownership and academic performance in basic science. Findings revealed that while pupils displayed high levels of control and ownership, these traits did not significantly influence their academic achievement as a variant to the studies carried by Suryandari and Yuliana (2023). All three null hypotheses were retained at the 0.05 significance level, indicating no statistically significant effects.

Conclusion

This study concludes that control and ownership components of Adversity Intelligence Quotient do not significantly influence academic performance in Basic Science among Primary IV pupils in Central Baptist Academy, Kerang. Although pupils exhibit adaptive and responsible behaviors, these characteristics alone may not directly impact academic achievement. It is likely that a combination of emotional, cognitive, pedagogical, and contextual factors jointly affects learning outcomes at this level.

Recommendations

Based on the findings of the study it was recommended among others that:

1. Researchers should consider larger and more diverse samples across multiple schools to improve the generalizability of findings and increase statistical power.
2. Future research could use longitudinal approaches to explore whether adversity intelligence has delayed or long-term effects on academic achievement.
3. Educators should be trained to recognize and support adversity intelligence in the classroom but should not rely solely on it as a predictor of academic success.

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