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LOCUS OF CONTROL AND TEST ANXIETY AS CORRELATES OF STUDENTS' ACADEMIC ACHIEVEMENTS IN BASIC SCIENCE

Nwanneka Oluchukwu Christian-Ike (no.christian-ike@unizik.edu.ng)
Prof. Josephine Nwanneka Okoli (jn.okoli@unizik.edu.ng)
Dr. Adaeze Chike- Okoli (adaezeeo@gmail.com)

ABSTRACT

Basic Science is one of the preparatory subjects offered to students from Basic 1 -9 classes in Nigeria system of education to inculcate scientific literacy. Despite the importance of Basic Science, the academic performance of the students in Basic Science continues to be poor. Poor performance in Basic Science has been attributed to external forces that create anxiety among students. The purpose of the study was to examine the relationship between locus of control and test anxiety in Basic Science. Four hundred and fifty Basic 9 students from Awka Education Zone of Anambra State, participated in the study. The instruments used were Basic Science Students' Locus of Control Scale (BSSLOCS) and Basic Science Students' Test Anxiety Inventory (BSSTAI). Result revealed a negative correlation between the students' locus of control scores and academic achievements and the students' test anxiety scores and their academic achievements scores in Basic Science. There was a statistically significant correlation among Basic 9 students' locus of control scores, test anxiety scores and their academic achievement scores in Basic Science. It was recommended among others that school managers and teachers should nurture the mind-set of the students by organizing counselling classes and seminars on test anxiety and locus of control, their effect and management, at the beginning of each session.

Introduction

Basic Science, formerly known as Integrated Science, is defined as a unified science which aims at presenting a holistic view of science concept (Nwanneka & Josephine, 2021). It encompasses the various concepts of sciences. Basic Science is one of the preparatory subjects offered to students from Basic 1 -9 classes in Nigeria system of education to inculcate scientific literacy. It lays the foundation for core science subjects like physics, chemistry and biology and other core science courses at tertiary level of education. According to Danmole (2011), Basic Science is the presentation of holistic picture of science and technology content to the learners. This indicates that Basic Science subject is the root of all modern sciences and technology globally. Despite the importance of Basic Science, the academic performance of the students in Basic science continues to be poor (Nwanneka& Josephine, 2021). The issue of unsatisfactory academic performance in the recent Basic Education Certificate Examination (BECE) had led so many researchers to seek ways to improve the academic performance of the students. Several factors have been attributed to the dismal performance of students in Basic

Science (Ochu & Marina, 2015). Some of these factors include poor observation skills, poor teaching strategies, large class size and lack of innovative teaching techniques by the teachers. Kapur (2018) in his study posited that academic performance could be influenced by achievement motivation, locus of control, teaching styles among others. Much research has been conducted using some of the psychological variables and their relationship to Basic Science students' academic achievements, but it was observed that there is few or no empirical study on the correlation among Locus of Control, Test anxiety and students' academic achievements in Basic Science in Awka Education Zone.

Locus of control is the extent to which individuals believe their lives are controlled by their efforts or by fate. It is individual perception to the Locus of events as internally determined by his or her own behavior versus fate, luck, or external circumstances (Sagone & Maria, 2014). Amaku and Nanjwan (2019) viewed locus of control as a psychological construct. This implies that Locus of Control is a construct that allows people to either take responsibility for their actions and outcomes in life or blame external factors like fate, luck, or chances. According to Cherry (2020), locus of control could be internal or external depending on the belief system or motivations of people in expecting their outcomes.

Internal locus of control can be defined as a belief system that one has control over one's act to maximize the expected outcomes and minimize the bad or negative results or outcomes (Nwanneka & Josephine, 2021). It is a belief system that one can achieve an experienced outcome when one puts in efforts. Internal locus of control is always seen when an expected outcome is not achieved. A person with an internal locus of control tends to blame himself or herself when an expected outcome is not achieved and believes more efforts can yield a better result. This is unlike one who has external locus of control. External locus of control is defined as a belief system that one is at the mercy of fate, God, and chances to achieve an expected outcome. People that exhibit external locus of control tend to be helpless and not in control of their success and failure but blame people, fate, and destiny when an expected outcome is not achieved. Kutanis et al. (2011) opined that locus of control plays an important role for students to sustain the efficacy and usefulness of learning performance.

Test anxiety refers to worry, apprehension, palpitation, increase in pulse rate and other physiologic symptoms during the exam (Vitasari et al., 2010). It is a psychological condition in which people experience extreme distress and anxiety in testing situations (Cherry, 2020). According to George &Sarason (1952) who developed the test anxiety theory, it was noted that anxiety present in testing situation is an important determinant of test performance. It was elaborated that an individual that is highly anxious during exams is typically to score poorly in the exam. Cherry (2021)

highlighted that test anxiety can be developed because of anxiety produced interference responses generated from person's anxious state. A student tends to forget what he or she studied due to anxiety interference during examinations. Dephil et al. (2011) believed that anxiety arises to prepare a person for threats thereby distributes some symptoms like increased heartbeat, stress hormone section, restlessness, vigilance, and fear of a potentially dangerous environment. Some symptoms include excessive sweating, nausea, vomiting or diarrhea, stomach pain, rapid heartbeat, among others. Test anxiety is observed to be common to students especially during exam taking.

This study investigates whether Locus of control and Test anxiety influence students' academic performance in Basic Science in Anambra State, Nigeria.

Purpose of the study

The aim of this study is specifically to determine the:

1. Correlation between Locus of control scores and academic performance scores in Basic Science
2. Correlation between Test anxiety scores and academic performance scores in Basic Science
3. Correlation among Locus of control, Test anxiety and academic performance scores in Basic Science.

Research Questions

1. What is the correlation between students' Locus of control scores and their academic achievements scores in Basic Science?
2. What is the correlation between students' test anxiety scores and their academic achievements scores in Basic Science?
3. What is the correlation between students' Locus of Control scores, test anxiety scores and academic achievements scores in Basic Science?

Method

The research design adopted for the study is correlation survey. The study was carried out in Awka Education Zone of Anambra State. The area was selected because of the relatively few studies on the variables in Basic Science. The population of the study comprised all 6198, Basic 9 students in Awka Education Zone. Using purposive and disproportionate stratified random sampling technique, the sample size of 450 students was drawn from 15 out of the 48 co-educational schools in the Zone.

Instrument

The instruments used for data collection were Basic Science Students' Locus of Control Scale (BSSLCS) and Basic Science Students' Test Anxiety Inventory (BSSTAI) adapted from Craig et al. (1984) and Spielberger (1980) respectively. BSSLCS consists of 17 items statement measuring both internal and external Locus of Control. The scale relates to the personal control factor of Rotter I-E scale. BSSTAI is a 20-item statement measuring anxiety. These instruments were validated by experts and reliability coefficients established using

Cronbach Alpha coefficients. BSSLCS was found to be 0.68 and BSSTAI was 0.77. The questionnaires were administered to the sampled Basic 9 students with the help of research assistants. The student's promotion results for 2021/2022 academic session were also collated and recorded. The data was analyzed using Pearson Product Moment Correlation.

Results

Research Question 1: What is the correlation between Basic 9 students' locus of control scores (internal and external loci of control) and academic scores in Basic Science?

Table 1: Pearson correlation coefficient (r) on Locus of Control scores and students' academic achievement scores in Basic Science

Sources of Variance	N	Locus of Control (r)	Performance (r)	Remark
Performance	450	-0.21	1.00	weak negative correl.
Locus of Control	450	1.00	-0.21	weak negative correl.
Internal scores	80	1.00	0.02	weak positive correl.
External scores	370	1.00	0.00	no / negligible correl.

Table 1 reveals correlation coefficients(r) of **.02,.00 and -.21** on internal locus of control, external locus of control and cumulative locus of control scores on students' academic achievement respectively. It shows that a weak positive correlation existed between internal locus of control (r=.02) and academic performance scores. There is no correlation between external locus of control (r=.00) and academic achievement scores. A weak negative correlation existed between students' locus of control scores (r= -.209) and their academic achievement scores in Basic Science.

Research Question 2: What is the correlation between Basic 9 students' test anxiety (low and high anxiety) scores and their academic achievement scores in Basic Science?

Table 2: Pearson correlation coefficient (r) on Test Anxiety scores and students' academic achievement scores in Basic Science

Sources of Variance	N	Locus of Control (r)	Performance (r)	Remark
Performance	450	-0.097	1.00	weak negative
Test Anxiety	450	1.00	-0.097	weak negative
Low Test Anxiety	140	1.00	-0.273	weak negative
High Test Anxiety	310	1.00	-0.060	weak negative

Table 2 reveals correlation coefficients(r) of .273, 0.060 and - 0.097 on low test anxiety, high test anxiety and the cumulative test anxiety scores on students' academic achievement respectively. It shows that a weak negative correlation existed between low test anxiety (r=-0.273) and academic achievement scores. There is also weak negative correlation between high test anxiety (r=.060) and academic performance scores. A weak negative correlation existed between students' test anxiety scores (r= -.097) and their academic achievement scores in Basic Science.

Research Question 3: What is the correlation among Basic 9 students' locus of control scores, test anxiety scores and their academic **achievement** scores in Basic Science?

Table 3: Summary of Multiple regressions among Locus of Control scores, Test Anxiety scores and students' academic achievement scores in Basic Science

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	76.737	5.310		14.451	.000

Model	R	R Square	Adjusted R- Square	Remark
1	.209	.044	.040	Weak positive correlation

	Locus	-.410	.102	-.203	-4.012	.000
	Test anxiety	-.017	.054	-.015	-.305	.760

a. Dependent Variable: SCORE

The multiple correlation coefficient R = .209 in Table 3 suggests that students' locus of control scores and test anxiety scores with their academic **achievement** have a positive weak correlation. The R-square value of 0.044 shows that the independent variables (locus of control and test anxiety) explain 4% of the variability of the dependent variable (academic achievement).

Discussion

The findings of the study in table 1 showed that internal locus of control has a weak positive correlation with the students' academic achievement (r=0.02) while the external locus of control has a coefficient (r= 0.00) which indicates no correlation though the correlations are not significant. Generally, the coefficient of locus of control scores (r= -0.02) with the students' academic achievement showed a significant weak negative correlation. These imply that students that have internal locus of control achieve more academically while those that are externally locus controlled are not being affected academically. It is evident from the findings that when students' locus of control scores decreases (internal), the students achieve higher but when the locus of control scores increases (external) the students are not academically influenced. This indicates that believe in luck, chances and destiny does not influence academic performance either positively or negatively but believe in self - effort or hard work boosts academic performance. Thus, internal locus of control has a positive influence on academic achievement.

The findings of the study agree with the study of Okeke & Ukoh (2020), who found that there is a correlation between locus of control and academic achievement of students in Physics. Muthoni, Isoe & Mwaura (2020) also found that there is a negative correlation between locus of control and academic achievement in Physics. The study also supported the views of Amalu & Nanjwan (2019), that internal locus of control had influence on students' academic achievement in Mathematics. Similarly, Samayalangki & Yodida (2017) indicate that there is a positive correlation between internal locus of control and academic achievements. Choudhury & Borooah (2017) found that there is a positive significant correlation existing between internal locus of control and students' academic achievements among the Arts and Science Streams undergraduates. The study disagrees with the findings of Sidhu (2018) that there is no correlation between locus of control and academic achievement. This difference might be as a result of students' field of study and environment.

The findings of the study in Table 2 showed that students' low level of test anxiety has a significant weak negative correlation (r= - 0.273) with their academic achievement while high level of test anxiety has a coefficient of (r= -0.060) which makes a non- significant weak negative correlation with academic achievement. Generally, test anxiety has a significant negative correlation (r = -0.097) with students' academic achievement. These imply that when students' level of test anxiety is high, the students' academic achievement is low and vice versa. From the findings, students that worry and palpitate before or during an examination had their academic achievement influenced negatively while those that had less worry, fear or panicky achieve higher. Thus, test anxiety has a negative influence on students' academic achievement.

The findings of this study support the findings of Akanazu & Okoli (2019) who revealed that test anxiety is negatively

related to students' achievements in Chemistry. Also, Akinleke (2012) found that there is a significant correlation between test anxiety and GPA. The findings of the study are also in line with DordiNejad *et al* (2011), who found that test anxiety has negative effect on students' academic performance. This implies that generally, test anxiety is negatively affecting academic achievements of students according to many researches {Sidhu (2018); Nasir,Sajjad & Farooq (2018); Oludipe and Oludipe (2019);Muthoni, Isoe & Mwaura (2020)}.

The findings of the study reveal that there exists a low positive correlation between locus of control, test anxiety and academic achievement in Basic Science. This means that there is a correlation existing between locus of control and test anxiety with students' academic achievement in Basic Science. This shows that one that has high locus of control scores (externality) and high level of test anxiety will be academically affected negatively or vice versa. Students that believe in their selves and their abilities to maximise their outcome tends to be less anxious during examination which in turn influences their academic achievement. Thus, locus of control and test anxiety influences academic achievement of students in Basic Science.

The finding of the study is in line with that of Onyekuru & Ibegbunam (2014) who found that a weak but significant correlation exists between locus of control, test anxiety and academic achievement. Also, the finding of the study supports the findings of Akinleke & Adeaga (2014) that locus of control and test anxiety positively correlate with students' academic achievements. Muthoni, Isoe & Mwaura (2020) in his study found that locus of control and test anxiety correlate with students' academic achievements.

Conclusion

From the findings of the study, it is concluded that locus of control and test anxiety are negatively related to students' academic achievement. Students that have internal locus of control perform higher than those with external locus of control and also those having low level of test anxiety achieve more academically than those having a high level of anxiety. Also, locus of control and test anxiety jointly influences students' academic achievement in Basic Science.

Educational Implications of the Study

The study is aimed at finding the correlation that locus of control and test anxiety has on students' academic achievement in Basic Science. The major educational implication of the findings of this study is that academic achievement of the students is directly proportional to test anxiety and locus of control. The higher the level of test anxiety, the lower the academic achievement and the higher the locus of control scores (externality), the lower the academic achievement. Hence, when students believe more in themselves and their efforts to achieve success (internal) and as well prepares very well for examination,

there is tendency to improve in their academic achievement in Basic Science.

From the findings, the type of correlation existing between the male and female students test anxiety scores and their academic achievement scores in Basic Science is not significant. This implies that gender has no influence on students' academic achievement in relation to the students' test anxiety. Also, from the findings the type of correlation existing between the male and female students' locus of control scores and their academic performance scores in Basic Science is significant. This also implies that gender is a factor that contributes to the students' locus of control in relation to their academic performance.

It is therefore imperative that teachers, parents, school managements and guidance and counsellors need to expose the students to importance of self- motivation and self-confidence. Their mind set should be nurtured into believing in themselves. There is also a need to encourage the students to prepare very well for exam by ensuring that they attend classes and do their assignments. Students should be advised to always start answering test questions from the known questions to the unknown, to make a good academic outcome.

Recommendations

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

Teachers should nurture the mind-set of the students to be academic self-reliant to achieve success.

Teachers should be observant to identify the students with test anxiety for counselling intervention.

School management with the school guidance and counsellors should organize a counselling class or seminars on test anxiety and locus of control, their effect and management at the beginning of each session. Parents should create an enabling environment where their children are nurtured to be self-confidence and self-reliable as well cope with academic worries by engaging in home studies and practices.

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