



Self-esteem and Locus of Control as Correlates of Academic Achievement among Secondary School Students in Anambra State, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author ANA designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author JIU managed the analyses of the study and the literature searches. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJESS/2023/v47i11016

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/102386>

Original Research Article

Received: 04/05/2023
Accepted: 06/07/2023
Published: 18/07/2023

ABSTRACT

Aim: The present study aimed at the correlation between self-esteem, locus of control and academic achievement of secondary school students in Mathematics.

Study Design: Correlation Survey Research Design.

Place and Duration of Study: The study was conducted among senior secondary school students from the six education zones in Anambra state.

Methodology: This study was conducted among 18,297 senior secondary school students from the six education zones in Anambra state. The multistage sampling procedure was adopted to select a sample of 895 SS II students from Awka education zone. The instruments for data collection were; the self-esteem scale developed by Hare in 1975, the locus of control scale developed by Aston Trice in 1985. These instruments were examined and its usability and validity in Nigeria reported.

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The student's terminal results in mathematics were gathered in order to measure student's academic achievement scores in mathematics. The reliability of the instrument was as follows The Hare self-esteem scale was subjected to a test-retest reliability and indicated a good stability $r = .56$ to $.65$ for the three sub-scales and $r = .74$ for the general scale. The administration of the instrument was done through direct delivery approach. By this method, copies of the questionnaire were distributed personally to the respondents (SS II students) by the researcher with the help of the regular teachers from each school sampled, the teachers will be trained and enlightened on the research assistant's role. Data relating to research question 1 and 2 was analyzed using Pearson product moment correlation coefficient, while research question 3 was analyzed using simple regression analysis. The research hypotheses raised were analyzed using multiple regression analysis. Multiple regression analysis determined the R, R – squared and R2 adjusted. The significant value on the coefficient table was used to test hypotheses 1 – 4, while the R, R – square and R2 adjusted coefficients were used to establish the percentage correlation among self-esteem, locus of control and academic achievement.

Results: The study shows that a moderate positive relationship of 0.544 exists between male secondary school students' self-esteem and their academic achievement in Mathematics. The study also revealed that, there is a significant relationship between self-esteem and academic achievement of male secondary school students in Mathematics in Anambra State. Also, a low positive relationship of 0.336 exists between male secondary school students' locus of control and their academic achievement in Mathematics. There is a significant relationship between locus of control and academic achievement of male secondary school students in Mathematics in Anambra State. The results also revealed a moderate positive relationship of 0.562 exist among secondary school students' self-esteem, locus of control jointly with their academic achievement in Mathematics, similarly, there is a significant joint relationship among secondary school students' self-esteem, locus of control and gender with their academic achievement in Mathematics.

Conclusion: Based on the analysis, it was concluded that, the absence of self-esteem and locus of control among students can lead to early discouragement, and in turn propel/ lead to poor academic achievement in core subjects despite the relevance of these subjects to academic growth and development. This can result in lack of interest and perseverance at school tasks, and ultimately, they may find it easier to avoid potential damage that might occur due to attributing failures to their own fault or ability.

Keywords: Self-esteem; locus of control; secondary school; students; academic achievement; mathematics.

1. INTRODUCTION

“Secondary level of education in Nigeria is the education the child receives after primary education level and before the tertiary stage. Secondary education has its broad goals which is to prepare the individuals for useful living within the society and higher education. Subjects offered in these schools differ per class level, that is Junior Secondary schools and Senior secondary schools” [1]. “The senior secondary school shall be a comprehensive with a core-curriculum designed to broaden pupils' knowledge and the out-look. Core subjects offered at this level are English language, Mathematics, Biology, Chemistry, Physics among others. Particularly, this study will focus on Mathematics. Mathematics as a science subject has been regarded as an essential and integral part of science education whose importance is needed in everyday life, hence the Federal Government of Nigeria, The Federal

Government of Nigerian in her National Policy on Education placed Mathematics as a core subject all secondary school students must offer at both junior and senior secondary school certificate levels” [1]. “Thus, Mathematics is perceived as an essential precursor to success in modern society. The usefulness of Mathematics in science, technological activities as well as commerce, economics, education and even humanities is almost at par with the importance of education as a whole” [2]. Ampofo [2] further, stated that “in Nigeria, as in most countries, mathematics occupies a key place in junior secondary and senior secondary level as well as Colleges of Education (CoE), state and federal tertiary institutions curricula”.

“Mathematics is a compulsory subject for every learner at these levels; essentially, it is a gatekeeper and critical filter for further studies in the country. Overtime, it is observed that students' external examination result conducted

by examination bodies has maintained a steady decline” [2]. This situation is increasing at a very significant rate in several states of the federation particularly in Imo State. This has constituted serious worry for stakeholders in education sector, parents, teachers, school administrators, and the government but it is not clear whether factors like self-esteem and locus of control among other psychological factors could be a cause of the declining achievement recorded in Mathematics. According to Eduwem et al. [3], “such reasons have been that factors such as students’ factor, teachers’ factor, parental factor, schools’ factor, government factor, language problems, infrastructural problem, instructional strategy adopted by the teachers affects academic achievement in secondary schools. The issue of poor academic achievement in mathematics have prevailed despite its place as one of the core subjects recommended by the FRN in the National Policy on Education”.

Students’ academic achievement is described as the ability to study, retain and recall subject content and also communicate such knowledge orally or in written form during internal and external examinations. Kumar and Asha [4] supported this by positing that “academic achievement is the attained level of students functioning in school task such as shown by school marks. Furthermore, they stated that teachers in secondary schools measure the academic achievements of students with the aim of achieving desired educational goals and objectives. The realization of such objectives is the panacea for academic growth and development of the education system, hence if achievement corresponds with objectives, the systems existence is justified. Operationally, academic achievement refers to the level of attainment in various subjects as indicated by marks or grade points. More so, it is referred to as marks or grades obtained in subjects taught in school after an examination”.

According to Akunne and Anyamene [5], “less than 40 percent of the candidates who sat for public examination in Nigeria obtained up to credit passes in five subjects which are the minimum academic qualifications for admission into tertiary institutions in Nigeria almost every year”. Similarly, the West African Examination Council (WAEC, 2020) reported that “in May/June WAEC examinations 1,338,348 candidates representing 86.99 per cent obtained credits and above in a minimum of five subjects including English Language and Mathematics. This further revealed the performance state of

students when compared with the performance of 2018 which was 52.97 per cent, and in 2019 which was 59.22 per cent”.

According to Isangedighi [6], “observations have proven constant fluctuation in the academic achievement among secondary school students in the country and this is likened to behaviours such as indiscipline, drug addiction, poor socio-economic background of the parents, inadequate motivation on the part of students, lack of information, teachers’ nonchalant attitude to work”. In the same vein, Yoloye [7] stated that “theories of educational disadvantages and social cultural pathology have been most prominent in the explanation of poor academic achievement among students”. “However, a growing number of scholars rejected this view and opined that the problems of learning are the artifacts of discontinuities which has brought about the separation of learning from real life function and situation” [8].

Nevertheless, Anyamene et al. [9] stated that “academic achievement of students can be improved if certain factors are adequately addressed. This is because academic achievement is associated with other socio-psychological variables such as self-esteem, locus of control among others”. Raheem and Abdulkadir [10] supported this by stating that “many factors such as students’ self-esteem, locus of control, gender among others could be responsible for poor achievement of students in external examinations. Self-esteem is an essential component of good mental health and has drawn the attention of many researchers. Self-esteem as one of the psychological variables is a person’s overall evaluation or appraisal of his own work”. Sheslow [11] defined “self-esteem as how much one values himself or herself and how important one thinks he is. It encompasses beliefs and emotions, and the behaviour displayed by the person”. Vaughn et al. [12] in their study asserted that “poor academic achievement possess worry over self-esteem, self-concept, and self-efficacy. In addition, they opined that individuals with positive self-esteem generally feel as though they are worthwhile and deserve respect. It can be concluded that learners with low self-esteem lack the believe in themselves and ability to do well in school”.

According to Olsen et al. [13], “individuals could have only two types of self-esteem, which are high self-esteem and low self-esteem. People

who have high self-esteem generally feel good about their ability to participate in any academic activity, confident in social situations and happy. While students with low self-esteem lack confidence in themselves and may achieve less academically. This shows that students with high self-esteem have more self-confidence in their aptitude to be successful academically. They participate actively in class, ask questions, and are not passive during the teaching and learning process while low self-esteem students partake passively in class activities. They are always silent, inactive, and also exhibit a withdrawal or nonchalant attitude towards academic activities". In the same vein, Mamah et al. [14], further opined that "low self-esteem students do not involve themselves with anything that may expose their weaknesses or incompetence to others. Because of that and to avoid being called one thing or the other among their peers in class, they usually do not show or have interest in academic activities". Thus, Subon et al. [15] found in their study "on self-esteem and academic achievement: the relationship and gender differences of Malaysian University undergraduates and reported that self-esteem and academic success are statistically linked". Hence, in the context of this study, self-esteem can be deduced as the value students place on themselves which involves a feeling of self-worth, an attitude of approval or disapproval that indicates the extent to which students believe in themselves to be capable, significant and successful.

"Similarly, another psychological factor that could hinder the academic achievement of students is locus of control. Locus of control is referred to as the extent to which individuals believe that they can control events and causes of their actions. It is concerned with the question of whether or not an individual believes that his own behaviour, skills or internal disposition determine what reinforcements he receives and refers to a person's beliefs about control over life events" [16]. "Locus of control is divided into internal locus of control and external locus of control. Students with internal locus of control believe that the consequences of their behaviour are under their personal control and that they are effective in controlling their destiny and determining the occurrence of reinforcement, and feel personally responsible for the things that happen to them. While those with external locus of control believe that the outcomes of their performances in life are determined by forces beyond their control (fate, chance, luck, powerful

others and supernatural forces) and that they determine the occurrence of specified events. With respect to the nature and extent of the established relationships, in another study it was found out that internal locus of control was negatively associated with academic performance while external locus of control was positively associated with academic performance" [16].

Several studies have been conducted with the aim of establishing the relationship between psychological variables and student's academic achievement. Among others are, Ibeawuchi and Irluh [17] who carried out the study "on the relationship between self-esteem, locus of control and students' academic underachievement in Rivers State, Nigeria. The study adopted the correlational survey research design. Three research questions and three hypotheses guided the study. Purposive sampling technique was used to draw a sample of 240 students identified as underachievers. The instrument for data collection was a structured questionnaire whose reliabilities were statistically determined with Cronbach Alpha and reliability coefficients ranging from 0.51 to 0.74. The research questions were answered with mean and Pearson product moment correlation (r) while the null hypotheses were tested with special Z to determine the significance of r . A progressive matrix was used to identify students with high mental ability while Basic Education Certificate Examination results of 2016 which is a cumulative record of examination and continuous assessment scores of the students' three years in school, was used as a measure of students' academic ability. Based on the attained mental ability performance and academic achievement of the students, the academic underachievers were identified. The findings of the study revealed a very low relationship between self-esteem, internal locus of control, external locus of control and academic underachievement which showed no statistical significance".

In the same vein, Okafor et al. [18] carried out a study to "determine the relationship between students' self-esteem and their academic achievement in Imo state. The study adopted the correlational research design. Twenty-three secondary schools selected through purposive sampling technique with a total population of 6872 students were used in the study. The instrument used for measurement of student's self-esteem is Hare Self-esteem Scale. Data collected for the research questions were

analysed using summated scores and Pearson Product Moment Correlation Coefficient (Pearson r), while data relating to the null hypotheses were analysed by comparing the already established relationship index against the critical values at 0.5 level of significance. The result of the study revealed that students' self-esteem has positive significant relationship with their academic achievement in both English Language and Mathematics. The findings also revealed that there exists a significant positive relationship between secondary school students' self-esteem and their academic achievement in Imo state". Similarly, Alokun et al. [19] investigated "the difference between the academic performance of students with high self-esteem and students with low self-esteem. A descriptive research design of survey type was adopted for the study. Two null hypotheses guided the study. The population for this study comprised all public secondary school students in Ondo state. The sample consisted of 240 students from six randomly selected schools. A questionnaire tagged 'Academic Performance Questionnaire' was used to collect data. Expert judgements were used to ensure face and content validity. Test-retest method was used to determine the reliability and a reliability coefficient of 0.72 was obtained. Data collected were analyzed by using t-test. The result revealed that there is a significant difference in the academic performance of students with high self-esteem and students with low self-esteem. Based on the findings of study it was recommended that parents should assist their children to see themselves in a positive light. They should also desist from belittling their children and doing things that can deflate their self-esteem"

More so, Thangal et al. [20] investigated locus of control of underachieving secondary school students in Lakshadweep. The study adopted the descriptive design. Six hypotheses were tested at 0.05 level of significance. The population of the study comprised of all IXth standard students of secondary school in Lakshadweep. The sample for the study was 222 IXth standard students of secondary school in Lakshadweep. The instruments adopted for data collection were, Ravens Standard progressive Matrices and Levenson's Locus of Control Scale. The t-test for was used for differential analysis to find out the significance of difference. Pearson product moment correlation coefficient was employed to determine the relationship between the variables. The findings of the study revealed that the underachievers scored more in external

locus of control than internal locus of control. The findings further revealed a significance difference between underachieving boys and girls with regards to their locus of control. In the opinion of Eduwem et al. [3] conducted a study "on psychological factors and secondary school's student's academic performance in mathematics. The study adopted the causal-comparative research design. One hypothesis was tested for the study. The sample of the study comprised of 300 Senior Secondary Two (S.S.2) students from six secondary schools in Calabar Metropolis of Cross River State, Nigeria. The instruments used for data collection were Students' psychological variables rating scale; and Mathematics achievement test. Data collected was analysis using multiple regression analysis. The findings from the study showed that students' psychological factors and students' achievement at knowledge and understanding levels are significant joint predictors of senior secondary students' performance in Mathematics at the thinking level, and that such prediction could be done using the equation: Students' performance in Mathematics thinking, interest, attitude, motivation, self-concept, test anxiety, locus of control, Knowledge and Understanding. The findings further revealed that students' performance at the understanding level is the strongest predictor of their performance at the thinking level followed by performance at the knowledge level. It is concluded that certain factors are responsible for students' performance in mathematics".

Nevertheless, the present situation in Anambra state among other states in Nigeria shows an increase in poor performance at a very significant rate and has constituted serious worry for stakeholders in the education sector such as the parents, teachers, school administrators, and the government but it is not yet empirically established whether a factor like self-esteem and locus of control can influence the rate of academic achievement of students in Mathematics. For instance, the West African Examination Council Chief examiners reports on the results of students show that there have been a steady decline and students achieve poorly academically in the years 2016, 2017, 2018 and 2019. The percentage pass with credit and above recorded were 23.0%, 31.0%, 24.94% and 38.98% respectively (West African Examination Council Examination, WAEC, 2019). More so, it is however disheartening that despite the importance of Mathematics subject to the world of work, and the efforts made by the federal

government, secondary school students still record steady fluctuations in their academic achievement in Mathematics. This has continued unabated, and the level of academic achievement recorded could be hinged on certain attributes or characteristics such as self-esteem and locus of control. Based on the fluctuations in secondary school students' academic achievement and its looming consequences, the present study determined the correlation between self-esteem, locus of control and academic achievement of secondary school students in Mathematics.

1.1 Research Questions

1. What is the relationship between self-esteem and academic achievement of male secondary school students in Mathematics in Anambra state?
2. What is the relationship between locus of control and academic achievement of male secondary school students in Mathematics in Anambra state?
3. What is the interaction among self-esteem, locus of control and academic achievement of secondary school students in Mathematics in Anambra state?

1.2 Hypotheses

1. There is no significant relationship between self-esteem and academic achievement of male secondary school students in Mathematics in Anambra state.
2. There is no significant relationship between locus of control and academic achievement of male secondary school students in Mathematics in Anambra state.
3. There is no significant interaction among self-esteem, locus of control and academic achievement of secondary school students in Mathematics in Anambra state.

2. METHODOLOGY

This study adopts the correlation survey research design. According to Nworgu [21], a correlational research design seeks to establish relationship between two or more variables as well as indicates the direction and magnitude of the relationship between the variables. The study was conducted among 18,297 senior secondary school students from the six education zones in Anambra state. The multistage sampling procedure was adopted to select a sample of 895 SS II students from Awka education zone. The instruments for data collection were the self-

esteem scale developed by Hare in 1975, the locus of control scale developed by Aston Trice in 1985. These instruments were examined and its usability and validity in Nigeria reported. The student's terminal results in mathematics were gathered in order to measure student's academic achievement scores in mathematics. The reliability of the instrument was as follows The Hare self-esteem scale was subjected to a test-retest reliability and indicated a good stability $r = .56$ to $.65$ for the three sub-scales and $r = .74$ for the general scale. The reliability coefficient is 0.73 as reported by Adeagbo [22], and 0.79 as reported by Abekoye and Fusigboye [23] for the Trice's academic locus of control scale. The administration of the instrument was done through direct delivery approach. By this method, copies of the questionnaire were distributed personally to the respondents (SS II students) by the researcher with the help of the regular teachers from each school sampled, the teachers will be trained and enlightened on the research assistant's role. Data relating to research question 1 and 2 was analyzed using Pearson product moment correlation coefficient, while research question 3 was analyzed using simple regression analysis. The research hypotheses raised were analyzed using multiple regression analysis. Multiple regression analysis determined the R, R – squared and R² adjusted. The significant value on the coefficient table was used to test hypotheses 1 – 4, while the R, R – square and R² adjusted coefficients were used to establish the percentage correlation among self-esteem, locus of control and academic achievement.

3. RESULTS AND DISCUSSION

Research Question 1: What is the relationship between self-esteem and academic achievement of male secondary school students in Mathematics in Anambra state?

Hypothesis 1: There is no significant relationship between self-esteem and academic achievement of male secondary school students in Mathematics in Anambra state.

The results presented shows that a moderate positive relationship of 0.544 exists between male secondary school students' self-esteem and their academic achievement in Mathematics. Result relating to the null hypotheses reveal that at 0.05 level of significance and 308df, the calculated t 10.58 with P value 0.000 which is less than 0.05, hence the null hypothesis is

rejected. This implies that there is a significant relationship between self-esteem and academic achievement of male secondary school students in Mathematics in Anambra State.

These findings contradict Ibeawuchi and Iruloh [17] who reported that a very low relationship between self-esteem, internal locus of control, external locus of control and academic underachievement which showed no statistical significance. This variation could be due to the gender factor introduced in the present study. These findings conform with Okafor et al. [18], who found that students' self-esteem has positive significant relationship with their academic achievement in both English Language and Mathematics. They further reported that there exists a significant positive relationship between secondary school students' self-esteem and their academic achievement in Imo state [18]. The findings of the present study further affirm with Alokun et al. [19] who reported that there is a significant difference in the academic performance of students with high self-esteem and students with low self-esteem.

Research Question 2: What is the relationship between locus of control and academic achievement of male secondary school students in Mathematics in Anambra state?

Hypothesis 2: There is no significant relationship between locus of control and academic achievement of male secondary school students in Mathematics in Anambra state.

A low positive relationship of 0.336 exists between male secondary school students' locus of control and their academic achievement in Mathematics. In the same vein, at 0.05 level of significance and 308df, the calculated t 5.03 with Pvalue 0.010 which is less than 0.05, the null hypothesis is rejected. There is a significant relationship between locus of control and academic achievement of male secondary school students in Mathematics in Anambra State.

These findings agree with Thangal et al. [20] who found a significance difference between

underachieving boys and girls with regards to their locus of control. Furthermore the findings of the present study is in agreement with Eduwem et al. [3], as it reports that students' psychological factors and students' achievement at knowledge and understanding levels are significant joint predictors of senior secondary school students' performance in Mathematics at the thinking level, and that such prediction could be done using the equation: The findings further revealed that students' performance at the understanding level is the strongest predictor of their performance at the thinking level followed by performance at the knowledge level. It is concluded that certain factors are responsible for students' performance in Mathematics.

Research Question 3: What is the interaction among self-esteem, locus of control and academic achievement of secondary school students in Mathematics in Anambra state?

Hypotheses 3: There is no significant interaction among self-esteem, locus of control and academic achievement of secondary school students in Mathematics in Anambra state.

The results revealed a moderate positive relationship of 0.562 exist among secondary school students' self-esteem, locus of control jointly with their academic achievement in Mathematics. In the same vein, at 0.05 level of significance 3df numerator and 890df denominator, the calculated $F_{314.12}$ with Pvalue 0.000 which is less than 0.05, this implies that the null hypothesis is rejected. Thus, there is a significant joint relationship among secondary school students' self-esteem, locus of control and gender with their academic achievement in Mathematics.

The findings of the present study further affirm with Alokun et al. [19] who reported that there is a significant difference in the academic performance of students with high self-esteem and students with low self-esteem. These findings agree with Thangal et al. [20] who found a significance difference between underachieving boys and girls with regards to their locus of control.

Table 1. Pearson r on self-esteem and academic achievement of male secondary school students in Mathematics in Anambra state (N=310)

Sources of variation	N	Self-esteem r	Mathematics r	Remark
Self-esteem	310	1.00	0.544	Moderate positive relationship
Mathematics	310	0.544	1.00	

Table 2. t-test on the relationship between self-esteem and academic achievement of male secondary school students in Mathematics (N=310)

N	Cal. r	Df	Cal. T	Pvalue	Remark
310	0.544	308	10.58	0.000	Significant

Table 3. Pearson r on locus of control and academic achievement of male secondary school students in Mathematics in Anambra state (N=310)

Sources of variations	N	Locus of control r	Mathematics r	Remark
Locus of control	310	1.00	0.336	Low positive relationship
Mathematics	310	0.336	1.00	

Table 4. t-test on the relationship between locus of control and academic achievement of male secondary school students in Mathematics (N=310)

N	Cal. r	Df	Cal. T	Pvalue	Decision
310	0.336	308	5.03	0.010	Significant

Table 5. Summary of regression analysis on secondary school students' self-esteem, locus of control and their academic achievement in Mathematics in Anambra State (N=892)

R	R Square	R ² Adjusted	Remark
0.562	0.315	0.314	Moderate positive relationship

Table 6. Summary of regression analysis on the relationship existing among secondary school students' self-esteem, locus of control, gender jointly with their academic achievement of secondary school students in Mathematics (N=892)

N	R	R Square	R ² adjusted	Df	Cal. F	Pvalue	Remark
892	0.562	0.315	0.314	890	314.122	0.000	Significant

4. CONCLUSION

Based on the analysis, it was concluded that, the absence of self-esteem and locus of control among students can lead to early discouragement, and in turn propel poor academic achievement in core subjects despite the relevance of these subjects to academic growth and development. This can result in lack of interest and perseverance at school tasks, and ultimately, they may find it easier to avoid potential damage that might occur due to attributing failures to their own fault or ability. Therefore, they start to make external attributions rather than to accept blame.

CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard guideline participant consent and

ethical approval has been collected and preserved by the authors.

ACKNOWLEDGEMENT

The authors wishes to acknowledge the academic and non-academic staffs of the Department of Guidance and Counselling for their contribution and assistance. Similarly, the Authors wishes to acknowledge all the Authors whos' work was referenced in this work.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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