

RELATIONSHIP AMONG SECONDARY SCHOOL STUDENTS' ACADEMIC SELF-CONCEPT, SELF-ESTEEM AND ACADEMIC ACHIEVEMENTS IN MATHEMATICS IN ANAMBRA STATE

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ABSTRACT

Students' academic self-concept and self-esteem are strong indicators and facilitators for effective learning. Their relationship in determining academic achievement has been a debating issue in the educational field. The study examined the relationship among students' academic self-concept, self-esteem, and academic achievement in mathematics in Anambra State. Four research questions and four null hypotheses guided the study. The study adopted correlational approach to provide answers to the research questions and test the hypotheses. The population of the study comprised 17,982 SS2 students of public secondary schools in Anambra state from which a sample of 600 was drawn. Multi-stage procedure was used to select the sample. Two standardized research instruments namely; Self Description Questionnaire (SDQ), Self-Esteem Questionnaire (SEQ), as well as scores from students' promotional examination were used for data collection. Cronbach's alpha was used to determine the reliability of the items in the instruments. Reliability indices of 0.83, 0.74 and 0.72 were indicated for high self-esteem, low self-esteem and self-concept respectively. The Pearson product moment correlation was used to answer research questions 1 to 3 and test of hypotheses 1 to 3 while the research question four and hypothesis four were answered and tested with multiple regression. The findings showed that students' academic self-concept recorded a very low positive relationship with academic achievement in mathematics. Students' high self-esteem recorded a medium positive relationship with students' academic self-concept. Findings of the study revealed that these variables do not statistically predict academic achievement of the students. Based on the findings, it was recommended that, it is necessary to give adequate and sufficient attention to academic self-concept and self-esteem as these variables recorded a very low positive relationship with achievement and teachers should be offered methodological guidance in order to work on these variables for optimal performance in future.

Keywords: *Academic self-concept, Self-esteem and Academic achievement.*

Introduction

For students to learn and perform excellently, they must be sufficiently and psychologically healthy. A psychologically healthy individual

is the person that has a positive perception of his/her total self. This positive personality construct can be developed through educational processes in the educational institutions. The overriding theoretical orientation of human perception is grounded in the perceptual psychology tradition. Perceptual psychologists postulated that all persons create their own reality through their perceptions of what they believe to be real (Obilor, 2011). And that a person's behaviour is contingent on how an individual perceives and interprets his/her experiences. Thus from the perspective of the perceptual psychology, it is clear that to understand an individual's behaviour, we need to know how that individual perceives and interprets his/her experiences. In other words, to appreciate students' academic performance, we need to understand how students perceive and interpret school and school subjects by investigating their belief system such as self-esteem and self-concept. The critical roles of education will help to facilitate the development of the students' self-esteem and their academic self-concept for their interplay could predict academic achievement.

High efficacy and quality of educational system is among the most influential factors of national development. Preparing of individuals to acquire knowledge and skill and training of man power is the main task of educational system (Bahrami & Bahrami, 2015). Thus students' academic achievement is a fundamental priority and concern of all countries. Academic success of students enriches the human resources of the society and guarantees the future development of a country. In contrast, educational failures make the communities impossible to use their potential of human capital and endanger the sustainable development in addition to great

monetary losses (Bahrami & Bahrami, 2015). Therefore, the examination of factors associated with academic achievement has been a highly interesting area of research in recent Nigerian educational system. Among the different factors affecting academic achievement, intelligence has long been regarded as the main factor but today it is believed that it cannot be considered as a successful determinant of students' achievement. Many studies have examined the relationship of different variables as a solution to underachievement such as; time management, study environment, peer education, effort organizing, help seeking and other personality traits, motivational strategies and goal orientation. Despite improvement on these variables the problem of poor performance remains unsolved. To this end, the present study aimed to find the relationship between students' self-esteem and academic self-concept in determining their academic achievement. Thus, academic self-concept and academic self-esteem are two personality constructs and their association may impact positively on students' academic achievement.

Self-esteem is the evaluation aspect of the self-concept that corresponds to an overall view of the self as worthy or unworthy (Rahmani, 2011). It expresses an attitude of approval and indicates the extent to which an individual believes himself to be capable, significant, successful and worthy. Significantly, the controversial issue that surrounds the use self-esteem and self-concept interchangeably in teaching and learning is one of reasons to examine these two personality constructs in the course of this research. Distinguishing self-esteem from self-concept indicates that self-esteem represents the emotional response that people experience

as they contemplate and evaluate different things about themselves (Azizi, 2015). Although, self-esteem is related to self-concept, it is possible for people to believe objectively positive things such as acknowledging skills in academics, athletics or arts, but continue to not really like themselves (Guay, Marsh & Boivin, 2003). Conversely, it is possible for people to like themselves and therefore hold high self-esteem, in spite of their lacking any objective indicators that support such positive self-views. Although, influenced by the contents of the self-concept, self-esteem is not the same with self-concept.

Self-esteem is produced over the life and can be either positive (high self-esteem) which resulted to positive outcomes or negative (low self-esteem) which resulted to negative outcomes. High Self-esteem means that a person has a conviction to do what is right in life (Saadat, Ghasezadeh, & Soleimani, 2012). Low self-esteem defined a belief that represents individual's negative emotion towards the self which embraces negative appraisal by lowering his/her self-view (Ghazvini, 2011). The effects of self-esteem in students' lives are so crucial that those with high self-esteem are more likely to persist in the face of difficulties and are better equipped to cope with challenges that arise in their personal lives unlike those with low self-esteem (Anyamene, Nwokolo & Ezeani, 2016). However, the nature of self-esteem one has developed may relate positively with one's self-concept. This is because self-esteem has long been considered an essential component of good mental health and has drawn many researchers' attention in recent years (Marayam, Azizreza & Mahsa, 2011). Self-esteem is composed of person's self-assessment and a combination of his/her self-

concept of characteristics and abilities (Flouri, 2006). Our self-esteem develop and evolve throughout our lives as we build an image of ourselves through our experiences with different people and activities. Experiences during our childhood play a particular large role in the shaping of our self-concept and self-esteem.

It is interesting to know that persons who feel insufficient and worthless, assume themselves to be unimportant and unable to produce internal sources for improving their situation. These people believe that they are unsuccessful and unhelpful and relate these to their inability to achieve their goals despite a lot of efforts to improve the situation. These beliefs are as a result of poor self-esteem (Daglas, 2006). Also, the type of self-esteem one has endorsed can predict one's academic self-concept in determining one's academic achievement.

Academic self-concept refers to the totality of the cognitive beliefs that people have developed about themselves, which may represent everything that is known about their academic self (Shavelson, Hubner & Stanton, 2006). Also, academic self-concept describes the mental representation of one's academic ability (Brunner, Niepel & Preckel, 2014). It represents the internal beliefs system which one has for one's academic ability. Brunner et al (2014), characterized academic self-concept as a personal self-perception which is formed through one's academic ability which is formed through one's experience in learning and achievement contexts. Academic self-concept is typically conceived to be hierarchically organized and to be highly specific to particular subject, with a general academic self-concept at the apex (Brunner, Keller, Dierendonck, Reichert, Ugen, &

Fischbach, 2010). In another observation, Emesi (2017), described academic self-concept as an internal personality construct that represents the beliefs and dispositions for one's academic ability. Self-concept theory is a relatively new area in Nigeria education scene thus, more researches on this field should be conducted to delve into the self-concept patterns and how they affect academic achievement, vocational choices and problem-solving abilities (Obilor, 2012). Since academic self-concept and self-esteem can play significant role in producing internal self-belief and capability to think towards research and scientific production, it is essential to examine these personality constructs in relation with academic achievement.

Suffice it to say that in some part of Nigeria, researches have been carried out which confirm the significant relationship between academic self-concept and academic achievement (Obilor, 2012 & Obilor, 2011), but more studies need to be done to replicate the above findings in Anambra State in the bid to address the poor academic achievement in mathematics. On this note, the researchers aimed to examine students' academic self-concept and self-esteem as correlate of academic achievement in mathematics in Anambra State.

The Nigerian government has shown tremendous concern towards the poor academic performance in mathematics. As a country that needs mathematics education for her development, she deserves the total attention of educational planners, teachers and researchers for a massive improvement of the poor performance of students in mathematics. Many reasons have been given for this abysmal performance of students in mathematics such as, students' negative

attitude towards mathematics, poor teaching method by the teachers and poor time management towards mathematics. Despite improvement on these identified variables, the problem still persists. One begins to think of some other variables that could predict students' academic achievement in mathematics. Such psychological variables are self-esteem and academic self-concept. The problem is, could the self-esteem and academic self-concept jointly predict mathematics achievement of secondary school students? Also, can one's academic self-concept influence one's self-esteem to determine one's academic achievement? Against this backdrop, the researchers examined the relationship that exists among students' academic self-concept, self-esteem and academic achievement in mathematics in Anambra state.

Research Questions

1. What is the relationship between students' academic self-concept and their academic achievement in mathematics?
2. What is the relationship between students' self-esteem and their academic achievement in mathematics?
3. What is relationship between students' academic self-concept and their self-esteem?
4. What is the proportion of variance in academic achievement in mathematics that is explained by students' academic self-concept and their self-esteem?

Hypotheses

1. There is no significant relationship between students' academic self-concept and their academic achievement in mathematics.
2. There is no significant relationship between students' self-esteem and their academic achievement in mathematics.
3. There is no significant relationship between students' academic self-concept and their self-esteem.
4. The proportion of variance in academic achievement in mathematics that is explained by students' academic self-concept and their self-esteem is not significant.

Research Method

The researchers used a correlational research design and used questionnaires to collect data for the study. The population of this study consisted of 17,982 being the total number of students in senior secondary school class II in Anambra State. A sample size of 690 was drawn from the senior secondary schools in the six education zones of Anambra State. Out of the 690 questionnaires administered to respondents, 600 of them were found useful during data analysis. Multi-stage sampling procedure was used to select the respondents. The procedures for the selection were as follows: In stage one, three education zones were selected from the six education zones in the state by simple random sampling. Then in stage two, from each sampled education zone, one local government area (L.G.A) was selected through simple random sampling giving a total of three (3) L.G.AS. In stage three, from each sampled L.G.A, 10 schools were randomly selected giving a total of 30 schools. Then, from each of the schools, 23

SSII students were selected for the study using a table of simple random sampling. This gave a total number of 690 students used in the study.

The study adapted two standardized research questionnaires namely; Marsh (1990) Self Description Questionnaire (SDQ) and Eysenck and Eysenck Self-esteem Questionnaire (1976). The students' achievement scores were obtained from the schools before the start of the administration of the other two instruments. The students' achievement scores in mathematics from the state wide senior secondary One (SS1) promotion examination were obtained from the schools before the administration of the instruments.

The methods used in validating the instruments were face and content validity by the three experts from the Faculty of Education, Nnamdi Azikiwe University Awka. Cronbach's alpha reliability method was used to determine the internal consistency of the items in different clusters such as; 0.83, 0.74 and 0.72 for high self-esteem, low self-esteem and self-concept respectively. The Pearson product moment correlation was used in answering research questions one to three and testing hypotheses one to three. Multiple regressions were used to answer research question four and to test hypothesis four at 0.05 level of significance. The decision rule for the null hypotheses with P-value higher than 0.05 was not rejected while the hypothesis with P-value lower than 0.05 was rejected. The guide for interpretation of correlational results was done in accordance with Okoye (2015), rough guide for interpreting correlation coefficient values when a large number of pairs of scores have been correlated. The decision rules to interpret

the research questions were presented as follows: $r = .00$, no relationship; $r = \pm 0.0$ to ± 0.2 very low relationship; $r = \pm 0.2$ to ± 0.4 ,

low relationship; $r = \pm 0.4$ to ± 0.6 , medium relationship; $r = \pm 0.6$ to ± 0.8 high relationship and $r = \pm 0.8$ to 1.0 , very high relationship.

Presentation of Results

Research Question 1: What is the relationship between students' academic self-concept and their academic achievement in mathematics?

Table 1: *Relationship between Students' Academic Self-concept and their Academic Achievement in Mathematics*
(N=600)

Variable	mathematic (r)	Remark
Self-concept	.241	A very low positive relationship

The result in table 1 revealed a very low positive relationship between students' academic self-concept and their academic achievement in mathematics.

Research Question 2: What is the relationship between students' self-esteem and their academic achievement in mathematics?

Table 2: Relationship between Students' Self-esteem and their Academic Achievement in Mathematics
(N=600)

Variable	mathematic (r)	Remark
High self-esteem	.241	A very low positive relationship
Low self-esteem	.251	A very low positive relationship

The result in table 2 revealed a very low positive relationship between students' self-esteem and their academic achievement in mathematics.

Research Question 3: What is the relationship between students' academic self-concept and their self-esteem?

Table 3: Relationship between Students' Academic Self-concept and their Self-esteem

(N=600)

Variable	Academic self-concept (r)	Remark
High self-esteem	.639	A medium positive relationship
Low self-esteem	.240	A very low positive relationship

The result in table 3 revealed a medium positive relationship between students' high self-esteem and their academic self-concept while the students' low self-esteem recorded a very low positive relationship with their academic self-concept.

Research Question 4: What is the proportion of variance in academic achievement in mathematics that is explained by students' academic self-concept and self-esteem

Table 4: Proportion of variance in academic achievement in mathematics that is explained by students' Academic self-concept and Self-esteem (N = 600)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.321 ^a	.103	.098	5.98407

Table 4 revealed that the proportion of variance in academic achievement in mathematics that is explained by students' academic self-concept and self-esteem is 0.10.3%.

Hypothesis1: There is no significant relationship between students' academic self-concept and their academic achievement in mathematics.

Table 5. *The test for Significant Relationship between Students' Academic self-concept and their Academic Achievement in Mathematics.*

Variable	mathematics achievement(r)	p-value	remark
Academic self-concept	.241	.000	S

S-Significant correlation at 0.05 level of significance

The result in table 5 revealed that the relationship between students' academic self-concept and academic achievement in mathematics is significant ($r = .241 > 0.05$). The null hypothesis was accepted.

Hypothesis 2: There is no significant relationship between students' self-esteem and their academic achievement in mathematics.

Table 6. *The test for Significant Relationship between Students' Self-esteem and their Academic Achievement in Mathematics.*

Variable	mathematics achievement(r)	p-value	remark
High self-esteem	.241	.000	S
Low self-esteem	.251	.000	S

S-Significant correlation at 0.05 level of significance

The result in table 6 revealed that the relationship between students' self-esteem and academic achievement in mathematics is significant ($r = .241 > 0.05$) and ($r = .251 > 0.05$). The null hypothesis was accepted.

Hypothesis 3. There is no significant relationship between students' self-esteem and their academic self-concept.

Table 7. *The test for Significant Relationship between Students' Self-esteem and their Academic self-concept.*

Variable	academic self-concept(r)	p-value	remark
High self-esteem	.639	.000	S
Low self-esteem	.240	.000	S

S-Significant correlation at 0.05 level of significance

The result in table 7 revealed that the relationship between students' high self-esteem and academic self-concept is not significant ($r = .639 > 0.05$) while the relationship between students' low self-esteem and academic self-concept is significant ($r = .240 > .05$). The null hypothesis was accepted.

Table 8: Multiple Regression of the Students' Academic self-concept and Self-esteem on Students' Academic Achievement in Mathematics. (N = 605)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.321 ^a	.103	.098	5.98407

Model	Change Statistic R Square Change	F Change	df1	df2	Sig. F Change
1	.103	22.789	3	596	.000

Model		Sum of Squares	Df	Mean Square	F	Sign.
1	Regression	2448.179	3	816.060	22.789	.000 ^b
	Residual	21342.219	596	35.809		
	Total	23790.398	599			

Table shows a multiple regression run to predict students' academic achievement in mathematics from academic self-concept and self-esteem. These variables do not statistically predict academic achievement of the students, $F(3,596) = 22.789$, with R^2 of 10.3%. Students' academic self-concept and self-esteem does not significantly predict academic achievement in mathematics, $P < .05$. Thus, there is a low positive relationship between students' technological experience, academic engagement and their academic achievement in mathematics.

Discussion of Findings

Findings in table 1 revealed a very low positive relationship between students' self-concept and academic achievement in mathematics. The study of Obilor (2011), that examined the relationship between self-concept and mathematics achievement of senior secondary school students in Port Harcourt metropolis is in support with the present study. The result from Obilor's findings revealed that mathematics self-concept is positively related to mathematics achievement, general academic achievement and general academic self-concept. In the study of Niepel, Brunner and Preckel (2014), that examined achievement goals, academic self-concept and school grades in

mathematics. Findings from their results supported the present study as their study recorded that academic self-concept and achievement showed positive reciprocal relations. Also, the study of Guay, Marsh and Boivin (2003), that examined academic self-concept and academic achievement, is in support with the present study. Their result indicated that as children grow older, their academic self-concept responses become more reliable, more stable and more strongly correlated with academic achievement. Again, the study of Emesi (2017), that examined relationship among secondary school students' achievement goal orientation, academic self-concept and academic achievement in mathematics, supported the present study. In Emesi's findings, it was recorded that

academic self-concept recorded a very low positive relationship with students' achievement in mathematics. Also, the study of Ghazvini (2011), that examined relationship between academic self-concept and academic performance in high school students in Iran, supported the result of the present study. In Ghazvini's result, it was indicated that a close relationship was recorded between academic self-concept and measures of academic performance. Academic self-concept powerfully and positively predicts general performance in literature and mathematics.

Findings in table 2 revealed that a very low positive relationship between students' self-esteem and their academic achievement in mathematics. The study of Saadat, Ghasemzadeh and Solumani (2012), that examined self-esteem in relationship with academic achievement supported the findings of the present study. In their result, it was recorded that academic self-esteem and family self-esteem on the meaningful level had a direct and positive relationship with academic achievement of the students. Also, the study of Rahmani (2011) that examined the relationship between self-esteem, achievement goals and academic achievement, supported the present study. In Rahmani's study, it was recorded that a strong positive relationship existed between self-esteem and academic achievement. Also, the study of Bahrami and Bahrami (2015), that examined the relationship of self-esteem and achievement goals with academic performance does not support the findings from the present study. This is because their results revealed that none of the self-esteem has statistical correlation with students' mathematics achievement.

Findings in table 3 revealed a medium positive relationship between students' high self-esteem and their self-concept, but students' low self-esteem recorded a very low positive relationship with academic self-concept. Findings in table 4 revealed that the proportion of variance in academic achievement that is explained by students' academic self-concept and self-esteem is 10.3% and this is statistically insignificant. The study of Obilor (2012) that examined the influence of academic self-concept on English language and Mathematics achievement does not support the present study. In Obilor's multiple regression study, all the predictors account for 60.5% of the variance in mathematics score and this is statistically significant.

Findings in table 5 revealed that the relationship between students' academic self-concept and their achievement is significant. The study of Obilor (2011), supported the result from the present study as his result recorded a significant positive relationship between students' mathematics self-concept and their mathematics achievement. The study of Emesi (2017), supported the result from the present study as his result recorded a significant relationship between students' academic self-concept and their academic achievement.

Findings in table 6 revealed that the relationship between students' self-esteem and academic achievement is significant. The study of Bahrami and Bahrami (2015), supported the present study as their result recorded a significant relationship between self-esteem and academic achievement. The study of Rahmani (2011) supported the result from the present study as it recorded a

significant relationship between self-esteem and academic achievement.

Findings in table 7 revealed that the relationship between students' high self-esteem and academic self-concept is not significant, while the relationship between students' low self-esteem and their academic self-concept is significant. Findings in table 8 shows that a multiple regression run to predict students' academic achievement in mathematics from academic self-concept and self-esteem, revealed that these variables does not statistically predicted academic achievement of the students.

Conclusion

The results revealed that a very low positive relationship existed students' self-esteem and their academic self-concept. The proportion of variance in academic achievement in mathematics that was explained by students' academic self-concept and self-esteem is low in percentage rating. Finally, a multiple regression run to predict students' academic achievement in mathematics from academic self-concept and self-esteem statistically predicted academic achievement of the students in mathematics.

Recommendations

Based on the findings, the following recommendations were made:

- i. It is necessary to give adequate and sufficient attention to academic self-concept and self-esteem as these variables recorded a very low positive relationship with achievement and teachers should be offered methodological guidance in order to work on these variables for optimal performance in future.
- ii. Considering the significant contributions of self-esteem and academic self-concept to the academic achievement of the students, the augmentation of these personality constructs should be an imperative concern to educators, teachers, parents and counselors. Therefore, self-esteem and self-concept development should be a central focus of educational policies in Nigeria.
- iii. Counseling services should be provided in schools so that students battling with the problem of self-belief and underachievement in academic contexts can be mentored through the combined efforts of the school and significant others.
- iv. As a result of very low positive results from the study, decreases in self-esteem and academic self-concept should be taken seriously, considering potentially undesirable effects on a variety of academic outcomes, such as academic interest, academic choices or occupational aspirations.
- v. Thus, this finding may not be generalizable over different levels of academic self-concept and self-esteem thus pointing out that more research

- on the dynamics of self-beliefs adoption is needed that also takes into account the potential interactions with subgroups of students differing in their levels of academic self-beliefs.
- vi. The findings from the present study are highly relevant in this context because they yield further evidence on sensitive academic self-concept is to the adoption of self-esteem as they interact to predict academic achievement.
 - vii. All teachers and parents should therefore, adopt a more meaningful strategies to take seriously the responsibility of nurturing the self-esteem and academic self-concept of their students, for it is clear that these self-beliefs can have beneficial and destructive influence on students' achievement both in school and in future.
 - viii. Teachers, parents, counselors and significant others can aid their children by helping them to develop the habit of excellence in scholarship, while at the same time nurturing their self-beliefs necessary to maintain that excellence throughout their entire lives.
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