SELF-CONCEPT AS A CORRELATE OF SECONDARY SCHOOL STUDENTS ACADEMIC PERFORMANCE IN MATHEMATICS

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ABSTRACT

This study investigated self-concept as a correlate of the academic performance of Secondary School Students in Mathematics in Edo North Senatorial districts of Edo State. The purpose of the study was to determine the extent that self-concept explained students' academic performance in mathematics. The population consisted of 3,000 SS1 students of which the multi stage random sampling procedure was used to locate a sample size of 600 students. Data collected with the aid of a 20 item self-concept questionnaire (SCQ) was analysed using multiple Regression. The results show that self-concept had positive correlation with students' academic performance in mathematics. Based on the findings some recommendations were made.

Keywords: Academic performance, Mathematics, Self-concept.

1. INTRODUCTION

A good performance in mathematics is generally regarded as a prerequisite for entry into highly skilled professions in Science, Technology and Industry. While considering the general poor state of affairs in mathematics education, Azuka (2003) clearly alluded to the enormity of the problem when she stated that poor performance was the most prevalent index. A majority of secondary school students' fail to obtain the credit pass in mathematics which is mandatory for studying most courses in tertiary institutions.

The problem of poor performance in mathematics is not limited to Nigerian students. Raimi (2004) reported that the state of mathematics education and performance had never been good in the United States although a reform of some sort was always in place. The view of scholars like Adeep and Bosnick (2004) further confirms the problem of poor performance in mathematics in the United States. According to them, mathematics has been traditionally viewed as a discipline when success is limited to a minority as opposed to a majority of children.

Globally, mathematics has gained an indisputable importance and attention because it is a recurrent denominator in all scientific research studies. In addition, it occupies a unique position in scientific attempt at globalization through information and communication management (Agwagah, 2005). Salmon (2005) further adds to the list of the attributes of mathematics by referring to its' instrumentality in the effective use of electronic resources.

In spite of the importance of the subject, the statistics of the school certificate examinations depict poor performance. For instance, the senior secondary school certificate examination results from 2004 − 2007 (May / June) showed evidence of continued poor performance. In the year 2004 out of 10195924 candidates that sat for the examination only 33.97% had credit pass, while 66.03% failed. In the year 2005, 1054843 candidates sat for the examination, 38.20% had credit pass while 61.8% failed. Though there was a little improvement over 2004 performance but it was still very poor. In the year 2006, 1149277 candidates enrolled for the examinations, and 41.12% had credit pass. In year 2007, 1249028 candidates enrolled for the examination, 46.75% passed at credit levels while 53.25% failed. Recently in 2011, out of 1,540,250 candidates that sat for the examination only 472,906 candidates representing 30.99% had credit pass in mathematics. While in 2010 337,071 candidates representing 24.94% had credit pass in mathematics. (WAEC examiners report). Certainly, there is an urgent need to proffer solutions to the problem of poor performance of secondary school students in mathematics. In view of Azuka (2003) observation shows that over 50% of students are either uninterested or are low achievers. She believes that the poor performance problem requires a radical and urgent attention.

Some others like Denga (1987) have identified negative self-concept as factor amongst others that are responsible for student's poor academic performance. Equally researchers like Ryan (2002) reported self-concept as a correlate of academic performance. He observed that one of the difficulties people experience in education is closely related to the way they see themselves. This implies that many students who have difficulty in school or perform poorly academically, are not hampered as a result of lack of understanding or poor economic status of parents but because they have learned to see themselves as incapable of handling academic work. Looking at the above statics and research results, though the reasons for this epidemic of poor academic performance are arguably numerous, they can be traced to poor self-concept of students. A good number of studies have used 'self-concept' to determine its effect on academic performance. The studies include those of Marsh (1990); Francisco et al. (2004); Marsh (1990). They were divided into different experimental and control groups. The results show that self-concept can be enhanced in educational settings which in turn affects academic performance.

2. STATEMENT OF THE PROBLEM

One is beginning to witness a situation whereby some secondary school graduates find difficulties performing elementary computations in mathematics. For instance, the senior secondary school certificate examination results from 2004 − 2007 (May / June) showed evidence of continued poor performance. In the year 2004 out of 1019524students that sat for the examinations only 33.97% had credit pass, while 66.03% failed. In the year 2005, 1054853 sat for

the examination, 38.20% had credit pass while 61.8% failed. Though there was little improvement over 2004's performance but it was still very poor. In the year 2007, 1249028 enrolled for the examination, 46.75% passed at credit levels while 53.25% failed (Waec Forum, 2009). These statistics call for urgent attention.

Against this background, there is the desire to find out whether self-concept has any bearing on the academic performance of students in mathematics. This study set out to investigate the extent to which self-concept accounted for the academic performance of secondary school students in mathematics.

3. RESEARCH QUESTIONS

One research question and one hypothesis were raised for this study.

1   What is the level of self-concept of secondary school students?

3.1. Hypothesis

1   There is no significant relationship between self-concept of secondary school students and their academic performance in mathematics.

4. PURPOSE OF THE STUDY

The purpose was basically designed to determine the level of self-concept as well as the relationship between self-concept and academic performance in mathematics of secondary school students.

5. METHODOLOGY AND SAMPLING PROCEDURE

The study employed a correlational survey design. Consequently, the design is considered appropriate because of its inherent ability in surveying the current status of students' level of self-concept as well as academic performance using specific assessment techniques with the possibility of establishing the index of relationship between the measured variables.

A multistage sampling frame was used in drawing a sample of 600 senior secondary school one (SS1) students. The subjects were stratified on the basis of gender, local government area and educational qualification of parents.

6. INSTRUMENT

Two specific methods of data collection were employed:

1   A primary data source including the use of constructed questionnaire.

2   Secondary data source including the use of mathematics results of the sampled respondents in (SS1) the next examination after the administration of the instrument.

The questionnaire titled self-concept questionnaire contains 20 items on a five point likert scale ranging from almost never to almost always.

The researcher established face and content validity using some experts in the field. The content and construct validity were determined by the researcher using the factor analytic method.

7. RESULTS

The data were presented in tables on the basis of the one research question and one hypothesis.

The first research question raised states that:

1   What is the level of self-concept of secondary school students.

Table-1. Correlation matrix of mean, standard deviation, self-concept, and secondary school students, academic performance in mathematics.

Variables	Mean [1] 1	Std [1] 2	Map 3	Self-Concept 4
Map	36.25	11.76	1.00	
Self-Concept	31.28	45.09	.015	1.00

Note: 600, P<.05 level of significance, MAP = mathematics performance, STD = Standard deviation.

Table 1:1 shows the mean, standard deviation and interrelationship between the independent variable and the dependent variable.

To answer the first research question, table 1:1 was used. As revealed in the table the mean score for self-concept was 31.38 which revealed a poor self-concept among secondary school student. Therefore the research question 1 which states what is the level of self-concept among secondary school students was answered in the negative. The conclusion can then be drawn that there is a poor self-concept among secondary school students.

Hypothesis 1 states that there is no significant relationship between self-concept and secondary school students' academic performance. To test this hypothesis Table 2 was used.

Table-1.2. Multiple Regression analysis of the relationship between self-concept, and students' academic performance in mathematics.

Model	R	R²	R²Adjistal	Std Error of Estimate	
	.022	.000	− .002	12.79	
ANOVA					
	SS	df	ms	F	Significance
Regression	300	1	300	.002	.966
Residual	100579.11	614	163.810		
Total	10057	615			
Variables in the Equation					
Unstandardized Coefficients			Standardized Coefficients		
	B	S.EB	Beta	1	Significance
Constant	47.307	2.430		19.467	.000
Self-Concept	0.2	.05	.02	.40	.69

Note: P > 05 level of significance, SS = sum of square, ms = mean square, df = degree of freedom, B = unstandardized Regression coefficients, S.EB = standardized error of unstandardized coefficient, Beta = standardized coefficient.

Table 1:2 shows the computed stepwise regression analysis revealing the extent of relationship between self-concept, and secondary school students' academic performance in mathematics. To test the only hypothesis raised, the above table was used. It was observed that self-concept had a significant relationship with students' academic performance in mathematics. Since the regression value was .02 while the calculated t = 40 which is less than t critical. Therefore the hypothesis which states that there was no significant relationship between self-concept and mathematics academic performance was rejected. The conclusion therefore can be

drawn that self-concept has significant relationship with secondary school students' academic performance in mathematics.

8. DISCUSSIONS

The discussion was done under 2 sub-headings that are succinctly explained as follows:

Levels of self-concept of secondary school students. The negative self-concept among secondary school students was observed in this study. It contradicted with Adedipe (1984) study which observed that students have positive academic self-concept in mathematics and English Language.

Relationship between self-concept and students' academic performance in mathematics. This study found that self-concept of students significantly correlated with their academic performance in mathematics. This finding is in agreement with the studies of Adeniran (1996); Eniola and Adeyemi (1999); Francisco *et al.* (2004), which observed that self-concept has positive impact on academic performance. On the contrary the study contradicted that by Instituto Nacional de Calidad y Evaluacion (INCE) (2001) which posited that non-academic self-concept does not correlate with the measures of school achievement which is academic performance. However, the basis for the disparity of findings with this present study is obvious. Whereas these studies looked at the relationship between self-concept and academic performance generally, this present study has extended the frontiers of knowledge by examining the relationship between self-concept and academic performance in mathematics. The essence was to establish a basis for predicting students' poor performance in mathematics so as to implement preventive counselling strategies on such students with poor self-concept. The present study has established that positive self-concept is essential to counteracting poor academic performance in mathematics.

9. CONCLUSION

This study investigated self-concept as correlates of secondary school students' performance in mathematics. The purpose was to determine the nature of association between variables in order to establish a basis for student's poor performance in mathematics. One research questions and one hypothesis were raised. The findings revealed that: There was a negative self-concept among secondary school students and a significant linear relationship between self-concept and secondary school students' academic performance in mathematics. Students self-concept influenced their performance in mathematics positively.

10. RECOMMENDATIONS

(i)   Counsellors can rely on measures of self-concept to predict their character and performance as far as this variable is concerned since it was positively correlated with academic performance in mathematics.

(ii)   Counsellors should pay more attention to the variable of self-concept when trying to assist students with mathematics challenges since self-concept correlated positively with academic performance in mathematics.

(iii)   More counsellors need to be recruited in schools by government. Since by their training, they are better equipped to handle the aspect of improving the self-concept of students which will in turn impact positively on their performance in mathematics.

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