Influence Of Self-Concept, Study Habit and Gender on Attitude and Achievement of Secondary School Students in Mathematics

By Professor Usman Kamoru, and Olosunde Gbolagade Ramon, Ph.D.

Abstract

This study examined the relationship between self-concept, attitude of the students towards mathematics, and math achievement. Also, this study investigated the influence of study habits on achievement; study habits on attitude of students to mathematics. The influence of gender and self-concept and study habit group on achievement and attitude towards mathematics were separately investigated. The method adopted was correlation design. Two hundred (200) Senior Secondary School 2 students (Male = 74 Female =126) were used in the study. They were selected from six secondary schools from Ibadan Metropolis. Random sampling was used to select the local government, while stratified sampling technique was used to select 200 students, (male and female) used in the six schools. Data were collected using 20 items Mathematics Self Concept Questionnaire (MSCQ r= 0,86) and 20 items Mathematics Study Habit Questionnaire (MSHQ, r = 0.70) and 30 items multiple-choice Mathematics Achievement Test (MAT, r= 0.76) respectively and analyzed using Pearson Product Moment Correlation (PPMC) and t-test statistics tested at 0.05 level of significance. The result showed that there was a positive relationship between students' attitude and mathematics (P_{200} = 0.976; P< 0.05), study habit and academic achievement (P_{200} = 0.563; P< 0.05) for both self-concept and study habit groups. Also, there was no significant difference in gender for both self-concept and study habit group. However, it was suggested that teachers should develop in their students a positive self-concept towards Mathematics including good study habits and pleasant teaching experience to enhance higher self-concept, good study habit and better performance in Mathematics.

Introduction

In the field of education and psychology, learning has been described as a highly complex process. Several researchers have tried to explain it differently and the description of each is partially true. Practices of teachers, counselors, psychologist and school administrators as well student dispositions of self-efficacy, self concept, study habits, state of health, motivation, anxiety, a conducive environment for studying, availability of textbooks, and well-equipped libraries were designated as perceived factors for poor academic performance among Nigerian students (Oke, 2005).

As recent as 2012, the West African Examination Council (WAEC) stated academic performance has been very low among secondary school students in Nigeria (WAEC, 2012). This trend in low academic performance has been attributed to certain factors including social, economic, regional and psychological factors in which self-concept plays a role (Largea, Sanni and Brew, 2014). Bandura's studies of self concept among students in the United States established self concept as a major factor contributing to students' academic performance (Bandura, 1997).

Other researchers established a link between high school students' level of engagement in school, self-efficacy and goal orientation (Caraway, Trucker, Renike & Hall, 2003). Also, students' fears of failure in a variety of academic situations contributed to low effort while social supports, such as parents and teachers, could provide positive reinforcement for students' success and increase overall involvement in student learning activities to reduce negative feelings towards school (Lashawn, Catrice & Baco, 2011).

Another concept that influences student learning is study habit which combines study method and study skill. According to Gbore (2006) study habit refers to predispositions which students have developed towards private readings through a period of time. According to him, study habit is a gateway to successful achievement in studies.

Odiri (2015), observed that the study habits of students vary from one student to the other and from one place to another. It is an important aspect of learning because student achievement in school depends greatly on their study habits. Adeyemo (2005) and Gbore (2006) investigated study habits. They argued that study habits have strong relationships with the academic performance of students and certain study habits influence student learning more than others.

Constantine and Blackmon (2002) examined the relationship between Black American adolescent student self-esteem and academic performance by demonstrating how students with low self esteem tend to denigrate academic performance. Often, students may place different levels of importance on academics based on perceived personal or societal limitations, thus leading to diminished academic outcomes. Constantine and Blackmon (2002) identified characteristics of a person's self concept based on specific situations and experiences. They described self-concept as: a) organized or structured self perceptions based upon experiences and meanings associated with those experiences, b) multifaceted feelings and events in different areas of an individuals' life such as personal, familiar and societal and c) stable or established viewpoint.

Several researchers reported the relationship between gender and self-concept and consequently academic achievement (Skaalvik & Rankin, 1994, Wingfield & Ecceles, 1994). They reported that boys seem to have a more positive self-concept in a number of dimensions than girls in Mathematics. Meanwhile, researchers working in the areas of gender issues have not resolved the debate on gender difference in Mathematics.

This research into student low performance in mathematics indicates that many students fail mathematics because they have low self-concept and poor study habits and poor attitudes towards the subject.

In Nigeria today, almost all courses of study in universities require mathematical skills. The increasing failure rate of students in these subjects challenges researchers to understand and explain student mathematics self-concept, and their study habits in secondary school within Oyo State, Nigeria.

The following research questions guided this study:

RQ1: What is the relationship between students' self-concept and study habit group on attitude and their achievement in mathematics?

RQ2: What is the relationship between students' study habit and achievement in mathematics?

RQ3: What is the relationship between self-concept and the students' achievement in mathematics?

RQ4: How do male and female students differ for attitude toward mathematics?

Methodology

This study adopted a correlational design. The population for the study comprised all the secondary school students in Ibadan metropolis, Oyo state. Out of the population, a total of two hundred (200) students were randomly drawn from six secondary schools class (SS2). Also these students were stratified along gender (74 male and 126 female).

A standardized self-concept instrument and study habit was validated by researcher using a Cronbach reliability method with (MSCQ, r=0.84) and (MSHQ, r=0.70) respectively. Also, Mathematics Achievement Test (MAT) was validated using KR_{20} with (r=0.76). MSCQ, MSHQ and MAT were administered on sampled students for the study. The exercise was carried out in each of the selected schools. The cooperation of the Mathematics teachers in each of the sampled schools facilitated the administration with the proper supervision of the researcher, research assistants and teachers. There were no reports of loss items and a 99% return rate was achieved.

Table 1: Relationship between self-concept and study habit group on student attitude and achievement in Mathematics.

Variable	N	Mean	SD	R	Sig
Students attitude	200	76.45	1.678		
Students performance	200	67.79	2.912	0.976	.000

Table 2: Relationship between student self-concept and study habit group on academic achievement.

Variable	N	Mean	SD	R	Sig
Students study habit	200	59.98	5.342		
Students achievement	200	67.79	4.657	0.794	.042

Table 3:	Relationship between self-concept and math academic achievement.					
Variable	**N**	**Mean**	**SD**		**R**	**Sig**
Students self-concept	200	45.59	4.546			
Students achievement	200	67.79	2.786		0.563	.049

Table 4:	Showing mean scores of the attitude of male and female students to mathematics.				
Variable	**N**	**Mean**	**SD**	**T**	**Sig**
Male	74	73.78	10.143	-0.295	
Female	126	72.72	10.989		NS

Data Analysis

The study adopted Pearson Product Moment Correlation (PPMC) and student gender comparisons for the analysis of data on the study.

RQ_1: What is the relationship between students' self-concept and study habit group on attitude and their achievement in Mathematics?

Table 1 displays the results of the relationships of the student attitude and their academic performance in Mathematics. The result (r_{200}= 0.976; p<0.05) indicates that there was a positive relationship between students' attitude and performance in mathematics which is significant at 0.05. The value of r which is 0.976 implies that their relationship between the two variables is strong.

RQ_2: What is the relationship between students' study habits and achievement in Mathematics?

Table 2 shows the results of the Pearson Product Moment (PPMC) between the students' study habits and academic achievement in Mathematics (r_{200}= 0.794; p<0.05) indicating that there is a positive relationship between students' study habit and performance in Mathematics which is significant at 0.05. The value of r which is 0.794 implies that the relationship between the two variables is strong.

RQ_3: What is the relationship between self-concept and the students' achievement in Mathematics?

Table 3 presents the results of the Pearson Product Moment (PPMC) between the students' self-concept and academic performance in Mathematics. The result (r_{200}= 0.563; p<0.05) indicates that there was a positive relationship between students' self-concepts and performance in Mathematics which is significant at 0.05. The value of r which is 0.563 shows a moderate relationship between the two variables.

RQ_4: How do male and female students differ for attitude toward mathematics?

Table 4 displays the results of the independent t-test of the attitude of students towards mathematics by gender (t_{200}= -0.295; p>0.05). The results indicated that although male students had a slightly higher mean (X=73.78) in their positive attitude toward mathematics than female students with the mean of (X=72.72), the mean difference was not statistically significant.

Discussion of Results

The first Research question of this study reveals that there was a positive relationship between students' attitude and performance in Mathematics. This corresponds with the findings of (Hackett & Benz, 1989; Tella & Tella 2005) that there was a significant relationship between attitude toward mathematics and performance in mathematics.

Several studies support the belief that self-concept tends to produce a commensurable change in academic achievement and attitude towards mathematics (Yara, 2010 & Adeyemo, 2005) which the findings of this study support. Othe studies by Adeyemo, (2005) and Gbore, (2006) demonstrated that study habits have a strong relationship with the academic achievement of students. The implication is that a student who cultivates certain study habits will perform differently from a student who has a different and less effective set of study habits.

Secondly, this study reveals that there was a relationship between study habits and self concept which was

significant at 0.05. Adeyemo (2005) and Gbore (2006) revealed a significant relationship between mathematical study habits and good performance in mathematics.

Moreover, there was a significant relationship between student self concept and performance in mathematics. The findings of this study support those of previous researchers in other cultures (Bandura, 1997; Largea, Sanni and Brew, 2014; Lashawn and Bacon, 2011) the direct effect of Mathematics self concept on mathematical performance.

Also, the findings of this study revealed that the attitude towards mathematics of the male and female respondents was not statistically significant. Although Pajares (1996); Tella and Tella (2005) and Oke (2005) report that boys and men tend to be more confident than girls and women in academic areas related to Mathematics, science and technology, there was no difference in attitude towards mathematics for these male and female secondary students in the selected schools. Further research on these students' performance in math, their attitudes toward mathematics, their self concept and their math teachers' attitudes and family support seems warranted at this time.

Based on the various findings on this study, it seems reasonable to recommend that secondary school students should be encouraged to view math as a subject they can master, and that their teachers should promote positive academic self concepts in their students. It is when students have the notion of their own personal worth and strong capacity to learn in their conscious and subconscious mind that they can begin to do well in a subject.

Mathematics teachers in Nigerian secondary schools are also called upon to always make Mathematics classes very interesting and engaging for students. By so doing, self-concept, good study habits and performances of the students in Mathematics will no doubt improve.

References

Adeyemo, B.J. (2005). Effect of study habit modification and test taking strategies on academic performance. Unpublished Ph.D thesis, Ekiti State University.

Ayodele, O.J. (2011). Self-concept and performance of secondary school students in Mathematics. *Journal of Educational and Developmental Psychology* 1(1), 176-184.

Bandura, H. (1997). *Self-efficacy, the exercise of control*. New York, Freeman.

Caraway, K. Trucker, C.M. & Hall, C. (2003). Self-efficacy, goal orientation and fear of failure as predictor of school students. *Psychology in the School* 40(1).

Constantine, M.G. & Blackmon, S.M. (2002). Black adolescent racial socialization at home, school and peer esteem. *Journal of Black Studies* 32(1).

Gbore, I. (2006). Cognitive entry characteristics of study habit and self concept as predictor of academic achievement of University Undergraduate in Southern Nigeria. An Unpublished Ph.D thesis, Ekiti State University, Ekiti State, Nigeria.

Kaalwik, E.M. & Ramkim, R.J. (1994). Gender differences in Mathematics and verbal Achievement. *British Journal of Educational Psychology* 64(1).

Largea, J.E., Sanni, A.I. & Brew, E.D. (2014). Influence of students self-concept on their academic performance in the Elmna township. *European Journal of Research and Reflection in Educational Science* 2(4).

Lashawn, C. B. (2011). Academic Self concept and academic achievement of African American student transitioning from urban to rural schools. Univeristy of Iwa, *IOWA Research* Online, summer, 2011

Odiri, O.A. (2015). Relationship of study habits with Mathematics achievement. *Journal of Education Practice* 6(10), 168-172.

Oke, D.I (2005). Socio-psychological factors of academic self-efficacy and achievement among secondary school students in Ondo State, Unpublished M.Ed. thesis UI.

Skaadvik, E.M. & Rankin, R.J. (1994). Gender differences in Mathematics and verbal achievement. *Journal of Educational and Developmental Psychology* 1(1), Dec 2011.

Tella, A.I. & Tella A. (2005). Self-efficacy and locus of control as predictor of academic achievement among secondary school students in Osun state university. *Oyo Journal of Educational Psychology* 1(1).

WAEC (2012). West African Examination Reports on SSCE result, Yaba, Lagos.

Wingfield, A. & Eccles, J.S. (1994). Children's competence beliefs, achievement in values and general self-esteem, change across elementary and middle schools. *Journal of Early Adolescence* 14(1).

Yara, P.O. (2010). Students self-concept and Mathematics achievement in some secondary schools in South-Western Nigeria. *European Journal of Social Science* 13(1) 127-132

———————————————

Prof. Usman Kamoru is a Provost, Federal College of Education (special) Oyo, Oyo State, Nigeria. P M B 1089, Oyo, Nigeria.

Dr. Olosunde Gbolagade Ramon is a Deputy Director, Degree and Diploma Programs, Federal College of Education (special) Oyo, Nigeria, PMB 1089, Oyo, Nigeria.