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The Relationship between Emotional Intelligence and Academic Achievement of Senior Secondary School Students in the Federal Capital Territory, Abuja

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Abstract
The purpose of this research was to determine whether there is a significant relationship between emotional intelligence and academic achievement of students in mathematics. To guide the study some research questions and hypotheses were generated. The research design for the study was correlation survey design. The instruments used for the study were the Emotional Intelligence Inventory and Mathematics Achievement Test. The Emotional Intelligence Inventory has reliability coefficient of 0.79 while the Mathematics Achievement Test has reliability coefficient of 0.94. The population for the study was the senior secondary school two students in public schools in the Federal Capital Territory, Abuja, Nigeria. Proportionate stratified sampling was used to select the sample (N=1160) for the study. The responses of the students to the instruments were scored and analyzed using mean and Pearson Product Moment Correlation. To test the level of significance of the correlation coefficient the t-test was used. The result showed that there was a significant low positive relationship between the emotional intelligence of SS2 students and their academic achievement in mathematics. The result also indicated that there was a significant low positive relationship between the emotional intelligence of SS2 male students, SS2 female students, urban school students, and rural school students, and their academic achievement in mathematics. It was therefore concluded that apart from cognitive factors, emotional intelligence of students also affects their academic achievement in mathematics. It is recommended that there is need to include emotional intelligence curriculum in schools.
Keywords: Emotional Intelligence, Academic Achievement, Relationship

1. Introduction

The desire of any educational system is to produce students who are sufficiently trained to contribute meaningfully to the development of the system and the society in general. Among all academic subjects studied at school, mathematics has distinctly contributed more to the objectives of general education of man than any other subject. Despite the importance of mathematics to the nation, a review of the performance in both internal and external examinations has revealed a disturbing picture. Students are seen to perform poorly in most mathematics examinations. This is giving grave concern to educators, parents, students, school administrators and the general public. For instance, the West African Examination Council results of students in Nigeria show that students perform poorly. In the years 2008, 2009, 2010 and 2011 the percentage pass with credit and above in Nigeria were 23.0%, 31.0%, 24.94% and 38.98% respectively (Kurumeh & Imoko 2008; Moseri, Onwuka & Iweka 2010; Iyi 2011). One of the factors adduced to this is the Intelligence Quotient (IQ) of the student. The level of IQ has been shown to be a predictor of the level of academic achievement of students in all subjects including mathematics.

But in this century, intelligence and success are not viewed the same way they were before (Goleman 1995). New theories of intelligence have been introduced and are gradually replacing the traditional theory. The whole child/student has become the center of concern, not only his reasoning capacities, but also his creativity, emotions and interpersonal skills. The multiple intelligence theory has been introduced by Gardner (1983) and the Emotional intelligence theory by Mayer and Salovey (1990) and then Goleman (1995). IQ alone is no more the only measure for success; emotional intelligence, social intelligence, and luck also play a big role in a person's success (Goleman 1995).

Apart from the traditional IQ, Emotional Intelligence (EI) is seen by researchers to posses the ability to fully explain performance outcomes (Gardner, 1983). Emotional Intelligence is defined as ''The ability to monitor one's own and others' feelings and emotions, to discriminate among them and to use this information to guide ones thinking and actions (Salovey & Mayer 1990*)*.

There is a connection between emotion and cognition. Mayer, Salovey and Caruso (2000) viewed emotion as one of the three fundamental classes of mental operations which include motivation, emotion and cognition. There is the notion that having positive quality emotions and feelings help students to achieve and give their best potential in the classroom (Fazura & Ghazali 2003). As such teachers should understand that any stress on the affective domain of the learners would affect their cognitive domain in classroom. As such,

teaching emotional and social skills at school is important as these skills have long term effects on achievement. Also, research in brain based learning suggests that emotional intelligence is fundamental to effective learning. Hence, EI is being incorporated in the school curriculum and training programmes in some organizations to achieve their objectives (Funderstanding, 2008). According to Goleman (1995), IQ alone is no more a measure of success, it accounts for 20% and the rest (80%) goes for emotional, social intelligence and luck. These statements have attracted attention of educators and educational policy makers.

A study by Nada showed a significant relationship between Emotional intelligence and academic achievement of the pupils (Nada 2000). Another study on Emotional Intelligence of at- Risk Students in Malaysian Secondary Schools was conducted (Habibah et al. 2007). The study was conducted to determine the level of emotional literacy of at-risk students and to examine the relationship between emotional literacy and several psychological variables namely, achievement motivation, self-esteem and self-efficacy among at- risk students. Findings indicate that the mean EIQ of at- risk students were rather low (mean = 57.67, SD = 0.26). The mean scores for the three sub-scales of EIQ among the students were 18.91 for Emotional self-Awareness (ESA), 14.94 for Emotional Expression (E E) and 24.18 for Emotional Awareness of Others (EAO). Research findings by Habibah et al. also indicate significant gender differences ($t = 4.103$, $P < .05$) in EIQ scores among at – risk students with female students obtained a higher mean compared to the Males. In addition results also showed positive and significant correlation between EIQ and the following variables namely academic achievement, self – esteem, achievement motivation, mathematics self – efficacy and English self-efficacy.

Rahil, Maria, Samsilah, Habibah & Tajularipin (2007) studied the relationship between Emotional Quotient and the Acquisition of Basic Skills among Primary School children. The objective of this study was to find out whether there is a relationship between EIQ and children's acquisition of basic skills. It was carried out on 344 primary school students of which 167 were from year 1 and 177 were year 4 students. Out of the total 176 were from rural schools and 168 from urban schools. They are from academically weak classes. Rahil et al. (2007) found out that the mean EQ for level 4 students is 3.32 (sd = .44) which is considered as high while the mean EQ for level 1 students is 2.92 (sd = .39) which is considered moderate as compared to the population mean. For the very weak students; the mean EQ for level 1 is 1.88 (sd = .46) and for level 4, the mean is 2.3 and sd = 0.52. It can be seen that the very weak students have lower EQ compared to other students who are themselves weak academically. It was found out that there is significant difference between EQ of students in level 4 and students in level 1. Also, though the EQ level for rural school children is slightly higher than the urban school children, the t-test shows there is no significant difference between the two groups. This means that the school location is not a factor in the level of EQ. The results show that there is a positive correlation between EQ level and emotional readiness for school. Therefore, it can be said that children have to be emotionally ready so as to acquire positive development of EQ. However the preliminary findings indicated that there is a positive correlation between EQ and basic skill acquisition.

Habibah et al. (2007) reported a study conducted by Mayer, Caruso and Salovey in the year 2000 on 503 adults (164 Men and 339 women) with a marriage of 23 years (range: 17 - 70) which showed that women were found to outperform than men on the 12 tasks of the multifactor Emotional intelligence scales (MEIS) in all the scoring procedures. Rahil et al. (2007) reported that Pasi (1997) studied on students who were given lessons in emotional intelligence across the curriculum. She found that emotional well-being was a predictor of success in academic achievement. They also reported that Bloodworth and Weissberg in 2001 found out that several types of evidence link students' social and emotional competence to academic performance.

However, some researchers have shown that the relationship between EI and academic performance is uncertain given that empirical research has shown a weak relationship between EI and academic performance, and the results vary dramatically depending on the operationalization of the academic performance variable (Audrey& Eagan 2007).

In Nigeria, not much attention has been focused on exploring EI in the school system and in the teaching of mathematics. Many teachers, educationists, schools and students in Nigeria have little or no idea of emotional intelligence and its effects on learning. This is evident in the lack of literature on this subject in Nigeria. The consideration of factors affecting success in secondary schools in Nigeria often neglects the role of non-cognitive variables including emotional intelligence (EI). Hence, EI is not part of the curriculum of any subject including mathematics. This gap in knowledge exists in the midst of poor performance of students in schools as revealed by WAEC results. Hence, objective of the study was to determine the mean EIQ level of students and the extent of the relationship between the EIQ of students and their academic achievement in mathematics.

2. Statements of Hypotheses.

To guide study the following hypotheses were tested at 0.05 level of significance:

$H0_1$ There is no significant relationship between EI and academic achievement of SS2 students in mathematics.

$H0_2$ There is no significant relationship between EI of SS2 male students and their academic achievement in mathematics.

$H0_3$ There is no significant relationship between EI of SS2 female students and their academic achievement in mathematics.

$H0_4$ There is no significant relationship between EI of urban school SS2 and their academic achievements in mathematics.

$H0_5$ There is no significant relationship between EI of rural SS2 students and their academic achievement in mathematics.

3. Methodology

3.1 Research Design

In this study a correlational survey research design was employed. This was used to determine if there is any relationship between EI and academic achievement of SS11 students in mathematics. The EIQ of the students was correlated with their scores in the mathematics achievement test.

3.2 Sample

The population for this study was the Senior Secondary School two students in public schools in Abuja. A sample of 1160 Senior Secondary two students (Boys and Girls) representing about 10% of the population was selected using proportionate stratified random sampling from the Public Senior Secondary Schools in FCT, Abuja. The students were selected using proportional stratified random sampling method making sure that school locations (Councils areas, Urban and Rural), Gender (Boys and Girls) and Abilities (high, middle and low achievers) were appropriately represented.

3.3 Instrumentation

Two instruments were used for the study:

3.3.1.Emotional Intelligence Inventory (EII)

To measure the Emotional Intelligence of students, Emotional Intelligence Inventory (EII) for adolescents developed by Farn-Shing, Ying- Ming, Ching-Yua and Chia-An (2007) was adapted. This Emotional intelligence inventory consists of 35 questions. The EII scale is divided into six factors. The first factor is Facilitating Thought (FT), Emotional Management (EM), Emotional Perception (EP) , Emotional Awareness (E A), Emotional Concern of Others (ECO), and Emotional Control (EC). The reliability coefficient for the adapted EII is 0.79.

3.3.2 Mathematics Achievement Test (MAT).

On the other hand, the achievement of SSI1 students in Mathematics was measured using a Mathematics Achievement Test developed and validated by the researcher for the study. The Mathematics Achievement Test (MAT) covered all the Themes in the National Mathematics Curriculum for Senior Secondary two students in Nigeria published by the Nigerian Research and Development Council (NERDC). There were 50 questions. The reliability coefficient of the total test was determined using split half method and Spearman – Brown's formula and the value was 0.94.

3.3.3 Administration of Instruments

The EII and the Mathematics Achievement Test was administered in the selected schools. The schools were visited to administer and collect the questionnaires back after completion. Mathematics teachers in the schools assisted in administering the EII and the Mathematics Achievement Text to the students. The completion of the EII took about 15 minutes while the Mathematics Achievement Text took about one hour thirty minutes.

3.3.4 Procedures for Statistical Analysis

The mean EIQ for all the students, males, females, urban schools and rural schools students were determined. To determine the relationship between Emotional Intelligence and students' academic achievement in mathematics, both the EIQ scores and students' scores in Mathematics Achievement Test (MAT) were recorded. Then, the Pearson Product Moment Correlation was used to determine the extent of the correlation between emotional intelligence and academic achievement of students in mathematics or not. Also t – test was used to further determine if the relationships were significant.. All the tests of the hypotheses were at the 0.05 level of significance.

4. Results

The mean Emotional Intelligence Quotient (EIQ) and MAT Scores of SS2 Students sample for the study are shown below:

Table 1: Mean Emotional Quotient (EIQ) and MAT Score of SS2 Students.

Variable	Mean MAT Score	Mean EQ Score
Male	17.212 (34.42%)	122.920 (70.24%)
Female	15.195 (30.39%)	123.156 (70.37%)
Urban Schools	16.756 (33.51%)	121.972 (69.70%)
Rural Schools	15.842 (31.68%)	123.840 (70.77%)
SS II in FCT (General)	16.367 (32.73%)	122.917 (70.24%)

The table above shows the Mean EIQ for SS II students in FCT is 122.917 representing 70.24%. The Mean EIQ Score for the Male Students is 70.24% while that of the Females is 70.37%. The Mean EIQ Score for Urban Schools is 69.70% while that of Rural Schools is 70.77%. The table also shows that the Mean Score of the Students in the mathematics achievement test (MAT) for the SS II students is 32.73%. For all the other variables studied, the Mean Score in Mathematics Achievement Test (MAT) ranges from 30.39% to 34.42%.

4.1.Test of Null Hypothesis H_{0_1}: There is no significant relationship between Emotional Intelligence (EI) and academic achievement of SS2 Students in Mathematics.

Table 2: Results of Pearson Product Moment Correlation Analysis of EI and Academic Achievement of Students in Mathematics

Number of Students	Correlation Coefficient(s)	Degree of Freedom (N-2)	Calculated t-value	Critical t-value
1160	0.3854	1158	14.21	1.96

The table above shows that the correlation coefficient between EI of SS2 and their academic achievement is 0.3854. This implies that there is a low positive correlation between Emotional Intelligence of SS II students and their academic achievement in mathematics. Also, since the t- value calculated (14.21) is more than the t-table value (1.96), the correlation is significant. Thus, there is a significant low positive relationship between Emotional Intelligence and academic achievement of students in mathematics.

4.2.Test of Null Hypothesis H_{0_2}: There is no significant relationship between E.I. of SS2 Male students and their academic achievement in mathematics.

Table 3: Results of Pearson Product Moment Correlation Analysis of EI and Academic Achievement of SS2 Male Students in Mathematics

Number of Male Students	Correlation Coefficient	Degree of Freedom	Calculated t-value	Critical t-value
674	0.3935	672	11.10	1.96

The table above shows that the correlation coefficient between EI of SS2 male students and their academic achievement in mathematics is 0.3935 and the t- calculated value of 11.10 is more than the t-table value of 1.96. These imply that there is a significant low positive relationship between Emotional Intelligence of SS II male students and their academic achievement in mathematics.

4.3.Test of Null Hypothesis H_{0_3}: There is no significant relationship between the Emotional Intelligence of SS2 Female students and their academic achievement in mathematics.

Table 4: Results of Pearson Product Moment Correlation Analysis of Emotional Intelligence and Academic Achievement of SS2 Female Students

Number of Female Students	Correlation Coefficient	Degree Freedom (N-2)	Calculated t-Value	Critical t-Value
486	0.3905	484	9.33	1.96

The table above shows that the Correlation Coefficient between the Emotional Intelligence of SS2 Female students and their academic achievement in mathematics is 0.3905. Also, the t- calculated value of 9.33 is more

than the t- critical value of 1.96. These indicate that there is a significant low positive relationship between Emotional Intelligence of SS2 female students and their academic achievement in mathematics.

4.4.Test of Null Hypothesis H_{O_4}: There is no significant relationship between the Emotional Intelligence of Urban School SS2 students and their academic achievement in mathematics.

Table 5: Results of Pearson Product Moment Correlation Analysis of Urban Schools SS2 Students and their Academic Achievement in Mathematics

Number of Students	Correlation Coefficient	Degree of Freedom (N-2)	Calculated t-Value	Critical t-Value
673	0.4610	671	13.46	1.96

The result in the table above shows that the correlation coefficient between the Emotional Intelligence of Urban School SS2 students and their academic achievement in mathematics is 0.4610. Also the calculated t-value of 13.46 is greater than the critical t-value of 1.96. These imply that there is a significant low positive relationship between the Emotional Intelligence of Urban School SS2 students and their academic achievement in mathematics.

4.5. Test of Null Hypothesis H_{O_5}: There is no significant relationship between Emotional Intelligence of Rural School SS II Students and their academic achievement in mathematics.

Table 6: Results of Pearson Product Moment Correlation Analysis of Rural School SS2 Students and their Academic Achievement in Mathematics

Number of Students	Correlation Coefficient (r)	Degree of Freedom (N-2)	Calculated t-Value	Critical t-Value
487	0.3008	485	10.73	1.96

The table above shows that the correlation coefficient is 0.3008 and the calculated t-value of (10.73) is more than the critical t-value of 1.96. These show that there is a significant low positive relationship between the Emotional Intelligence of Rural School SS2 Students and their academic achievement in mathematics.

5. Discussion, Conclusion and Recommendations

The study revealed that the average Emotional Intelligence Quotient for SS2 students is 70.24%. This is relatively high compared to the Emotional Intelligence Quotient of at- risk students in Malaysian Secondary Schools which was 57.66 (Habibah et al 2007). At risk students in their study were confined to students who are low in academic performance and with discipline problems. Since the students covered by this present study in Nigeria were not all low achievers it is then expected that their mean EIQ would be higher. These results support the findings by other researchers that EIQ positively correlates with students' academic performance (Nada, 2000; Habibah et al. 2007; Rahil et al. 2008).

The mean EIQ for the SS2 male students is 70.24% while that of female students is 70.37%. These showed that the mean EIQ for the SS2 female students is slightly higher than that of the SS2 male students. This result supports the earlier results by Mayer, Caruso and Salovey (2000); Habibah et al (2007); Audrey and Eagan (2007); Svetlana (2008); and which showed that the EIQ of females is higher than that of males. One of the reasons why girls show higher level of emotional intelligence compared to boys is due to the fact girls receive significantly more education on emotions from parents than do the boys that make them more emotionally competent than boys as observed by Shilling in Habibah et al (2007). Boys are always perceived as stronger person compared to girls and as a result their emotional needs are often neglected and more attention is given to the girls. This situation is also true in Nigerian situation. The girls are more protected by parents than the boys in many parts of the country.

From this study the mean EIQ for urban school students is 69.70% while that of rural school students is 70.77%. Thus, the EIQ of rural schools is slightly higher than that of urban schools. This result supports the result of earlier study by Rahil et al (2007) which reported that the EIQ level for rural school children is slightly higher than the urban school children. However, in their study the t-test shows that there is no significant deference between the two groups. This means that the school location is not a strong factor in the level of EIQ. Also in this study it could be seen that the difference between the mean for the rural and urban schools is very slight. However, a possible reason for the slight difference is the environmental factor. This is because where a child stays usually affects his conduct and emotional state of mind. What one sees and experiences in an environment would usually affect his reaction to issues and emotional well-being.

From hypotheses tested for this study, the result showed that there is a fairly strong and significant relationship between the emotional intelligence of SS2 students and their academic achievements in mathematics. The result of this study also revealed a fairly strong and significant relationship between SS2 male students, SS2 female students, urban school students and rural school students; and their academic achievements in mathematics. The result of this study confirms the results of several earlier researcher which found a significant positive correlation between EIQ and academic achievements (Nada 2000; Habbibah et al. 2007; Rahil et al. 2007; James & Christopher in Chris 2008; Audrey & Eagan 2007; Svetlana 2008; Mayer, Caruso & Salovey 2000). It is thus the agreement of many researchers that there is a positive and significant relationship between EIQ and academic achievement of students. The correlation coefficient for the relationship between the emotional intelligence and academic achievement in mathematics for all the students, males students, female students, urban school students and rural school students are 0.3854, 0.3935, 0.3905, 0.4610 and 0.3008 respectively. These support the findings by Habibah et al. (2007) which reported a relationship between EIQ and mathematics self efficacy as $r=0.310$, $p<.05$ and Audrey and Eagan (2007) which reported that the ordinary least square (OLS) regression between EI and students academic performance as 0.40. The relationship between EIQ and academic performance of students could be explained from the point that the way one feels affects the way one thinks. A person who is in a good mood tends to think positively and vice versa. When a student is emotionally destabilized he can never think and concentrate during lessons. Children who are not well cared for and maltreated at home do not well in the school. A case in point is problem of house helps who are not well treated by their Guardians. These support the fact that there is close connection between affective domain and the cognitive domain of learning. Whatever happens to the affective domain would definitely affect the performance of the cognitive domain. Thus, in finding solutions to the poor academic achievement of students in mathematics, some attentions need to be directed to the development of the affective domain of the students.

Generally it could be seen from the results of several studies that the correlation coefficient between EIQ and academic achievement of students are less 0.5. This is a pointer to the fact that emotional intelligence is just one of the several factors determining the academic achievement of the students. Thus, while efforts are being made to develop the emotional intelligence of students, we still have to focus attention to other factors affecting the academic performance of students**.**

Based on the results of this research, it is hereby concluded that: (a) Apart from cognitive factors, non-cognitive factors including emotional intelligence affect students' academic success. Since we cannot manipulate the IQ of students and we can improve the emotional intelligence of students by training, then manipulating the emotional intelligence of students may be a sure way of improving the performance of students in mathematics. (b)Sex of students does not matter in the relationship between emotional intelligence and academic achievement of students in mathematics. (c) School location does not matter in the relationship between emotional intelligence and academic achievement of students in mathematics. (d)The Emotional Intelligence Quotient (EIQ) for students needs to be improved upon.

The recommendations arising from the results of this study are: (a) Other factors in addition to traditional intelligence should be taken into consideration in recruiting, training and retaining students at schools. (b) There should be emotional intelligence curriculum for students in schools. There should be emotional intelligence training for teachers and school administrators in schools. (c)The general administration of the school should put the emotional stability and emotional intelligence development of students into consideration in their activities. (d) Parents need to pay more attention to the emotional intelligence development of their children especially the male children.(e) In recruiting teachers, recruiting and training of student teachers, there is need to consider their emotional intelligence quotients

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