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SOCIAL INTELLIGENCE AS CORRELATE OF ACADEMIC ACHIEVEMENT IN MATHEMATICS AMONG SENIOR SECONDARY SCHOOL STUDENTS IN UMUAHIA NORTH LGA OF ABIA STATE

By

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Abstract

This study determine the extent social intelligence and locus of control correlates with academic achievement in Mathematics among senior secondary school students in Abia State. The study adopted a correlational research design. Specifically, six research questions and six null hypotheses guided the study. The population of the study consisted of 8,783 2024/2025 senior secondary school class II (SS II) in Abia State. A sample of 878 senior secondary school class II students drawn through multistage sampling techniques was used for the study. The instruments for data collection were a 31-item researcher developed questionnaire titled "Students' Social Intelligence Questionnaire (SSIQ)"and "Students academic Achievement in Mathematics Test (SAAMT). The instruments were validated by three experts one from educational guidance and counselling, one from Educational Psychology and one from Educational Measurement and Evaluation, all in College of Education, Michael Okpara University of Agriculture, Umudike, Abia State. Pearson product moment correlation statistic was used to determine the stability of the two instruments which yielded overall reliability indices of .50 while Cronbach Alpha was used to determine the internal consistency which yielded an overall coefficient of .92. Pearson Product Moment Correlation was used to answer the research questions raised for the study while Linear Regression Analysis was used to test the null hypotheses at 0.05 level of significance. Social Awareness, Social Skills to a very high extent relate to academic achievement in Mathematics in among senior secondary school students in Abia State. Finally the study revealed that the joint variable of social intelligence (Social awareness and Social Skills) and locus of control (Internal and External) to a very high extent relate to academic achievement in Mathematics in among senior secondary school students in Abia State. The study therefore recommend among other that school administrators should focus on creating inclusive learning environments that promote active listening, emotional support, and cross-cultural understanding.

Keywords: Social intelligence, Mathematics and Academic achievement

Introduction

Mathematics is defined as the bedrock of Science and Technology and economic strength of any nation. The word mathematics originated from the Ancient Greek language" Mathema" meaning science, an organized body of knowledge or structural skill for effective learning.

The importance of mathematics amongst students in secondary schools is well articulated in the school syllabus. Its significance and usefulness makes it possible for the subject to be taught every day in all secondary schools in Nigeria. Thus, in the National Policy on Education (NPE), the federal government of Nigeria gives prominence to mathematics by making it a core subject amongst several school subjects in the secondary school level FRN (2014).

Irrespective of the relevant importance of mathematics in the overall economic and technological development of Nigeria and Abia state in particular, as well as being a compulsory subject at both the primary and secondary school level of education, students achievement in it has been very poor (Uba, Umoinyang & Afolabi, 2017). The poor achievements in mathematics have been confirmed by the recent West African Examinations Council's reports from 2019 – 2023. For instance, the WAEC result analysis reviewed that only 40.34%, 35.69%, 30.71%, 42.60% and 50.38% of the candidates obtained credit pass and above in the years 2019, 2020, 2021, 2022 and 2023 respectively (Alade, Aletan & Sokenu, 2023). A total of 1.53 million candidates sat for the West African Examination in the year 2019, while in the same year Abia state came up with a good result in WAEC occupying the 2nd position. From my investigation the schools that did very well in Mathematics in Abia State were private schools not Government owned schools. This was one of the reasons that motivated researcher to carry out this research in Abia State among government owned secondary schools.

Academic achievement refers to what students accomplish in their studies as well as how they deal with or complete various learning experiences provided by their instructors. According to

Ibrahim (2015), success in educational institutions is evaluated by academic achievement, or how effectively a student fulfills the institution's goals. Academic achievement as opined by Narad and Abdullah (2016) refers to the knowledge gained which is assessed by marks by a teacher and/or educational goals set by students and teachers to be achieved over a specific period of time.

Operationally, social intelligence is a very important variable that helps the students in acquiring high academic achievement. Social intelligence helps in the academic achievement of students. Social intelligence (SI) is the person's ability to understand and manage interpersonal relationship. It is distinct from a person's (IQ) Intelligent Quotient or "book smarts". It also includes an individual's ability to understand and act on emotional feelings, thoughts and behaviours of other people. The theory of social intelligence was first propounded by an American psychologist Edward Thorndike in the year 1920, he defined it as the "ability to understand and manage man and woman and boys and girls to act wisely in human relations". No one is born socially intelligence.

Social Intelligence is the ability to understand one's own ability and others actions. Social intelligence is learned and develops from experience with people and learning from success and failure in social settings. It is an important interpersonal skill that helps individuals to succeed in all aspects of their lives (Wikipedia, 2022).

There are some components of social intelligence and they include:

1. Communication skills and verbal fluency.
2. Ability to understand and observe other people.
3. Impression management skills.
4. Observation skills.
5. Improving emotional intelligence.
6. Strong listening skills.
7. Self-efficacy in the social context

The five characteristics of social intelligence includes:

Social intelligence is the ability to know oneself and to know others in order to evaluate our own and other peoples actions properly.

1. Sympathy
2. Self –Awareness
3. Empathy
4. Meta –Cognition
5. Theory of mind

Sympathy: Is the feeling of pity and sorrow for someone else's misfortune, it also means understanding between people with common feelings.

Self-Awareness: This means conscious knowledge of one's character and feelings. Self-awareness is the knowledge of self in three basic areas, which includes (1) cognitive (2) physical (3) emotional. It also the ability to recognize your own feelings, behaviors and character. Being self-aware can help you take better care of yourself, have deeper relationships and live more fulfilling life.

Empathy: Empathy is the ability to share another person's feelings and emotions as if they were your own. It is a broad concept that refers to the cognitive and emotional reactions of an individual to observed experiences of another. Having empathy increases the likelihood of helping others and showing compassion.

Meta-Cognition: Is the awareness/understanding of one's self. Is the process of thinking about oneself, own thinking and learning. Meta-Cognition intentional thinking about the way you think and learn.

Theory of mind; is the capacity to understand other people by ascribing mental states to them, Theory of mind research helps to investigate children's understanding of people as mental being who have beliefs, desires, emotions and intentions and whose actions. Psychologically speaking, is an important social –cognitive skills that involves the ability to think about mental states both your own, the concept of theory of mind is easily found in developmental

psychology and social psychology respectively that refers to ability to understand and attribute mental.it also frames and interpret perceptions of human behavior in a particular way as perception of agents who can act intentionally. Baron Cohen's theory of mind drew from comparative psychology from developmental and from neuropsychology. He argued that specific neurocognitive mechanism have evolved that allow us to mind read, and make sense of action to interpret gazes that is meaningful, to decode' the language of the eyes.

Statement of the problem

Mathematics is an organized body of knowledge that focuses on such concepts as quantity, quality, structure, space, number, and change, and also a multi-disciplinary field that studies its interaction with other fields in human endeavors. Yet, the interest and achievement of students in Mathematics at various levels of education especially secondary schools in Abia state have remained unsatisfactory. Students engaged in the study of Mathematics tend to see the subject as boring, energy sapping, meaningless, and uninvolving. Regardless of the relative value and benefit of Mathematics in the general economic, scientific, and entrepreneur development and the huge involvement of government and other stake holders in supporting the promotion of the subject, students' achievements in this core subject seem to have been relatively very poor. Teachers, parents, curriculum experts and evaluators has expressed their concerns and it is believed that if the poor achievement in Mathematics remains unchanged, it may likely have adverse effect to both the economic, technological and entrepreneurial growth of Nigeria.

Evidence emanating from Western Europe tends to suggest that social intelligence and locus of control factors might have the potential of improving students' achievement in mathematics. However, the extent to which social intelligence correlate with mathematics achievement of secondary school students in Abia State who operate in different socio-economic circumstances is yet to be determined to the best of the researcher's knowledge. Therefore, the problem of this

study is to determine the extent social intelligence (social awareness, social skills) correlates with academic achievement in mathematics among secondary school students in Abia State.

Purpose of the study

The purpose of this study was to determine the relationship between social intelligence and academic achievement in mathematics among senior secondary school students in Umuahia North LGA of Abia State. Specifically, the objectives are to:

1. examine the correlation between social awareness and academic achievement of students in Mathematics
2. examine the correlation between social skills and academic achievement of students in Mathematics.
3. find out the extent joint social intelligence (social awareness and social skills) correlate with academic achievement of students in Mathematics.

Research Questions

The study was guided by the following research questions.

1. To what extent does social awareness correlate with academic achievement of students in Mathematics?
2. To what extent do social skills correlate with academic achievement of students in Mathematics?
3. What is the extent joint social intelligence (social awareness and social skills) correlate with academic achievement of students in Mathematics.

Hypotheses

The following null hypotheses were tested at 0.05levels of significance to guide the study

H_{O1}: There is no significant relationship between social intelligence and academic achievement of students in mathematics.

H_{O2}: Social assimilation will not have significant relationship with academic achievement of students in mathematics.

Methodology

The study adopted correlational research design. It study was carried out in Abia State. The population of the study consisted of 8,783 SS2 Students. A sample of 878 SS2 students were drawn through multi stage sample techniques used for the study. Two instruments were developed by the researcher for the study which are Students' Social Intelligence Questionnaire (SSIQ) and "Students academic Achievement in Mathematics Test (SAAMT). The instruments were face validated by three experts. Two from psychology and counselling department and one from measurement and evaluation unit all in College of Education, Michael Okpara University of Agriculture Umudike, Umuahia Abia State. The reliability of the instruments was determined by administering it to 30 students in Ibeku High School Umuahia,. it was re-administered to the same set of students after a period of two weeks. The stability was computed using pearson product moment correlation coefficient. The researcher and her research assistant distributed the copies of the questionnaires to the respondents through direct delivery and recovery method to ensure high percentage of recovery**.**

4.1 Results

The results of the study were presented in tables and based on the research questions and the hypotheses that guided the study.

Research Question One

To what extent does social awareness correlate with academic achievement of students in Mathematics?

Data for answering research question 1 are presented in Table 4.1.

Table 1: Correlation Matrix of Relationship between social awareness and academic achievement of students in Mathematics

		SA	AASM
SA	Pearson Correlation	1	.731**
	Sig. (2-tailed)		.000
	N	878	878
	R^2	.534 (53.4)	
AASM	Pearson Correlation	.731**	1
	Sig. (2-tailed)	.000	
	N	878	878

**. Correlation is significant at the 0.01 level (2-tailed). SA = Social Awareness; AASM = Academic Achievement of Students in Mathematics

Data in Table 4.1 indicate a correlation coefficient (r) of .731 which is positive and within the coefficient limit of ± 70-1.00 and above indicating strong, positive and a very high extent relationship. This however implies that social awareness of students to a very high extent relate to academic achievement in Mathematics. The coefficient of determination (R^2) of 0.534 indicates that 53.4% of the variance observed in the academic achievement of students in Mathematics, was accounted for, by their social awareness of the students.

Hypothesis One

There is no significant correlation between social awareness and academic achievement of students in Mathematics.

Data for testing hypothesis 1 are presented in Table 4.2.

Table 2: Linear Regression Analysis of the Relationship between social awareness and academic achievement of students in Mathematics.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	243297.698	1	243297.698	1003.902	.000[b]
Residual	212300.063	876	242.352		
Total	455597.761	877			

The data in the Table 4.2 showed a probability (P) - value of 0.000 which is less than the alpha value 0.05. Since the P-value is less than 0.05 alpha value, the hypothesis of no significant

relationship was rejected. Therefore, there is significant correlation between social awareness and academic achievement of students in Mathematics.

Research Question Two

To what extent do social skills correlate with academic achievement of students in Mathematics?

Data for answering research question 2 are presented in Table 4.3.

Table 3: Correlation Matrix of Relationship between social skills and academic achievement of students in Mathematics

		AASM	SS
AASM	Pearson Correlation	1	.944**
	Sig. (2-tailed)		.000
	N	878	878
	R^2	0.892 (89.2)	
SS	Pearson Correlation	.944**	1
	Sig. (2-tailed)	.000	
	N	878	878

**. Correlation is significant at the 0.01 level (2-tailed); SS = Social Skills;
AASM = Academic Achievement of Students in Mathematics

Data in Table 4.3 indicate a correlation coefficient (r) of .944 which is positive and within the coefficient limit of ± 70-1.00 and above indicating strong, positive and a very high extent relationship. This however implies that social skills of students to a very high extent relate to academic achievement in Mathematics. The coefficient of determination (R^2) of 0.892 indicates that 89.2% of the variance observed in the academic achievement of students in Mathematics, was accounted for, by students' social skills.

Hypothesis Two

There is no significant correlation between skills awareness and academic achievement of students in Mathematics.

Data for testing hypothesis 2 are presented in Table 4.4.

Table 4: Linear Regression Analysis of the Relationship between social skill and academic achievement of students in Mathematics.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	406271.999	1	406271.999	7215.174	.000[b]
Residual	49325.762	876	56.308		
Total	455597.761	877			

The data in the Table 4.2 showed a probability (P) - value of 0.000 which is less than the alpha value 0.05. Since the P-value is less than 0.05 alpha value, the hypothesis of no significant relationship was rejected. Therefore, there is significant correlation between social skills and academic achievement of students in Mathematics.

Research Question Three

What is the extent joint social intelligence (social awareness and social skills) correlate with academic achievement of students in Mathematics.

Data for answering research question 3 are presented in Table 4.5.

Table 5: Correlation Matrix of Relationship between joint social intelligence (social awareness and social skills) and academic achievement of students in Mathematics.

		SA	SS	AASM
SA	Pearson Correlation	1		.731**
	Sig. (2-tailed)			.000
	N			878
SS	Pearson Correlation		1	.944**
	Sig. (2-tailed)			.000
	N			878
AASM	Pearson Correlation			1
	Sig. (2-tailed)			.950
	N	**878**		**878**

**. Correlation is significant at the 0.01 level (2-tailed); SA = Social Awareness; SS = Social Skills; AASM = Academic Achievement of Students in Mathematics

Data in Table 4.13 indicate a correlation coefficient (r) of .731 for social awareness which is positive and within the coefficient limit of ±0.80 and above indicating strong, positive and a very high extent relationship. This however implies that social awareness of students to a very high extent relate to academic achievement in Mathematics. The data in Table equally revealed a correlation coefficient (r) of .944 for social skills which is positive and within the

coefficient limit of ±0.80 and above indicating strong, positive and a very high extent relationship. This also implies that social skills of students to a very high extent relate to academic achievement in Mathematics. Finally, Table 4.5 summarily reveal a correlation coefficient (r) of .950 which is positive and within the coefficient limit of range of 0.80 and above indicating very high extent relationship. This indicates social intelligence of students to a very high extent relate to their academic achievement in Mathematics.

To determine the relative contributions of social intelligence (social awareness and social skills) on academic achievement of students in Mathematics, a Scheffe test was carried out and the predictive indices of students academic achievement in mathematics are presented as shown in Table 4.6 below:

Table 6: Scheffe Test on Relative Contributions of social intelligence (social awareness and social skills) on academic achievement of students in Mathematics.

		SA	**SS**	**AASM**
SA	Pearson Correlation	1		.731(43.64)
	Sig. (2-tailed)			.000
	N			878
SS	Pearson Correlation		1	.944(56.36)
	Sig. (2-tailed)			.000
	N			878
AASM	Pearson Correlation			1
	Sig. (2-tailed)			.950 (56.72)
	N	**878**		**878**

Table 4.6 shows that the predictive indices of students' academic achievement in mathematics on social awareness and social skills are .731 and .944. These however represent 43.64 and 56.36 percentages of relative contributions of social awareness and social skills. In other words, Social Skills had the highest percentage contribution of 56.36%, followed by social awareness with 43.64%.

Hypothesis Three

Joint social intelligence (social awareness and social skills) does not significantly correlate with academic achievement of students in Mathematics.

Data for testing hypothesis 3 are presented in Table 4.7.

Table 7: Linear Regression Analysis of the Relationship Joint social intelligence (social awareness and social skills) does not significantly correlate with academic achievement of students in Mathematics.

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	432629.071	2	216314.536	8240.554	.000[b]
Residual	22968.689	875	26.250		
Total	455597.761	877			

The data in the Table 4.7 showed a probability (P) - value of 0.000 which is less than the alpha value 0.05. Since the P-value is less than 0.05 alpha value, the hypothesis of no significant relationship was rejected. Therefore, Joint social intelligence (social awareness and social skills) significantly correlate with academic achievement of students in Mathematics in senior secondary school students in Abia State, Nigeria.

The results revealed as follows:

1. social awareness of students to a very high extent relate to academic achievement in Mathematics. The coefficient of determination (R^2) of 0.534 indicates that 53.4% of the variance observed in the academic achievement of students in Mathematics, was accounted for, by their social awareness of the students.
2. social skills of students to a very high extent relate to academic achievement in Mathematics. The coefficient of determination (R^2) of 0.892 indicates that 89.2% of the variance observed in the academic achievement of students in Mathematics, was accounted for, by students' social skills.

3. predictive indices of students' academic achievement in mathematics on social awareness and social skills are .731 and .944. These however represent 43.64 and 56.36 percentages of relative contributions of social awareness and social skills. In other words, Social Skills had the highest percentage contribution of 56.36%, followed by social awareness with 43.64%.

Conclusion

This study underscores the significant role that social intelligence play in influencing the academic achievement of senior secondary school students in Mathematics within Abia State. The findings reveal that social awareness, social skills, and a combination of both (joint social intelligence) are strongly linked to students' academic success in Mathematics. The results emphasize the need for educators and policymakers to foster students' social intelligence as it contributes substantially to academic performance.

Recommendations

Based on the findings and conclusions of the study, the following recommendations were made.

1. School administrators should focus on creating inclusive learning environments that promote active listening, emotional support, and cross-cultural understanding.
2. Educators should create opportunities for collaborative learning and foster a supportive environment that encourages students to practice and refine their social skills.
3. Teachers should emphasize the development of students' social awareness by promoting empathy and inclusivity, while also fostering social skills through collaborative activities.

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