Influence of Emotional Intelligence on Mathematics Achievement of Students of Public Senior Secondary Schools in Rivers State

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Abstract: *This study investigated the influence of emotional intelligence on Mathematics achievement of students of public senior secondary schools in Rivers State. A descriptive survey design was adopted in the study while the sample was 380 of SS2 students (163 urban students and 217 rural students) fixed using Fluid Survey Sample Size Calculator. The major instrument for data collection was a 20-item structured questionnaire titled: Influence of Emotional Intelligence on Mathematics Achievement of Students (IEIMAS). The result of a reliability conducted with the Pearson's Product Moment Correlation analysis yielded an index of 0.85. Means and standard deviations were used to answer the research questions, while z-test analysis was used to test the hypotheses at the 0.05 level of significance. The results of the study showed that emotional intelligence (self-awareness, self-regulation, motivation, empathy, and social skills) influenced Mathematics achievement of students of public secondary schools in Rivers State to a high extent. Based on the findings, it was recommended that school counsellors should educate urban and rural students on the negative and positive influence of emotional intelligence on their academic performance. The attributes of emotional intelligence should be taken into consideration during planning of educational curriculum so as to enrich the current Mathematics curriculum and enhance students' performance in the subject. It was also suggested that the curriculum planners and researchers in the field of education should make use of this study in their areas of endeavour to stimulate new interest and areas for further research, which could bring about new developments.*

Key words: Academic achievement, emotional intelligence, influence, Mathematics, motivation, self-awareness.

INTRODUCTION
Mathematics occupies a crucial and unique role in human society and represents a strategic key in development. Drawing from the words of Einstein (1920), the ability to compute in

relation to the power of technology and geometrical understanding of space and time, that is, the physical world and its natural patterns show the cultural role of Mathematics in the history of civilization and in the future development of the society. Modern society today depends on the techniques and methods of geometry to build, navigate, design and to calculate the vase distance of outer space. Mathematics, as a body of knowledge, is centred on quantity, structure, space and changes. It is a science that deals with logic and logic is a holistic study of reasoning out of creative and critical thinking in order to draw a conclusion.

Mathematics is a bed rock and indispensable tool for scientific technological and economic advancement of nations. It works as a tool to understand many other subjects and languages. In a broad sense, it is taught to motivate the masses for advancement in science and technology; substances ranging from hydrogen bomb to compact discs would not have been possible without the knowledge of Mathematics (Grabowski, 2007).

There is so much emphasis on the need for students to study Mathematics and master it, but students are rarely aware of the usefulness of studying the subject. This perhaps explains why most students show little interest in the subject just because they need to pass it in their examination. One usefulness of Mathematics is that it prepares students for all round success in life; both in academics as well as employment opportunities. According to Grouws and Cebulla (2000), Mathematics develops students' ability in their lifelong learning skills which include little things like the ability to concentrate in order to study, focusing on tasks, being organized and the ability to stay organized. The study of Mathematics also enables students to develop their work ethics; instead of making up excuses, being lazy and blaming others.

Mathematics is one of the fields of study in the history of mankind that has one of the most central components of human concept. It has been believed for centuries that Mathematics sharpens the human brain, develops logical thinking, and enhances reasoning capacity and spatial power. It also influences an individual's personal development and contributes to the wealth of the nation. This is mainly because it is at the heart of many successful careers, successful achievement of the economy of a country and successful lives of individuals. Mastery in mathematical skills makes individuals to be confident even as they develop self-esteem in their ability to solve real time problems. It quickens students' minds, generates practicality which can be applied in day to day activities (Uwameh, 2011). Cockcroft (1982) outlined that it is essential that every learner should study Mathematics at school as it is one of the core subjects in all schools worldwide as expressed by the amount of time devoted to it in schools. In many countries of the world, Mathematics is made compulsory in primary and secondary levels of education. A major reason for the persistence of the special place held by Mathematics in school curriculum is the way in which it has been used in the last two centuries as a screening device, or filter for entry into numerous professions (Howson & Wilson, 1986). The competence gained in the study of Mathematics is widely used in all parts of human life. It is a key role in shaping how individuals deal with the various spheres of private, social and civil life (Anthony & Walshaw, 2009).

In spite of the significant roles Mathematics plays, it is regrettable that many students in contemporary times struggle with Mathematics and perform abysmally low in their examinations. In Nigeria, students' performance lately in Mathematics at School Certificate Examinations conducted by the West African Examinations Council (WAEC) and

National Examinations Commission (NECO) has not been encouraging (Uwameh, 2011). Candidates are reported to exhibit poor understanding of mathematical concepts and are unable to form the appropriate mathematical models which could be tackled with the requisite skills.

It has been realized that many students have developed negative attitude towards the study of Mathematics as a result of mass failure of students on the subject (Ojo, 1986). Mathematics is considered as part and parcel of human thought and logic, and integral to attempts at understanding the world. When it is poorly taught by unqualified and non-professional teachers, it ultimately results in poor performance by students. Several factors such as learner's interest, lack of qualified teachers, improper curricula and environment have been suggested to be responsible for the poor achievement in Mathematics by students (Uwameh, 2011). Most of the Mathematics teachers do not make the teaching of the subject practical and exciting as they do not have competencies to teach Mathematics dynamically which leads to negative attitudes amongst students thereby resulting in poor performance in the subject (Sa'ad, Adamu & Sadiq 2014). Most students at various levels of education find Mathematics as a difficult and boring subject, and develop feelings of inferiority, hesitation, and complex. Some have outright fear when they are faced with mathematical problems. Such situations directly hinder students' learning progress and increase their frustration thereby causing poor performance in Mathematics. Disappointment in Mathematics achievement is highly seen among students as they no longer want to involve their mental acuity to compute as calculators are widely available.

There are many factors that influence students' academic achievement. These include: emotional intelligence, attitude, creativity, memory, learner's age, study habit, social background, interest, anxiety, frustration, tension, among others (Maree, 2002). Emotional intelligence, according to Peter and John (1989), is the ability to monitor one's own and other people's emotions, to discriminate between different emotions, and label them appropriately and to use emotional information to guide thinking and behaviour. Emotional intelligence also reflects abilities to use intelligence, empathy and emotions to enhance thought and understanding of interpersonal dynamics. A student who is more responsive emotionally to crucial issues will attend to the more crucial issues of his life. When students are challenged to think and reason about Mathematics and interact with others, orally or in writing, they learn to be clear and convincing (National Council of Teachers of Mathematics, 2000).

Emotional intelligence can be linked to student's academic achievement at school. It is generally agreed that emotional stressors can prevent a student from reaching his full academic potential and that emotional and social skills can be taught through practical and therapeutic interventions (Peter & John 1989). Therefore, if adequate attention is given to a learner's emotions in the classroom, it can enhance his personal growth and academic achievement. Students whose emotional needs are met and dealt with at home are better able to cope with the academic demands in school (Uwazuruike, 2010). These students tend to have fewer behavioural problems and do better in languages and Mathematics than their peers with the same cognitive abilities but who are emotionally neglected (Goleman, 1995).

There is a framework of five attributes that define emotional intelligence: se1f-awareness, self-regulation, motivation, empathy, and social skills. Self-awareness is the capacity to examine one's own thoughts and feelings, to recognize oneself as an individual

separate from the environment and other individuals. When learners have high self-awareness, they understand their emotions, drives, personalities and habits, and do not let their feelings rule them. They know their strengths and weaknesses, and they work on their weaknesses so they can perform better. Learners with low self-awareness are often in hiding, not open to others, feeling cheated and always in doubt. They belittle themselves; make excuses, feeling awkward, incompetent and bad about themselves (Ferris, 2012). Self-awareness informs one of the interests to identify one's feelings and how these affect academic performance. It is the key to alert students about their strengths and weaknesses. By possessing self-awareness, that is being able to know one's capability makes such student to have self-confidence. Johnson (2009) stated that emotional health is a fundamental part of effective learning. The most critical factor of a student's success in academics is to have an understanding of oneself. Students who possess good self-awareness and innate impulse, performance high in Mathematics, while those who do not have good self-awareness and innate stimulus, tend to perform poorly in Mathematics.

Self-regulation is the ability to control one's emotions and impulses. It involves expressing one's emotions appropriately. Students that self-regulate typically do not allow themselves to become too angry or jealous, and they do not make impulsive, careless decisions (Goleman, 1995). They think before they act and stay calm under pressure. Those that lack self-regulation cannot manage their emotions and impulses appropriately. They are easily disappointed and frustrated, lack self-confidence and have trouble handling stress. In academic achievement, lack of self-regulation makes a learner to slack off before a test. From the classroom perspective, self-regulation on cognitive behaviour is an essential aspect of learning and good academic performance (Corno & Mandinach, 1983). When students are able to control their emotions, they are able to achieve high in academic goals (Dweck, Chiu, & Hong 1995). According to Mishra (2012), students who could control the impulses of their actions are able to achieve good academic success in Mathematics and other school subjects.

Motivation is one's direction to behaviour; it is what causes a person to move to repeat a behaviour, a set of forces that acts behind the motives. Highly motivated students are willing to defer immediate results for a long-term success; they are highly productive, effective and love challenges. They persist longer after encountering difficulties in a task, and strive hard for success when they perceive some risks of not succeeding. Those with low motivation lack faith in their abilities, they are afraid of failure and uncertainty, and lack interest in a given task. They are characterized with procrastination, laziness and nervousness (Goleman, 1995). Motivation as an emotional intelligence variable is very important in encouraging students to actively engage in the activities of teaching and learning. It encourages and creates fun learning process for students. When students are motivated, they become interested in studies, understand their learning goals and objectives for attaining good academic performance (Carroll, 1991). Highly motivated students usually perform better academically than those students who experience low motivation.

Empathy is the ability of an individual to identify with and understand the wants, needs, and viewpoints of those within the environment. Empathetic students avoid stereotyping and judging too quickly. They live their lives in an open and honest way. Highly empathetic students are more likely to engage in pro-social behaviours that benefit other people. Altruism and heroism are also connected to having empathy for others.

Students with low empathy respond to other people's feelings and emotions with indifference, selfish and uncaring attitude (Carmeli, 2003). Empathy is the ability of an individual to show concern for the needs of their colleagues. Cooper (2010) stated that empathy is the most powerful aspect for the development of learning relationships and achievement of gifted students. It is usually communicated non-verbally through facial expressions and body language. Students empathizing with their fellow students who understand non-verbal signs such as voice intonation, facial expression and so forth make great impact on such students' academic performance. Chow (2006) concluded that students' high level of empathy has positive relationship with their academic motivation thus helping to increase their academic performance. While students with low level of empathy show negative relationship in academic motivation and relent in their academic performance.

Social skill is any competence facilitating interaction and communication with others where social rules and relations are created and communicated, and changed in verbal and non-verbal ways (Gillis & Butler, 2007). Students with social intelligence skills can sense how others feel, know intuitively what to say in social situations and seem self-assured, even in larger crowd. They display core traits that help them communicate, lead and connect with others. Some important social skills include active listening, verbal communication skills, non-verbal communication skills and persuasiveness. Low social skill students are indecisive and; unpersuasive. They lack self-confidence and leadership quality. Low academic performance can be linked to social problems and emotions encountered by students, especially about the ability to use social skills to get support from teachers (MacMullin, 1994). As the social environment in which learning occurs can strengthen or eliminate behaviours that lead to academic achievement, the acquisition of social skills is very important to attain excellence in learning. Students who have not gained mastery of the social skills relationship with their peers and those who often behave badly in relationship with others eventually perform poorly in academics (Chow, 2006). Johnson (2009) proposed that social skills as emotional intelligence attribute enable students to develop good relationship and to possess social support which in-turn helps them to perform excellently in Mathematics and other school subjects.

Statement of the Problem

The poor academic achievement of secondary school students in science generally and Mathematics in particular is increasingly disturbing and has generated the concern of the general public in Nigeria. The poor achievement of students in Mathematics in spite of the efforts of the government in providing secondary schools with basic Mathematics textbooks, recruiting graduate Mathematics teachers, organizing seminars, and retraining programmes for teachers has been a course of concern to teachers, schools, administrators, educational planners, counsellors, researchers and policy makers.

Despite all these cost-intensive efforts in the area of Mathematics, it has been noted that students still exhibit negative emotions towards Mathematics and as a result they perform low academically in Mathematics. Other factors such as students' study habit, learners' attitude and motivation, socio-economic status of students, self-concept and self-esteem, creativity and retentive memory as they influence students' academic achievement have been identified and investigated yet students' performance is still low which

necessitated the need to investigate the influence of emotional intelligence on students' academic achievement in Mathematics.

Purpose of the Study
The purpose of this study is to investigate the influence of emotional intelligence on Mathematics achievement of students of public senior secondary schools in Rivers State. Specifically, the objectives of the study are to:
1.   Determine the influence of self-awareness on students' achievement in Mathematics in public senior secondary schools in Rivers State.

2.   Evaluate the extent to which self-regulation influences students' achievement in Mathematics in public senior secondary schools in Rivers State.

3.   Ascertain the extent to which motivation influences students' achievement in Mathematics in public senior secondary schools in Rivers State.

4.   Determine the extent to which empathy influences and students' achievement in Mathematics in public senior secondary schools in Rivers State.

5.   Investigate the extent to which social skills influence students' achievement in Mathematics in public senior secondary schools in Rivers State.

Research Questions
The following research questions have been put forward and guided the study:

1.   To what extent does self-awareness influence students' achievement in Mathematics in public senior secondary schools in Rivers State?

2.   What is the extent to which self-regulation influences students' achievement in Mathematics in public senior secondary schools in Rivers State?

3.   To what extent does motivation influence students' achievement in Mathematics in public senior secondary schools in Rivers State?

4.   To what extent does empathy influence students' achievement in Mathematics in public senior secondary schools in Rivers State?

5.   To what extent do social skills influence students' achievement in Mathematics in public senior secondary schools in Rivers State?

Hypotheses
The following null hypotheses will guide the study:

1.   There is no significant difference in the mean rating of urban and rural students that self-awareness influences students' achievement in Mathematics in public senior secondary schools in Rivers State.

2.   There is no significant difference in the mean rating of urban and rural students that self-regulation influences students' achievement in Mathematics in public senior secondary schools in Rivers State.

3. There is no significant difference in the mean rating of urban and rural students that motivation influences students' achievement in Mathematics in public senior secondary schools in Rivers State.

4. There is no significant difference in the mean rating of urban and rural students that empathy influences students' achievement in Mathematics in public senior secondary schools in Rivers State.

5. There is no significant difference in the mean rating of urban and rural students that social skills influence students' achievement in Mathematics in public senior secondary schools in Rivers State.

METHODOLOGY
The study adopted the descriptive survey design. The population of the study consisted of all the 34168 senior secondary two (SS2) students of the 268 public senior secondary schools in the 23 Local Government Areas Rivers State in the 2018/2019 academic session (Planning Research and Statistics Department, Rivers State Senior Secondary School Board). The sample of 380 students of urban (163 students) and rural (217 students) schools was determined using Fluid Survey Sample Size Calculator. The instrument used for data collection was a 20-item structured questionnaire titled: Influence of Emotional Intelligence on Mathematics Achievement of Students (IEIMAS). A reliability test conducted using the Pearson's Product Moment Correlation analysis yielded a reliability index of 0.85. While means and standard deviations were used to answer the research questions, the hypotheses of the study were tested using the z-test statistic at 5% level of significance.

RESULTS
Research Question 1: To what extent does self-awareness influence students' achievement in Mathematics in public secondary schools in Rivers State?

Table 1: Descriptive Statistics on the Extent Self-awareness Influences Students' Achievement in Mathematics in Urban and Rural Public Secondary Schools in Rivers State

S/No.	Items	Urban School Students (163)			Rural School Students (217)		
		$\bar{\text{x}}$	SD	Decision	$\bar{\text{x}}$	SD	Decision
1	I understand my emotions and it does not rule my performance in Mathematics.	2.99	1.03	High Extent	2.80	1.11	High Extent
2	Am always bold, never in doubt while studying Mathematics.	3.01	1.09	High Extent	3.02	0.98	High Extent
3	I am competent in understanding mathematical concepts.	2.71	1.11	High Extent	3.11	1.04	High Extent
4	I have confidence to succeed in studying and solving Mathematics.	3.35	1.07	High Extent	3.16	1.08	Low Extent
	Grand Mean and Decision	**3.02**	**1.08**	**High Extent**	**3.02**	**1.05**	**High Extent**

The information in Table 1 shows that students in urban schools have a grand mean of 3.02 and standard deviation of 1.08, while students in rural schools have a grand mean of 3.02 and standard deviation of 1.05, indicating high extent influence of self-awareness on students' academic achievement. This denotes that students of urban and rural public secondary schools in Rivers State are in a consensus that self-awareness influences students' academic achievement in Mathematics to a high extent.

Research Question 2: What is the extent to which self-regulation influences urban and rural students' achievement in Mathematics?

Table 2: Descriptive Statistics on the Extent Self-regulation Influences Students' Achievement in Mathematics in Urban and Rural Public Secondary Schools in Rivers State

S/No.	Items	Urban School Students (163)			Rural School Students (217)		
		$\bar{x}$	SD	Decision	$\bar{x}$	SD	Decision
5	I have the ability to compute and calculate in relation to quantity.	3.29	0.87	High Extent	2.59	1.09	High Extent
6	I self- regulate and avoid stress during Mathematics classes.	3.21	1.02	High Extent	2.79	1.01	High Extent
7	I do not slack off before a test in Mathematics.	3.28	0.86	High Extent	3.31	0.94	High Extent
8	I achieve good academic success in Mathematics.	3.14	1.23	High Extent	3.41	0.78	High Extent
	Grand Mean and Decision	**3.23**	**0.99**	**High Extent**	**3.03**	**0.96**	**High Extent**

Table 2 presents that students in urban schools have grand mean of 3.23 and standard deviation of 0.99, while students in rural schools have grand mean of 3.03 and standard deviation of 0.96, indicating high extent influence of self-regulation on students' achievement in Mathematics. This implies that students of urban and rural public secondary schools in Rivers State are in accord that self-regulation influences, to a high extent, students' achievement in Mathematics.

Research question 3: To what extent does motivation influence urban and rural students' academic achievement in Mathematics?

Table 3: Descriptive Statistics on the Extent Motivation Influences Students' Achievement in Mathematics in Urban and Rural Public Secondary Schools in Rivers State

S/No.	Items	Urban School Students (163)			Rural School Students (217)		
		$\bar{x}$	SD	Decision	$\bar{x}$	SD	Decision
9	I persist longer after encountering difficulties in calculations.	3.23	0.87	High Extent	3.05	1.11	High Extent
10	I am willing to defer immediate results for a long-term success in Mathematics.	2.96	1.04	High Extent	2.54	1.04	High Extent

11	I clearly articulate what I want to achieve in a Mathematics class.	2.84	0.97	High Extent	2.75	1.06	High Extent
12	I have strong belief in my ability to accomplish learning task in Maths.	3.19	1.04	High Extent	2.37	1.09	Low Extent
Grand Mean and Decision		**3.31**	**0.98**	**High Extent**	**2.68**	**1.08**	**High Extent**

The information in Table 3 reveals that students in urban schools have a grand mean of 3.31 and standard deviation of 0.98, while students in rural schools have a grand mean of 2.68 and standard deviation of 1.08, which points out that motivation influences students' achievement in Mathematics to a high extent. In other words, students of urban and rural public secondary schools in Rivers State are in agreement that motivation influences students' achievement in Mathematics to a high extent.

Research question 4: To what extent does empathy influence urban and rural students' academic achievement in Mathematics?

Table 4: Descriptive Statistics on the Extent Empathy Influences Students' Achievement in Mathematics in Urban and Rural Public Secondary Schools in Rivers State

S/No.	Items	Urban School Students (163)			Rural School Students (217)		
		$\bar{x}$	SD	Decision	$\bar{x}$	SD	Decision
13	I respond to others' feelings and solve their mathematical problems.	3.26	1.01	High Extent	2.99	1.04	High Extent
14	I am peaceful, productive and positive towards computations.	3.16	0.86	High Extent	3.39	0.91	High Extent
15	I study Mathematics in cooperative and collaborative learning environment.	3.22	0.90	High Extent	2.82	1.01	High Extent
16	Empathetic understanding influences my performance in Mathematics.	2.99	1.02	High Extent	2.85	1.14	High Extent
	Grand Mean and Decision	**3.16**	**0.94**	**High Extent**	**3.01**	**1.03**	**High Extent**

Table 4 illustrates that students in urban schools have grand mean of 3.16 and standard deviation of 0.94, while students in rural schools have grand mean of 3.01 and standard deviation of 1.03, which informs that empathy has a high extent influence on students' achievement in Mathematics. This signifies that students of urban and rural public secondary schools in Rivers State consent that empathy influences, to a high extent, students' achievement in Mathematics.

Research question 5: To what extent do social skills influence urban and rural students' academic achievement in Mathematics?

Table 5: Descriptive Statistics on the Extent Social Skills Influence Students' Achievement in Mathematics in Urban and Rural Public Secondary Schools in Rivers State**.**

S/No.	Items	Urban School Students (163)			Rural School Students (217)		
		$\bar{\text{x}}$	SD	Decision	$\bar{\text{x}}$	SD	Decision
17	I can sense and intuitively know how to sort a mathematical concept.	2.54	0.93	High Extent	2.96	1.14	High Extent
18	I can communicate, lead and connect others during Mathematics classes.	2.83	0.97	High Extent	2.22	1.20	High Extent
19	Social skills enable me to develop good relationship and perform excellently in Mathematics.	3.23	0.99	High Extent	2.63	1.09	High Extent
20	Social skills enhance my ability to listen, communicate and solve mathematical problems.	3.15	0.84	High Extent	2.81	1.05	High Extent
	Grand Mean and Decision	**2.94**	**0.93**	**High Extent**	**2.81**	**1.05**	**High Extent**

Table 5 reveals that students in urban schools have grand mean of 2.94 and standard deviation of 0.93, while students in rural schools have grand mean of 2.81 and standard deviation of 1.05, which attests that social skills influence, to a high extent, students' achievement in Mathematics. This evinces that students of urban and rural public secondary schools in Rivers State are in harmony that social skills influence students' achievement in Mathematics to a high extent.

Hypothesis 1: There is no significant difference between the urban and rural students in the mean rating that self-awareness influences students' academic achievement in Mathematics.

Table 6: z-test Analysis of the Influence of Self-awareness on Urban and Rural Students' Academic Achievement in Mathematics.

Variables	N	Mean	SD	df	A	Cal.(z)	Crit.(z)	Decision
Urban	217	3.02	1.08					Ho Not Rejected
				379	0.05	0.03	1.96	
Rural	163	3.02	1.05					

Table 6 displays z-test analysis of influence of self-awareness on students' achievement in Mathematics with calculated z [cal.(z)] = 0.03, α = 0.05, degrees of freedom (df) = 379 and critical z [crit.(z)] = 1.96. Thus, with cal.(z) = 0.03 < crit.(z) = 1.96, the null hypothesis that "there is no significant difference between the urban and rural students in the mean rating that self-awareness influences students' academic achievement in Mathematics in public secondary schools in Rivers State" is not rejected. In other words, students in urban and rural public secondary schools in Rivers State are in accord that self-awareness positively

influences, to a high extent, the Mathematics achievement of students of public secondary schools in Rivers State.

Hypothesis 2: There is no significant difference between the urban and rural students in the mean rating that self-regulation influences students' academic achievement in Mathematics.

Table 7: z-test Analysis of the Influence of Self-regulation on Urban and Rural Students' Academic Achievement in Mathematics.

Variables	N	Mean	SD	df	P	Cal.(z)	Crit.(z)	Decision
Urban	217	3.23	0.99					
				379	0.05	0.06	1.96	Ho Not Rejected
Rural	163	3.03	0.96					

The information in Table 7 illustrates the z-test analysis of influence of self-regulation on students' achievement in Mathematics with calculated z [cal.(z)] = 0.06, α = 0.05, degrees of freedom (df) = 379 and critical z [crit.(z)] = 1.96. Thus, with cal.(z) = 0.06 < crit.(z) = 1.96, the null hypothesis that "there is no significant difference between the urban and rural students in the mean rating that self-regulation influences students' academic achievement in Mathematics in public secondary schools in Rivers State" is not rejected. This evinces that students of urban and rural public secondary schools in Rivers State are in harmony that self-regulation influences, to a high extent, students' achievement in Mathematics in public secondary schools in Rivers State.

Hypothesis 3: There is no significant difference between the urban and rural students in the mean rating that motivation influences students' academic achievement in Mathematics.

Table 8: z-test Analysis of Influence of Motivation on Urban and Rural Students' Academic Achievement in Mathematics.

Variables	N	Mean	SD	df	P	Cal.(z)	Crit.(z)	Decision
Urban	217	3.31	0.98					
				379	0.05	0.27	1.96	Ho Not Rejected
Rural	163	2.68	1.08					

Table 8 presents the z-test analysis of influence of motivation on students' achievement in Mathematics with calculated z [cal.(z)] = 0.27, α = 0.05, degrees of freedom (df) = 379 and critical z [crit.(z)] = 1.96. Thus, with cal.(z) = 0.27 < crit.(z) = 1.96, the null hypothesis that "there is no significant difference between the urban and rural students in the mean rating that motivation influences students' academic achievement in Mathematics in public secondary schools in Rivers State" is not rejected. This implies that students of urban and rural public secondary schools in Rivers State are in agreement that motivation influences students' achievement in Mathematics in public secondary schools in Rivers State to a high extent.

Hypothesis 4: There is no significant difference between the urban and rural students in the mean rating that empathy influences students' academic achievement in Mathematics.

Table 9: z-test Analysis of Empathy on Urban and Rural Students' Academic Achievement in Mathematics.

Variables	N	Mean	SD	df	P	Cal.(z)	Crit.(z)	Decision
Urban	217	3.16	0.95					
				379	0.05	0.05	1.96	Ho Not Rejected
Rural	163	3.01	1.03					

The information in Table 9 shows the z-test analysis of influence of empathy on students' achievement in Mathematics with calculated z [cal.(z)] = 0.05, α = 0.05, degrees of freedom (df) = 379 and critical z [crit.(z)] = 1.96. Thus, with cal.(z) = 0.05 < crit.(z) = 1.96, the null hypothesis that "there is no significant difference between the urban and rural students in the mean rating that empathy influences students' academic achievement in Mathematics in public secondary schools in Rivers State" is not rejected. This denotes that students of urban and rural public secondary schools in Rivers State are in accord that empathy influences, to a high extent, students' achievement in Mathematics in public secondary schools in Rivers State.

Hypothesis 5: There is no significant difference between the urban and rural students in the mean rating that social skills influence students' academic achievement in Mathematics.

Table 10: z-test Analysis of Social Skills on Urban and Rural Students' Academic Achievement in Mathematics.

Variables	N	Mean	SD	df	P	Cal.(z)	Crit.(z)	Decision
Urban	217	2.94	0.93					
				379	0.05	0.04	1.96	Ho Not Rejected
Rural	163	2.81	1.05					

Table 10 displays the z-test analysis of influence of social skills on students' achievement in Mathematics with calculated z [cal.(z)] = 0.04, α = 0.05, degrees of freedom (df) = 379 and critical z [crit.(z)] = 1.96. Thus, with cal.(z) = 0.04 < crit.(z) = 1.96, the null hypothesis that "there is no significant difference between the urban and rural students in the mean rating that social skills influence students' academic achievement in Mathematics in public secondary schools in Rivers State" is not rejected. This evinces that students of urban and rural public secondary schools in Rivers State are in a consensus that social skills influence, to a high extent, students' achievement in Mathematics in public secondary schools in Rivers State.

DISCUSSION OF FINDINGS
The study investigated the influence of emotional intelligence on Mathematics achievement of students of public senior secondary schools in Rivers State and found that self-

awareness, self-regulation, motivation, empathy and social skills influence students' Mathematics achievement to a high extent.

Self-awareness, an attribute of emotional intelligence, was found to influence students' achievement in Mathematics to a high extent. Self-awareness was found as the key to alert students about their strengths and weaknesses; and being able to know one's capability makes one to have self-confidence which enhances academic performance. Supporting this result, Johnson (2009) stated that the most critical factor of a student's success in academics generally and Mathematics in particular is the possession of good self-awareness and innate impulse. He added that those who do not have good self-awareness and innate stimulus, tend to perform poorly in Mathematics. Learners with low self-awareness are often in hiding, not open to others, feeling cheated and always in doubt. They belittle themselves, make excuses, feeling awkward, incompetent and bad about themselves (Ferris, 2012) leading to poor Mathematics achievement.

The extent of influence of self-regulation, as a component of emotional intelligence, was found to be high on Mathematics achievement of students of public secondary schools in Rivers State. According to Mishra (2012), students who could control the impulses of their actions are able to achieve good academic success in Mathematics as other school subjects. Also in line with the result of this study, Goleman (1995) found that students that self-regulate typically do not allow themselves to become too angry or jealous, and they do not make impulsive and careless decisions because they think before they act and stay calm under pressure which enhance their general academic achievement.

It was found out that motivation influences urban and rural students' academic achievement in Mathematics to a high extent and that highly motivated students are willing to defer immediate results for a long-term success; they are highly productive, effective and love challenges; they persist longer after encountering difficulties in a task; and strive hard for success when they perceive some risks of not succeeding. This is in line with the findings of (Carroll, 1991) which noted that when students are motivated, they become interested in studies, understand their learning goals and objectives for attaining good academic performance, and persevere in the face of challenges; while those with low motivation lack faith in their abilities, are afraid of failure and uncertainty, lack interest in a given tasks, and are characterized with procrastination, laziness and nervousness (Goleman, 1995).

Empathy was found to influence students' academic achievement in Mathematics to a high extent, emphasising that empathy enables students to identify with and understand the wants, needs, and viewpoints of those within their environment. Empathetic students are open and honest, avoid stereotyping and do not judge others too quickly. In consensus with this result, Chow (2006) reported that students' high level of empathy has positive relationship with their academic motivation thus helping to increase their academic performance. Students with low empathy respond to other people's feelings and emotions with indifference, selfish and uncaring attitude (Carmeli, 2003). Cooper (2010) stated that empathy is the most powerful aspect for the development of learning relationships and achievement of gifted students.

The study further found that social skills influence, to a high extent, urban and rural students' Mathematics achievement in public secondary schools in Rivers State. This is in agreement with the result of Johnson (2009) that social skills enable students to develop good relationship and to possess social support which in-turn helps them to perform

excellently in Mathematics and other school subjects. Low academic performance can be linked to social problems and emotions encountered by students, especially about the ability to use social skills to get support from teachers (MacMullin, 1994). Social skills facilitate interaction and communication with others leading to high academic achievement, while lack of it often makes students behave badly in relationship with others eventually causing poor perform in academics (Chow, 2006).

CONCLUSION
The results of this study have shown that emotional intelligence (self-awareness, self-regulation, motivation, empathy, and social skills) influences students' achievement in Mathematics to a high extent in public secondary schools in Rivers Sate. It is hoped that these findings will guide parents, teachers and counsellors in identifying areas of impediments in the learning of Mathematics in which today's society depends on to build, navigate, design and calculate the vase distance of outer space, and help man solve his technological problems.

RECOMMENDATIONS
In the light of the findings of this study, the following recommendations are made:
1.   School counsellors should be able to educate urban and rural students on the negative and positive influences of emotional intelligence on their academic performance.
2.   The attributes of emotional intelligence should be taken into consideration during planning of educational curriculum so as to enrich the current Mathematics curriculum and enhance students' performance in the subject.
3.   The curriculum planners and researchers in the field of education should make use of this study in their areas of endeavour to stimulate new interest and areas for further research, which could bring about new developments in the teaching and learning of Mathematics both in urban and rural areas.

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