

Influencing Factors of Senior High School Students' Performance in Mathematics in the Accra Metropolis of Ghana

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Abstract

The main purpose of this study is to investigate the influencing factors of senior high school students' performance in mathematics in the Accra metropolis of Ghana. A close-ended questionnaire was used to collect the data for our analysis. A total of 120 teachers were involved in the study of which 120 questionnaires were returned by them and used for further analysis. IBM SPSS version 25 software was used to analyze the survey data. The study found that a significant number of the students in senior high school in the Accra Metropolis performed better in mathematics. The study further found that teacher factors, school factors and home factors significantly influence students' academic performance in mathematics at the senior high school level. Findings of the study revealed that teacher, school and home factors significantly and positively influence students' performance in mathematics examination. However, the study found that there is a significant negative effect of home factors on students' academic performance in mathematics in the Accra metropolis.

Keywords: Academic Achievement, Influencing Factors, Mathematics, Accra, Ghana

1. INTRODUCTION

In the last few years, the government has made substantial improvements in the education system, notably at the elementary and secondary levels. Ghanaian education is divided into two levels: primary and secondary school. The value of knowledge production in the growth of a society in terms of importance of education has long been recognized. This explains why people and governments all over the world invest in education in different ways. Training is typically an expensive undertaking for both nations and individuals. As a consequence, stakeholders must be informed of the factors that influence the provision and efficiency of services for students (Abubakar, 2011).

In Ghana, the Senior High School (SHS) is the second level of education after primary school. At this point, most parents realize what their children can gain from it in terms of being useful people. Many subjects are offered at the secondary school level. There are a variety of core subjects that all students must take, regardless of the program they are enrolled in. The study of Mathematics is one of these main topics such as English Language, Social Studies and Integrated Science are the other core-topics. A student must pass the core subjects in order to progress to the next stage of tertiary education in Ghana (Angbing, 2014).

Mathematics is one of the most important topics in the world's educational system. The topic is thought to have a direct connection to other important disciplines, notably scientific and technical (Konstantopoulos & Hedges, 2008). Mathematics has an effect on every aspect of human life at different levels. Mathematics is regarded by society as the foundation of science and technological knowledge, which is critical to a country's social and economic development (Konstantopoulos & Borman, 2011). Mathematics has also been regarded as a compulsory subject in Ghana and the rest of the world as a course that spans elementary and secondary school. Eraikhuemen (2003) argued that a systematic and ordered pattern of life can only be accomplished through the philosophy of mathematics because of the vast aspects of mathematics. Unfortunately, students' achievement in this important subject has not been promoted in Ghana at the primary, secondary, or tertiary education levels over the decades. Mathematics is a challenging subject for students, parents, and teachers to master (Sa'ad, Adamu, & Sadiq, 2014). According to Unameh (2011), mathematics is the cornerstone and unbreakable foundation for any nation's science, technical, and economic progress. He went on to claim that mathematics is inextricably related to everyday life and everyone's long-term planning. As a consequence, mathematics is a topic without which education and human life will be unsuccessful. In Ghana, mathematics is

given the attention it deserves in the curriculum and in all educational policies, from primary to higher education. Further research reveals that mathematics is valued not only for obtaining academic qualifications, but also for preparing students to solve problems in the real world, especially in the workplace (Davies & Hersh, 2012).

Mathematics is among the central or fundamental subjects for both primary and secondary school students, according to the Ghana Education Service. Furthermore, mathematics is one of the mandatory subjects that students must pass at a credit level before being admitted to any tertiary institution in Ghana. Passing mathematics, which is one of the foundations of Ghana's education, has become a difficult task, to the point that perhaps the pass rate for Ghanaian students has not been promising, with just marginally more than half of the students passing. And in the 50%, not all students receive an excellent grade, and in the worst-case scenario, they receive a poor grade. The question is, how can Ghana's mathematics math proficiency be improved? Many education providers, such as instructors, trainers, and researchers, have recently expressed an interest in investigating variables that relate to the quality of learners' mathematics results. These factors can occur both within and outside of the classroom and have an effect on students' academic performance. Student factors, family factors, school factors, and peer factors are examples of these factors (Crosnoe, Johnson & Elder, 2004).

It's disturbing because studies and data from various examination bodies such as the West African Examination Council (WAEC) have consistently shown low performance in general mathematics in Ghana's May/June West Africa Senior Secondary School Certificate Examination (WASSCE) and Basic Education Certificate Examination. As a consequence, it is an undeniable fact that the success of studying mathematics is based on a number of variables. Surprisingly, considering the immense attention provided to discovering these factors by many researchers in their different countries and cultures, researchers have placed little or no effort into identifying (from the perspective of pupils) those factors that are so peculiar to students affect mathematics learning or performance at primary schools. This is consequential upon the fact that without a credit pass in mathematics, students will not be able to proceed to higher educational institutions where highly skilled workforce in Science, Technology, and Engineering needed for today's global economy are produced (Considene & Zapala, 2002; Mbugua, Kibet, Muthaa & Nkonke, 2012). How can the key stakeholders in the education service of Ghana been able to remedy the situation? (Akunga & Attfeild, 2010; Elias, Awang, & Mohamed, 2005; Taghavinia & Motavassel, 2015). It is therefore an irrefutable fact that the successfulness of learning the subject is contingent on myriad of factors (Carlson & Cowen, 2015; Booher-Jennings 2005; Dee & Jacob 2011; Quintano et al., 2009; Jennings & Sohn 2014). School, students and teacher factors all impinge on the learning of mathematics (Pridmore & Jere, 2011; Naamara, Nabasumba & Nabadda, 2017). It is against this backdrop that the study seeks to analysis some factors affecting student's mathematics performance in senior high schools in Ghana. In responding to some of these challenges of mathematics education in Ghana, the study sought to investigate the determinants of students' mathematics pass rate in Ghana and the practical measures to be taken to curb the situation of low pass rate in mathematics examination.

1.1. Research Questions

The main purpose of the study is to investigate the influencing factors of students' academic performance in mathematics at the secondary school level in Ghana. The study at the end will answer the following questions:

- i. What is the academic performance of secondary school students in mathematics in Ghana?
- ii. What are the main influencing factors of students' performance in mathematics among public basic level school students in Ghana?
- iii. How does influencing factors such as (Teacher-factors, school-factors and Home factors) affect students' academic performance in Mathematics in Ghana?

1.2. Research Model

Based on an extensive review of literature, a conceptual model was designed for the study. This conceptual model sought to establish how the influencing factor of students determines their pass rates in Mathematics in Ghana. This was illustrated in Figure 1.

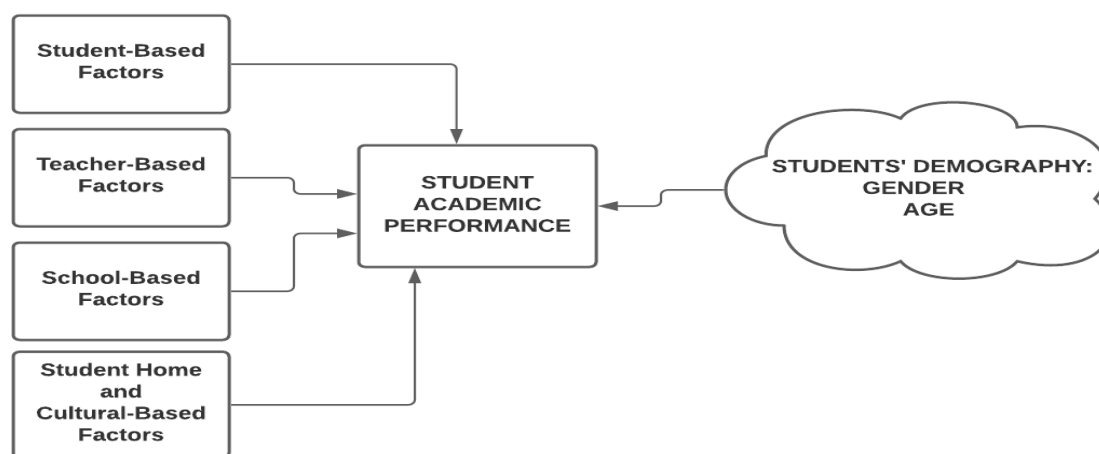


Figure1: Conceptual Model of the Study

1.3. Significance of the study

The study at the end will be relevant in the following ways:

Firstly, the study will throw lights on the main causes and remedies to students pass rates in mathematics using both Ghana. The study will provide recommendations that would enable social representation of teachers and mathematics educators to become aware of ways they can boost school performance. This will give decision-makers and educational stakeholders what resources and measures to put in place to improve Ghana's Mathematics education. This will enable mathematics teachers to become aware of the role that they play in students failure rate in mathematics and also enable them to devise innovative and efficacious ways that they adopt as part of their teaching strategies in Class to boost academic performance. Secondly, students and parents will be well informed on some of the measures they have to take to also support themselves as students and parents to achieve positive results in mathematics education in Ghana. Finally, this study will add to the body of knowledge for future researchers and academic fraternity worldwide.

2. LITERATURE REVIEW

2.1. Influencing Factors of Students' Performance

2.1.1. Teacher-Factors on Students' Academic Achievement in Mathematics

Mathematical abilities have often been recognized as important not just for academic achievement as well as for successful daily functioning (Carey, Hill, Devine & Sz "ucs, 2017). We develop precision, continuity, and personal discipline by studying mathematics, which are important skills for successful and conscientious decision making and problem solving in everyday life. The performance of students in mathematics from primary school to higher education is indeed a source of concern (Wahid, Yusof, & Razak, 2014), owing to global understanding of the value of mathematical ability on the one hand, and concern raised for many decades at different levels of education about underachievement in mathematics (Eng, T.H.; Li, V.L.; Julaihi, N.H, 2010).

Teachers' influence on students' success in school, throughout all subjects, cannot be overstated. Sanders (2000) claimed in a report that "disparities in teacher effectiveness are the greatest single factor influencing academic development of the student body" p8. According to Betts, Zau, and Rice (2003), the teacher as well as the many aspects of their education, such as years of teaching experience, professional teacher certifications and subject authorizations, highest academic degree, and college field(s) of study, are arguably the most valuable school resource. Gender and teacher academic credentials are the teacher-related determinants to be explored in this article.

One element implicated in the development in educational outcomes in schools tends to be the gender of teachers. Regrettably, the majority of research on the impact of gender on student success tend to be focused on

Mathematics and Science. Several studies have shown, however, that the belief that males perform better in virtually every area than females is rapidly being rethought (Eniayeju, 2010 and Abubakar 2011). Fitchett (2010) discovered that, as compared to teachers in other subject areas, teachers in the field of mathematics remained disproportionately male. He notes further that, past studies on gender within mathematics have stated clearly that the male orientation of the mathematics dissuades many young women from entering the area. According to Fitchett, it might not be appropriate to compare the effect of female gender on mathematics students' results when the male gender has a numerical advantage. So far, there has been no strong indication of the impact of gender on student performance in the debate. Furthermore, it appears that all research performed to assess gender effects on mathematics and science are inconclusive. As a result, stating that a specific item is defective might not be sufficient in secondary schools, gender has a greater effect on student achievement.

In Ghana, there is almost no data on the impact of gender on student success in the field of mathematics. The value of teachers is generally known, according to Arain (2011), because of their effect on students' success. He went on to claim that research has shown that improved teacher variables are the most likely to result in major changes in student results. Teachers' academic status is one of these teacher-related variables that could contribute to changes in students' success. Goldhaber and Brewer (2000) found that the form of credential had no effect on student achievement in a study to assess the impact of various teacher certification levels on student achievement teacher held was related to students' outcomes.

Students of teachers with standard certification in Mathematics, for example, performed better than students of teachers with either no certification or private school certification in Mathematics. In a separate review, Goe and Stickler (2008) confirmed the results of Frome, Lasater, and Cooney (2005), who found that completing a mathematics undergraduate or graduate major was linked to higher student achievement in high school and middle school. This does not apply to mathematics since it incorporates a variety of otherwise distinct subjects such as history, geography, economics, and government, among others, and so it may be difficult to provide a suitable curriculum to have adequate mastery in all these otherwise distinct subject areas. Furthermore, because there are private SHS in Ghana that employ relatively few workers, these results may not be definitive. Unqualified instructors in respect of certification, but their students do better than certain public SHS students with highly qualified (certification-wise) teachers in some instances. This suggests that, apart from qualification, there are other teacher-related variables that influence students' success in Ghana's SHS. There are several mathematic teachers in Ghana who are single social science/arts specialists. They typically have academic qualifications in history, economics, geography, political science, and other related fields studies on growth.

As a result, their approaches to teaching mathematics are still focused on how they teach history, geography, and economics. In the meantime, mathematics necessitates an integrated approach in which all of the different mathematics/arts topics that make up mathematics lose their distinct focus or identification. This would almost definitely have an effect on students' grades. It's worth remembering that the issue of non-specialist teachers teaching mathematics isn't unique to Ghana. According to Adeniyi (1982), at the time of the report, 81.3 percent of mathematics teachers randomly selected in secondary schools in the Ilorin Local Government Area of Ghana, State were professionally unqualified to teach mathematics. In a related research, Adinoyi (1986) discovered that in randomly selected secondary schools in Okene/Okehi Local Government Area of Kwara State, now Kogi State, Nigeria, 76 percent of mathematics teachers lacked teaching qualifications in mathematics.

2.1.2. School Based-Factors on Students' Academic Achievement in Mathematics

The teacher's workshop is the school and the classroom where he teaches students. As a result, if the school and classroom(s) where a mathematics teacher teaches are receptive to effective teaching and learning, the skills and expertise he or she brings to the classroom will have a greater effect on students. Research have indicated that school quality affects learners' results (Lai, Sadoulet & Janvry, 2009) but there is no rigorous evidence to back this up. According to Lai, Sadoulet, and Janvry (2009), teachers are primarily responsible for explaining students' results, leaving little room for other school resources or peer quality. As a result,

determining the effect of school quality on students' academic success has been extremely difficult in terms of assessment over the period of time. Asikhia (2010) revealed that the significance of the school's location and the appearance of its physical structures in determining for student achievement in classrooms cannot be overstated.

According to Asikhia (2010), the school's position will influence patronage and, to some degree, the caliber of students and teachers it attracts. It is common knowledge that students who succeed in Junior High School (JHS) would not be enticed to attend schools in remote areas with insufficient facilities. Indeed, schools such as those will most probably not attract highly qualified students and teachers. In a previous study, Betts, Zau, and Rice (2003) discovered that schools in less wealthy areas had less experienced, less trained teachers who were less likely to possess full academic qualifications, and these were the schools with the lowest test scores. Highly trained and experienced teachers are more likely to relocate to schools with attractive facilities and convenient locations. If this occurs, it is possible that unqualified teachers and students with low JHS grades will be required to attend schools that are bizarre and deficient in facilities. This would discourage teachers and students even more, resulting in low academic results. While teacher skills and expertise are not the only indicators of students' success, they do play a significant role in evaluating a student's level of performance in mathematics across schools, according to study.

The consistency and level of teacher motivation can have a direct effect on student success. Students' academic performance would suffer if a school had a large number of uncommitted teachers for some cause. The level of dedication and cordiality that exists between teachers and students, as well as between teachers and schools, is largely determined by the school plant. It would be difficult for teachers to offer their best effort if the school is run in such a way that they are unhappy, regardless of the location or nature of the school infrastructure. Students are the ultimate losers because teachers are no longer paid based on their students' grades, as was the case in Ghana in the 1930s and 1940s, when teachers were paid based on the percentage pass rate of students/pupils in schools. The classroom climate is another school aspect that may cause students to perform poorly. When a school is regarded as a good school due to its location, the quality of its teachers, and the appearance of its physical infrastructure, among other factors, enrolments tend to be very high. The learning environment can become poorly suited over time if it is not well handled, as there will be overcrowding in the classrooms. Porter (2002) discovered that when teaching was effectively linked to evaluation, students made academic progress. Teachers, on the other hand, stepped away from giving satisfactory assignments to students in broad classes due to the job load of labeling. It also has an effect on classroom management and discipline. Individualization of instruction is not possible for teachers. According to Nzabihimana (2010), teaching subjects that require a lot of attention, such as Math, is likely to be harmed by a high pupil-teacher ratio. When this occurs, students are not adequately evaluated, which has a negative impact on them in the long run. After exploring a few of the teacher and school-related variables as determinants of students' mathematics success in SHS, it will be worthwhile to investigate the degree to which some home factors also influence students' mathematics performance in SHS.

2.1.3. Home Based-Factors on Students' Academic Achievement in Mathematics

It is obvious that a student's home affects his or her academic success. A close analysis of the types of homes, as well as the family's Socio-Economic Status (SES), will show that there is a connection between the home and student success. According to Brecko (2010), one of the most important goals of education is to ensure that every student has the opportunity to succeed in school and in life. She went on to say that a child's academic success dictated their adult success, deciding whether or not they went to college, what career they chose, and how much they earned. Loop (2012) indicated that education is not the only aspect that influences a child's ability to learn and succeed in school. Loop (2012) went on to say that, while the learning environment is critical, each student's home situation has a significant impact on educational goals and success. As a result, a student's success in secondary and primary schools is not solely dictated by his or her mental and physical ability. Students' family and social backgrounds have a major impact on their academic success (Paul, 2012).

The child-parent relationship is a critical home element that affects the child's learning and achievement. Parents who are attentive to their children's needs may have an impact on their children's academic success. The

educational ambitions of parents have a huge effect on their children's progress. As a consequence, if all other variables are equivalent, parents who have goals that challenge, encourage, and empower their children should see a positive connection with their children's academic success. Students who come from homes where their parents are unresponsive to their physical and emotional needs become overwhelmed, and if the problem is not treated properly, it may lead to serious consequences and will go a long way to affect their performance. Students come from a variety of social backgrounds, which has a variety of impacts on them (Paul, 2012; Loop 2012).

According to Paul (2012), a student's achievement is inextricably linked to their education. Recent studies, on the other hand, suggest that parents are much more critical in terms of students' school success. According to Paul, recent studies have shown that parental participation in reviewing their children's homework, daily attendance at school meetings, and debating school events with their children has a greater effect on students' academic success than the school they attend. In Ghana, as in other nations, students from various family backgrounds attend educational institutions. These differences include, among other things, the parents' level of education, educational preferences, and financial support for their children. It is most likely that trained parents would be more willing to provide a successful education by meeting their children's needs. It should be noted, however, that some well-educated parents pay little attention to the education of their own children. If this situation continues, students whose parents are unconcerned about their children's education will fail in school. It should also be noted that there are cases where illiterate parents, considering their own illiteracy, give greater attention to their children's education. To such illiterate parents, they do not want their children to suffer the deprivations they had to endure. It may therefore be true that parents' level of education is a strong determinant of students' performance in school. A home that encourages learning is perhaps the most accurate predictor of success at school. Parents who are illiterate do not want their children to go through the struggles they did. As a result, it's likely that parents' educational achievement has a major effect on their children's academic success. A learning-friendly home is probably the most reliable indicator of academic achievement.

3. RESEARCH METHODOLOGY

3.1. Research Design

This study will use a descriptive survey by applying the quantitative research approach. This type of design will be used because it will allow the researcher to study a small sample and later generalized the findings to the whole population. Osuala, (2001) was of the view that in survey research small sample is studied and the findings generalized to the whole population. The descriptive survey design was deemed appropriate for the study because it is versatile and practical, especially to educators in that they identify present conditions and point to present needs (Osuala, 2001). This will enable the researchers to investigate the effect of influencing factors on students' academic performance in mathematics in Ghana.

3.2. Study population

The population of this study comprises all the public basic level school students and their teachers. For the paper, a total of 120 teachers were hand-picked. To ensure uniformity across the five schools surveyed, only mathematics subject teachers were chosen for the study. According to Gay (1996), a sample size of 20% or greater is sufficient for any research, so 120 teachers will be selected from a population of 250. As a result, researchers will choose a sample size of more than 40% of total respondents for the analysis. Respondents will be classified into school divisions using stratified random sampling.

3.3. Sampling Technique

Disproportionate stratified random sampling technique will be used in selecting the sample for this study. This is because it permitted the researchers to have representation from all the public senior secondary schools in the study area. Kolo (1992) thought that this kind of sampling entails that the random drawing of subjects from the population is not only stratified but that the stratification reflects an appropriate proportion to the

power of each stratum of the society.

3.4. Data Collection Instrument

A close-ended questionnaire and document will be used in the collection of data for this study. The questionnaire will comprise of the socio-demographic background of teachers. Also, the questionnaire will use the A five-point Likert scale (1= Strongly Disagree to 5 = Strongly Agree) to measure responses of respondents on the main determinants of students' performance in mathematics among public senior secondary school students in Ghana. The questionnaire will be in five sections. The Section A of the questionnaire will collect information on respondents' biographical information such as teachers' gender, age, working experience and level of qualification. The Section B of the questionnaire will also collect information on the average academic performance of students in mathematics over the period of one year. The Section C of the questionnaire will also collect information on how teacher-based factors, school-based factors and home-based factors affect students' academic performance. Section D further collect information on the various determinants of student's performance in Mathematics in Ghana.

3.5. Validity and Reliability of the Instrument

The instrument will be validated by experts who more than two decades of teaching research methods in College of Education, Ghana. This will be done to make sure the instrument measures what it was set to measure. The instrument was created based on certain variables contained in the literature, as well as measurable practices among the subjects and their populations, as well as the study's objectives. The instrument was also tested by measurement and assessment experts, who offered input that helped the instrument develop. Their suggestions were integrated into the instrument's final draft. All of these measures were taken to ensure the instrument's content, construct, and face validity. The reliability of the instrument will be determined using the test-retest method of reliability. Cronbach 0.86 was obtained to measure the internal consistency reliability of the questionnaire. The Cronbach value of .86 was deemed appropriate for the study as posited by Adamson & Prion (2013), that a reliability coefficient of (≥ 0.70) on a range of (0 -1) indicates good internal consistency reliability.

3.6. Data Processing and Analysis

The data collected will be sorted, coded and analyzed using Statistical Package for Social Science (SPSS) version 25 and the results will be illustrated in graphs, pie charts and tables. The study will make use of descriptive statistics such as cross tabulation and means and standard deviation and inferential statistics such as the multiple regression analysis tool. At the end of the study, it is expected that the main determinants of students' performance in mathematics among public basic level school students in Ghana as well as the practical ways to improve mathematical education will be realized.

4. RESULTS AND DISCUSSIONS

4.1. Sample Distribution of Respondents

This section dealt with the information collected on the background of the respondents. The demographic features of the teacher-respondents discussed in this section include the gender, level of qualification and teaching experience. Table 1 summarizes the demographic information of the respondents.

Table 1: Demographic Information of Respondents

Variable	Sub-scale	Frequency	Percentage
Gender	Male	77	64.2
	Female	43	35.8
Level of Qualification	Bachelors' Degree	85	70.8
	Masters' Degree	35	29.2
Teaching Experience	Below 1-5 years	48	40.0
	6-10 years	55	45.8
	Above 11 years	17	14.2

Information in Table 1 reveals that male teachers involved in the study were (77) representing 64.2% of the total number of teacher-respondents while (43) 35.8% of the respondents were females. This exhibits that there were more male teachers involved in the study than female colleagues. This echoes the inequality between male and female teachers in the Ghanaian education system especially for within the teacher populace. Again, it was found from the teachers that majority (85) 70.8% of them possessed bachelor's degree in the field of expertise and hence had acquired all the necessary knowledge that is required for them to be effective teachers who have adequate knowledge of student-centered teaching methods. Only (35) 29.2 % of the teachers had gone further to attain master's degree. Table 1 further shows that a significant number (55) 45.8% of the teachers had taught between 1-5 years. This was followed by (48) 40% of teachers having a teaching experience of 6-10 years in the five selected senior high schools involved in the study. Out of the 120 teachers, only (17) representing 14.2% had a longer teaching experience of more than 11 years. Information acquired from teachers revealed that they possessed the necessary skills and knowledge to help provide answers to the research questions that governed the study.

4.2. Main Findings of the Study

4.2.1. Research Question One: What is the academic performance of secondary school students in mathematics in Ghana?

This part of the study sought to first investigate students' average academic performance in mathematics in order to establish whether a positive or negative relationship exist between it and teacher, school and home-based factors in Ghana. The average examination scores for the three respective terms were collected from the respective school for analysis purpose. Mathematics teachers from respective selected five schools provided average students' academic performance during the 2019/2020 academic year. The cross-tabulation was used to analyze students' academic performance in mathematics based upon gender of students. The results of the respondents are shown in Table 2. This was done so that a fair idea of the academic performance of respondents can be known in order to ascertain the relationship their performance has with influencing factors in selected schools.

Table 2: Cross-tabulation of Average Performance in Mathematics

Form	Score Range of Students' Performance									Total
	80-100	70-79	60-69	55-59	50-54	45-49	40-44	35-39	0-34	
One	33	23	39	56	23	15	6	0	1	196
Two	25	36	26	45	16	9	3	1	0	161
Three	43	30	46	28	6	4	6	0	0	163
Total	101	89	111	129	45	28	15	1	1	520

Scale: 50-100 (very good performance), below 50 (poor performance)

From Table 2, it is detected that out of 520 students in selected schools, 346 scored 50-100 average scores in mathematics, indicating very good performance in mathematics. It was revealed that out of the 346 students, 101 of them had grade A1 (80-100) in mathematics. Thirty-Three (33) were Form One student, 25 in Form Two and 43 in their final year, Form Three. Out of 346, 89 students also had grade B2 ((70-79), even indicating very good performance in mathematics. It was again found that 111, 129, and 45 of the total students

scored between (60-69) B3, C4(55-59) and C5 (50-54) respectively. This infers that students performed very well in the mathematics in the Accra Metropolis, Ghana. Only 174 out of 520 students were an average score below 50. The next session summarizes the influencing factors of students' performance and how it influences student's academic performance.

4.2.2. Research Question Two: What are the main influencing factors of students' performance in mathematics among public basic level school students in Ghana?

Research Question Two clearly described the determinants that influences students' academic performance in mathematics. Using data collected from questionnaire adopted for the study, Table 3 summarizes influencing factors of students that determines students' academic performance in mathematics breaking it down into school-based factors, teacher-based factors and home-based factors.

Table 3 revealed that majority of teachers (31) representing 25.8% are of the perception that school-based factors such as teaching method of teachers significant determines students' academic performance in mathematics. This was followed by creation of availability of teaching and learning resources, conducive environment for students, teachers, attitude and school management. Table 3 further revealed that teacher-based factors such as classroom management, instructional strategy efficacy, level of qualification and student's engagement efficacy all appear to determine student's success and failure in passing mathematics. Finally, on the home-based factors influencing students' academic achievement.

Table 3: Influencing Factors of Students' Academic Performance

Indicators	Frequency	Percentage (%)	Rank
School-Based Factors influencing Students' Academic Performance			
Teachers' attitude	22	18.4	4
Teaching Methods	31	25.8	1
Teaching and Learning Resources	25	20.8	2
Conducive Environment	24	20	3
School Management	18	15	5
Teacher-Based Factors influencing Students' Academic Performance			
Teachers' level of qualification	24	20	3
Teachers' behavior	23	19.2	4
Classroom management	26	21.7	1
Students' engagement efficacy	22	18.3	5
Teacher's instructional strategy efficacy	25	20.8	2
Home-Based Factors influencing Students' Academic Performance			
Parent socio-cultural attachment	16	13.3	5
Religious background	24	20	2
Educational Level	18	15	4
Economic status	22	18.4	3
Home chores	15	12.5	6
Family Make up	25	20.8	1

4.2.3. Regression Analysis of the Effect of School Factors, Teacher Factors and Home Factors on Students Academic Achievement in Mathematics

Model Estimation

The researchers brought out the variables that influence students' academic performance in Mathematics among senior high school students in the Accra Metropolis of Ghana. The researchers identified the independent variables together with the dependent variables needed under this section for the study in a linear regression formula. Independent variables being Teacher Factors (TF), School Factors (SF) and Home Factors (HF) while the dependent variable being Average Mathematics Score (AMS) was developed in a simple regression which tends to show the relationship or the bond that exist between these variables. Mathematically, the linear regression formula is being represented as

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n + E.$$

However, the researcher decomposed X_1 , X_2 and X_3 as TF, SF and HF respectively and Y is AMS. By simple substitution, our model regression can be seen as:

$$AMS = \beta_0 + \beta_1 TF + \beta_2 SF + \beta_3 HF + E$$

Where: AMS= Average Mathematics Score, B_0 = Constant, TF= Teacher Factor, SF= School Factor, HF= Home Factor and E= Error Term

4.2.4. Research Question Three: How does influencing factors such as (Teacher-factors, school-factors and Home factors) affect students' academic performance in Mathematics in Ghana?

This section deals with the discussion of the results based on the data collected from the field. The data is used to answer the third research question that guided the study. Multiple regression specifically the Multiple regression was used to regress teacher-factors, school-factors, home-factors on senior high school student's academic performance in the Accra Metropolis in Ghana. Information in Table 4 summarizes the results and analysis of data collected from teacher's response to the questionnaire adopted for the study and the average score of students in mathematics. A model was tested to see if the model could predict how the influencing factors influences student's academic performance in mathematics in the Accra Metropolis in Ghana. The study conducted some preliminary assumptions test on the data on students average score in mathematics before going ahead to run the regression analysis. needed in order. The test revealed a normal distributed data and with a linear association between dependent and independent variables.

Model	Unstandardized Coefficients				Collinearity Statistics	
	B	Std. Error	T	Sig	Tolerance	VIF
(Constant)	2.723	.084	9.791	.000		
TF	1.869	.063	6.245	.000	1.201	44.618
SF	1.234	.219	8.466	.000	1.667	31.137
HF	-1.053	.341	-6.888	.000	1.001	33.450
Model 1	Model 2		Model 3			
F = 7123.11	F = 3213.22		F = 4813.44			
df = 1	df = 2		df = 3			
p = .000	p = .000		p = .000			
R ² = .913	R ² = .987		R ² = .999			
R ² Change = .913	R ² Change = .074		R ² Change = .000			

Table 4: Regression Analysis of Factors on Student Malpractices

Model: $AMS = 2.723 + 1.869TF + 1.234SF + 1.053HF + E$

The study finally proposed a final model to predict how teacher-factors, school-factors and home-factors affect students' performance in mathematics. The study found that independent variables such as teacher, school and home factors significantly ($p = .000$) influence the dependent variable (average mathematics score). Both the teacher-factors and school-factors significantly and positively predicts student's performance in the mathematics examination. But home-factors such as parents' socio-economic status, educational level, family

makeup and home chores significantly and negatively affected student's performance in mathematics examination. The positive significance level of teacher-factors and students' factors infers that an increase in any of these factors would increase student's performance in mathematics by respective coefficient of (1.869) and (1.234). However, a reduction in home-based factors revealed an increase in student's academic performance in mathematics. Thus, a 1% increase in each of the two independent variables (school and teachers' factors) would positively influence students' academic performance. However, a 1% decrease in home factor would also increase student's performance in mathematics examination malpractices. The R square for Model 3 shows that 99.9% of the variation in students' performance in mathematics examination malpractices is caused by school-factor, teacher-factors and home-factors. There appears to be a connection between the findings revealed from this study and those done by scholars in the field of study. Studies conducted by ((Wahid, Yusof, & Razak, 2014; Eng, T.H.; Li, V.L.; Julaihi, N.H, 2010; Sanders (2000) that teachers play a critical role in influencing students' success in school, throughout all subjects and hence, cannot be overstated. Again, findings of studies such as those by (Lai, Sadoulet & Janvry, 2009; Asikhia, 2010) that teacher's workshop is the school and the classroom where he teaches students. As a result, if the school and classroom(s) where a mathematics teacher teaches are receptive to effective teaching and learning, the skills and expertise he or she brings to the classroom will have a greater effect on students. Research have indicated that school quality affects learners' result. A close analysis of the types of homes, as well as the family's Socio-Economic Status (SES), will show that there is a connection between the home and student success. According to Brecko (2010), one of the most important goals of education is to ensure that every student has the opportunity to succeed in school and in life.

5. CONCLUSIONS

Based on the findings of the study, it can be concluded that study was carried out to explore the factors influencing students' academic performance in Mathematics among senior high schools in the Accra Metropolis. The study found that a significant number of the students performed above the average score of 50% in mathematics. The study further found that school-based factors such as teachers' attitude, methods, teaching and learning resources, conducive environment and school management significant influence students' academic performance in mathematics examination. It was again revealed that teacher-based factors such as their level of qualification, behavior, classroom management, self-efficacy in student's engagement and instructional strategies positively and significantly affects students' scores in mathematics. However, the study found that there exists a negative relationship between home-based factors of students and their academic performance. Factors such as parents' socio-cultural attachment, religious background, educational level, economic status and family make-up negatively and significantly affects students' academic performance in Mathematics.

6. AREA OF SFURTHER RESEARCH

The researcher is recommending research to be done in future on identifying student individual factors that makes them fail in mathematics while performing better in other science subjects such as Physics and Chemistry. The research must also be conducted on individual teacher factors that affect their teaching practice to the extent students are poorly performing in mathematics. This is highly suggested in order to widen the scope of the current study and initiate the process of creating evidenced based teaching strategies that will enhance the quality of instruction and learning to enhance students' performance in mathematics.

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