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LANGUAGE PERFORMANCE AND MATHEMATICS/SCIENCE PERFORMANCE: A CORRELATIONAL CASE STUDY OF JHS STUDENTS IN SEKONDI/TAKORADI AND SHAMA DISTRICTS.

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ABSTRACT

This paper is a correlational study aimed at finding out the relationship between language (English and Fante - a Ghanaian language) performance and mathematics and science performances. The main hypothesis tested in the study was whether there is a positive correlation between performance in language (English and Fante) and mathematics and science and whether it is significant or not. The data used for the study involved Basic Education Certificate Examination results of 740 Junior High School students from 10 schools in two district; Shama and Sekondi-Takoradi. The statistical tool used in testing the hypotheses was the *Spearman Correlation* (t-test) of the SPSS (a statistical package for social sciences). The study identified that there was strong positive correlation between language (Ghanaian language - Fante and English) performance and that of mathematics and science. The correlation between Ghanaian language and mathematics (r = 0.803) and between Ghanaian language and science (r = 0.809), and the correlation between English and mathematics (r = 0.850) and the correlation between English and science (r = 0.873) (a = .05) were found.

1 INTRODUCTION

Scientific and mathematics literacy for all students has been a major educational goal in many countries including Ghana. However, understanding science and mathematics has proven to be elusive for many Ghanaian children. It is an undeniable fact that to neglect mathematics and science education of students is to deprive them of basic education, handicap them for life, and deprive the nation of talented manpower and informed citizens. Ghanaian learners at the basic level perform abysmally in mathematics

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(Anamuah-Mensah & Mereku, 2005). For example, Ghana was at the 45th position out of 46 countries on the TIMSS-2003 (Trends in International Mathematics and Science Study) mathematics and science tests. One factor that might explain the abysmal performance of mathematics and science at the basic school level in Ghana is language since research has shown that learners with limited English proficiency score lower than students who are proficient in English on standardized tests of mathematics achievement in elementary school (Abedi, 2001). Ampiah (2006) in a study on STM (Science, Technology and Mathematics) project on attempt to improve quality of science and mathematics education in Ghana, found that pupils poor performance in mathematics and science among other things can be attributed to the use of English in the teaching process. To ensure that mathematics and science education is achieved, he indicated that the language of teaching these subjects should be understood by children, especially at the basic level.

Language is an essential element of learning, of thinking, the teaching process of communicating, and is essential for other academic subjects learning e.g. mathematics and science. The content of academic subjects is not taught without language and educational objectives advocate the development of fluency in the other subjects. This implies that the language of instruction is crucial to understanding mathematics and science. According to Capps and Pickreign (1993), mathematics and science is made meaningful through the use of language and students should be able to communicate adequately in that language. The language we initially learn mathematics and science through will provide the foundations to be built upon and developed within that language (Riordain & O'Donoghue, 2008). It is argued that a mastery of language of instruction is very important in learning mathematics and science (Lambert, 1990 cited in Yoong, 2005). Researchers contend that academic success requires sufficient academic language proficiency (Bailey & Butler, 2003). This implies that there is correlation between language performance and science and mathematics performances in particular and other academic subjects in general.

Knowledge of how language influences mathematics and science learning may make policy makers rethink of ways to formulate and implement sound language policies of education. It is therefore essential to find out which language (English or Ghanaian language – Fante) will enhance the teaching of science and mathematics at the basic level but the first step is to establish whether there is correlation between language performance and performance in mathematics and science. There has been plethora of studies of this kind in developed countries and in some countries where the language of instruction is different from the learner's L1 but there is the need for a study that serves the local context and the local professional; a study that focuses on the Ghanaian experience.

2 PURPOSE OF THE STUDY

The purpose of this study was to identify whether there is positive correlation between Ghanaian language (Fante) and mathematics and science and whether there is positive correlation between English and mathematics and science. The study also sought to find out whether the correlation between language (English and Fante) and mathematics and science are significant. This study will be followed with an experimental study to find out which of the two languages in question will enhance mathematics and science performance at the basic level.

3 RESEARCH HYPOTHESES

The study sought to test the following hypotheses:

1. There is positive correlation between performance in Ghanaian language (Fante) and mathematics and science in the BECE examination.
2. There is positive correlation between performance in English and mathematics and science in the BECE examination.
3. The correlation between performance in Ghanaian language (Fante) and in science and mathematics is significant.
4. The correlation between performance in English and in science and mathematics is significant.

4 THEORETICAL FRAMEWORK

Research has shown that language is important in learner performance on assessments in content-based areas such as mathematics (Abedi & Lord, 2001). In a review of research, Abedi, Hofstetter, and Lord (2004) found that students' language background is highly related to test performance. According to Cooking and Chipman (1988 cited in Abedi & Lord, 2001), in a study on conceptual issues related to mathematics achievement of language minority children, found that learners of English as a second language score lower on standardized test of mathematics achievement in elementary school than those who are proficient in English. The language of education has influence on the performance of learners in mathematics and science. Mji and Makgato (2006) in a study on factors associated with High School learners' poor performance in mathematics and science in South Africa noted that language was an indirect factor. The study identified that some participants complained of difficulty understanding some of the concepts used in both mathematics and physical science and that the use of English in teaching these subjects was a problem.

Marsh, Hau and Kong (2000) conducted a study to find out the pattern of achievement among students in mathematics from more than1200 secondary

schools in Hong Kong. The participants were put into two different groups; one group was instructed in English and the other in Chinese. After controlling the prior ability of the students and other factors for three years, they identified that students who were instructed in Chinese performed well in content subjects like science, mathematics, history and geography than those who were instructed in English. However, participants who were instructed in English had positive effects on English proficiency than Chinese proficiency. The implication of this study is that the language of instruction in teaching content subjects like mathematics and science has effect on students' performance (Maree & Molepo, 1999).

Two Ghanaian studies, though quite old but crucial to the present research are that of Collison (1972) and Andoh-Kumi (1992). In 1972, Collison conducted a study on language and concept development in Ghanaian elementary school children. The study compared the effects of learning science in English and in Ghanaian language on the cognitive growth of children. The target population was primary six pupils from Aburi who speak Akan (Akuapem Twi) and Accra who speak Ga. The study was designed in a way that each learner used both English and Ghanaian language (Akan and Ga) in class discussions in two different series of lessons. The pupils were made to handle the learning materials to get firsthand experience. They were given the chance to express orally what they had learned. The statements they made were measured as the knowledge they had acquired through these experience in science. The statements were analyzed using Vygostsky's conceptual levels through which a child grows. The analysis showed that there is higher contextual thinking in learning science when Ghanaian language is used than when English is used. It was also observed that students code-switched voluntarily from English to Ghanaian language during English sessions. This occurred when discussions in English could no longer progress. The conclusion from the study was that the periods of language switch were times for significant conceptual moves from previous lower levels in English to higher levels in the Ghanaian language. The study also claimed that when English was used as medium of instruction, a majority of the experimental pupils were deprived of conceptual training. Collison therefore concluded that Ghanaian language should be used in the teaching and learning of science since process skills like conceptualization and hypothesizing will be easily acquired by pupils in their own language.

A similar study was conducted by Andoh-Kumi in 1994. The first study used correlation tests to find out whether there is a relationship between language scores and scores in other school subjects. The study particularly examined the scores in English and Ghanaian language in some selected Junior Secondary Schools (JSS now JHS) and the "traditional" secondary schools. The primary concern was to gain a better understanding of complex behavior pattern, via school achievement. The main purpose of the study was to investigate the degree to which the medium of instruction is a factor in the

total achievement of students who have just completed the primary school and are introduced to the JSS (JHS) program. The study found that there was a significant positive relationship between language of instruction and overall achievement. This implies that the language of instruction could be a factor in a child's school achievement. An additional finding from the study was that the linguistic ability of a learner was closely related to his/her cognitive ability.

The above study was followed with an experimental study. It was to assess and evaluate the effects of schools that conduct their lessons mainly in L2 on the achievement of pupils at the basic education level. The study empirically looked at the scholastic achievement of selected learners as they function in two 'school' languages. The study sought to find out which of the two languages (English – L2 or L1-Akan) will enhance the learning of school subjects. Two groups of learners were selected. One group functioned in Akan (a Ghanaian language) only and the other in English only. The achievements of the two groups were compared to find out which of the two languages made learning easier and more productive for the learners. At the end of the study period, learners who were instructed in Akan performed better. This finding supports the view that language is an important factor in the educational achievement of learners and that the use of L1 might enhance the achievement of children. The study also revealed that the mastery of the language of instruction could lead to beneficial effects in achievement.

These research works and others (Zakaria & Aziz, 2011; Halimah, 2003; Sarojini, 2003; Abedi, Lord, Kim & Moyoshi, 2001; Kaphesi, 2001; Gfeller & Robinson, 1998) have indicated that the language of instruction in content subjects like mathematics and science has influence on performance. These studies highlight the significance of language ability in students' academic performance. It is therefore crucial to see the extent of relationship between language performance and mathematics and science.

5 METHODOLOGY

This is a quantitative correlational study aimed at identifying the relationship between language performance and mathematics and science. In this study, scores of students in the 2009 Basic Education Certificate Examination (BECE) conducted by the West African Examination Council (WAEC) were used. This examination is meant for all Basic 9 (Grade 9) students in Ghana to qualify them for Senior High School education. The study used scores of 740 students from ten Junior High Schools in the Shama District and Sekondi/Takoradi Metropolitan Assembly. Three schools each were selected from Shama District and Takoradi Sub-metropolitan Assembly, while four were selected from Sekondi Sub-metropolitan Assembly. The simple stratified random sampling approach was used because the researcher wanted to cover all three districts/sub-metropolitan assemblies. Three of the

schools were private (preparatory schools); one from each area. Both public and private schools were used because the researcher wanted to see whether they both show the same trend. The scores of every student in Ghanaian language, English, science, and mathematics were used in this study. The scores of a student for each subject range from 1 to 10. One being the best grade, while ten is the worst grade. The Ghanaian language used in the study is Fante, which is the Ghanaian language of the locality where the study was conducted. The statistical tool used in testing the hypothesis was the *Spearman Correlation* of the SPSS (a statistical package for social sciences). The t-test of the SPSS was used with alpha at .05 and Correlation significance at .01 level (2-tailed). The independent variable is language (English and Fante) while the dependent variable is science and mathematic

Table 1: Schools used in the study

School/Code	N	Rural/Urban	District/Sub-Metro	Private/Public
1	104	Urban	Shama	Public
2	61	Rural	Shama	Private
3	82	Urban	Takoradi	Private
4	102	Urban	Takoradi	Public
5	86	Rural	Sekondi	Public
6	74	Rural	Shama	Public
7	79	Urban	Takoradi	Public
8	40	Urban	Sekondi	Public
9	38	Rural	Sekondi	Public
10	74	Urban	Sekondi	Private

6 FINDINGS AND DISCUSSION

The findings of the research are discussed based on the testing of the hypotheses postulated at the beginning of this article. The hypotheses were first tested on combined school (group) basis and later on individual school basis. The means of the various schools were also calculated to support the findings of the hypotheses. The following were the findings:

6.1 Testing the Hypotheses

The hypotheses were tested using the *Spearman Correlation* t- test. They were first tested using the scores of 740 students from the ten schools by correlating scores from the four subjects areas; English, Ghanaian language, science and mathematics.

Hypothesis 1: There is positive correlation between performance in Ghanaian language (Fante) and mathematics and science in the BECE examination.

The test for the hypothesis revealed that the correlation between Ghanaian language (Fante) performance and science was .809, while that of Fante and mathematics was .803. This indicates that there is positive correlation between Ghanaian language (Fante) performance and science and mathematics.

Hypothesis 2: There is positive correlation between performance in English and mathematics and science in the BECE examination.

This hypothesis was to test whether there was positive correlation between performance in English and that of mathematics and science. The hypothesis was not rejected. There was positive correlation between English performance and that of mathematics and science. The correlation between English performance and that of science was .873 and that of mathematics was .850.

Hypothesis 3: The correlation between performance in Ghanaian language (Fante) and in science and mathematics is significant.

This hypothesis was tested with a=.05 as significant. The correlation between Ghanaian language (Fante) performance and science was .809, while that of Fante and mathematics was .803 were all found to be significant. The hypothesis was also not rejected.

Hypothesis 4: The correlation between performance in English and in science and mathematics is significant.

The hypothesis was not rejected. There was positive correlation between English performance and that of science and mathematics. The correlation between English and mathematics was .873 and that of mathematics was .850. This was significant at alpha (a) = .05.

Table 2: Correlation of Test scores on performance between language (Fante and English) performance and mathematics and science.

			FANTE	SCIENCE	ENGLISH	MATHS
Spearman's rho	FANTE	Correlation Coefficient	1.000	.809	.832	.803
		Sig. (2-tailed)	.	.000	.000	.000
		N	740	740	740	740
	SCIENCE	Correlation Coefficient	.809	1.000	.873	.866
		Sig. (2-tailed)	.000	.	.000	.000
		N	740	740	740	740
	ENGLISH	Correlation Coefficient	.832	.873	1.000	.850
		Sig. (2-tailed)	.000	.000	.	.000
		N	740	740	740	740

	MATHS	Correlation Coefficient	.803	.866	.850	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	740	740	740	740

* Correlation is significant at the .01 level (2-tailed).

The results for the above hypotheses are presented in the table above.

The confirmation of hypotheses one and two above collaborate with earlier findings by Sibayan (1995) which indicates that when children's native language is used in teaching mathematics their performance is high. This implies that there is positive correlation between native language performance and that of mathematics. The same finding confirms earlier study by Howie and Plomp (2004) and Andoh-Kumi (1994). The study among others identified that pupils in classes where the pupils and the teachers mostly interacted in the official media of instruction (English or Afrikaans) were more likely to achieve better results in mathematics. These studies and others conducted in South Africa about the relationship between language and mathematics and science (Adler, 1998; Setati & Adler, 2000; Setati, Adler, Reid & Bapoo, 2001) confirm the findings of the present study. The work of Marsh, Hau and Kong (2000) is also validated by the findings of the study.

The present study has also found that there is significant relationship between language performance and mathematics. This confirms earlier study by Sibayan (1999) in Philippines that there is significant difference in the mathematics performance of pupils who used their native language. Finally, this study confirms earlier findings by Rauchas, Konidaris, Rosman and Sanders (2006) that there is a much more stronger statistically significant positive correlation between language (English) and science (computer science) performance.

6.2 Testing the hypotheses on individual school basis

The four hypotheses tested above were later tested on individual school basis. The results were as follows:

Table 3: School 1 (Public)
Correlations

			FANTE	ENGLISH	MATHS	GEN.SCI
Spearman's rho	FANTE	Correlation Coefficient	1.000	.766	.626	.738
		Sig. (2-tailed)	.	.000	.000	.000
		N	104	104	104	104
	ENGLISH	Correlation Coefficient	.766	1.000	.707	.835
		Sig. (2-tailed)	.000	.	.000	.000
		N	104	104	104	104
	MATHS	Correlation Coefficient	.626	.707	1.000	.765
		Sig. (2-tailed)	.000	.000	.	.000

		N	104	104	104	104
	GEN.SCI	Correlation Coefficient	.738	.835	.765	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	104	104	104	104

* Correlation is significant at the .01 level (2-tailed).

Table 4: School 2 (Private)
Correlations

			FANTE	GEN.SCI	MATHS	ENGLISH
Spearman's rho	FANTE	Correlation Coefficient	1.000	.568	.551	.618
		Sig. (2-tailed)	.	.000	.000	.000
		N	61	61	61	61
	GEN.SCI	Correlation Coefficient	.568	1.000	.720	.622
		Sig. (2-tailed)	.000	.	.000	.000
		N	61	61	61	61
	MATHS	Correlation Coefficient	.551	.720	1.000	.544
		Sig. (2-tailed)	.000	.000	.	.000
		N	61	61	61	61
	ENGLISH	Correlation Coefficient	.618	.622	.544	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	61	61	61	61

* Correlation is significant at the .01 level (2-tailed).

Table 5: School 3 (Private)
Correlations

			FANTE	GEN.SCI	MATH	ENGLISH
Spearman's rho	FANTE	Correlation Coefficient	1.000	.440	.399	.486
		Sig. (2-tailed)	.	.000	.000	.000
		N	82	82	82	82
	GEN.SCI	Correlation Coefficient	.440	1.000	.631	.528
		Sig. (2-tailed)	.000	.	.000	.000
		N	82	82	82	82
	MATH	Correlation Coefficient	.399	.631	1.000	.612
		Sig. (2-tailed)	.000	.000	.	.000
		N	82	82	82	82
	ENGLISH	Correlation Coefficient	.486	.528	.612	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	82	82	82	82

* Correlation is significant at the .01 level (2-tailed).

Table 6: School 4 (Public)
Correlations

			FANTE	GEN.SCI	MATHS	ENGLISH
Spearman's rho	FANTE	Correlation Coefficient	1.000	.556	.533	.584
		Sig. (2-tailed)	.	.000	.000	.000
		N	102	102	102	102
	GEN.SCI	Correlation Coefficient	.556	1.000	.760	.594
		Sig. (2-tailed)	.000	.	.000	.000
		N	102	102	102	102
	MATHS	Correlation Coefficient	.533	.760	1.000	.635
		Sig. (2-tailed)	.000	.000	.	.000
		N	102	102	102	102
	ENGLISH	Correlation Coefficient	.584	.594	.635	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	102	102	102	102

* Correlation is significant at the .01 level (2-tailed).

Table 7: School 5 (Public)
Correlations

			FANTE	GEN.SCI	MATHS	ENG
Spearman's rho	FANTE	Correlation Coefficient	1.000	.635	.492	.773
		Sig. (2-tailed)	.	.000	.000	.000
		N	86	86	86	86
	GEN.SCI	Correlation Coefficient	.635	1.000	.626	.635
		Sig. (2-tailed)	.000	.	.000	.000
		N	86	86	86	86
	MATHS	Correlation Coefficient	.492	.626	1.000	.607
		Sig. (2-tailed)	.000	.000	.	.000
		N	86	86	86	86
	ENG	Correlation Coefficient	.773	.635	.607	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	86	86	86	86

* Correlation is significant at the .01 level (2-tailed).

Table 8: School 6 (Public)
Correlations

			FANTE	GEN.SCI	MATHS	ENG
Spearman's rho	FANTE	Correlation Coefficient	1.000	.646	.476	.646
		Sig. (2-tailed)	.	.000	.000	.000
		N	74	74	74	74
	GEN.SCI	Correlation Coefficient	.646	1.000	.535	.671
		Sig. (2-tailed)	.000	.	.000	.000
		N	74	74	74	74
	MATHS	Correlation Coefficient	.476	.535	1.000	.424
		Sig. (2-tailed)	.000	.000	.	.000
		N	74	74	74	74
	ENG	Correlation Coefficient	.646	.671	.424	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	74	74	74	74

* Correlation is significant at the .01 level (2-tailed).

Table 9: School 7 (Public)
Correlations

			FANTE	GEN.SCI	MATHS	ENG
Spearman's rho	FANTE	Correlation Coefficient	1.000	.759	.621	.851
		Sig. (2-tailed)	.	.000	.000	.000
		N	79	79	79	79
	GEN.SCI	Correlation Coefficient	.759	1.000	.689	.816
		Sig. (2-tailed)	.000	.	.000	.000
		N	79	79	79	79
	MATHS	Correlation Coefficient	.621	.689	1.000	.663
		Sig. (2-tailed)	.000	.000	.	.000
		N	79	79	79	79
	ENG	Correlation Coefficient	.851	.816	.663	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	79	79	79	79

* Correlation is significant at the .01 level (2-tailed).

Table 10: School 8 (Public)
Correlations

			FANTE	GEN.SCI	MATHS	ENG
Spearman's rho	FANTE	Correlation Coefficient	1.000	.487	.184	.489
		Sig. (2-tailed)	.	.001	.256	.001
		N	40	40	40	40
	GEN.SCI	Correlation Coefficient	.487	1.000	.539	.648
		Sig. (2-tailed)	.001	.	.000	.000
		N	40	40	40	40
	MATHS	Correlation Coefficient	.184	.539	1.000	.337
		Sig. (2-tailed)	.256	.000	.	.033
		N	40	40	40	40
	ENG	Correlation Coefficient	.489	.648	.337	1.000
		Sig. (2-tailed)	.001	.000	.033	-
		N	40	40	40	40

* Correlation is significant at the .01 level (2-tailed).

Table 11: School 9 (Public)
Correlations

			FANTE	GEN.SCI	MATHS	ENG
Spearman's rho	FANTE	Correlation Coefficient	1.000	.547	.340	.415
		Sig. (2-tailed)	.	.000	.000	.000
		N	38	38	38	38
	GEN.SCI	Correlation Coefficient	.547	1.000	.732	.743
		Sig. (2-tailed)	.000	.	.000	.000
		N	38	38	38	38
	MATHS	Correlation Coefficient	.340	.732	1.000	.673
		Sig. (2-tailed)	.000	.000	.	.000
		N	38	38	38	38
	ENG	Correlation Coefficient	.415	.743	.673	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	38	38	38	38

* Correlation is significant at the .01 level (2-tailed).

Table 12: School 10 (Private)
Correlations

			FANTE	GEN.SCI	MATHS	ENG
Spearman's rho	FANTE	Correlation Coefficient	1.000	.670	.700	.683
		Sig. (2-tailed)	.	.000	.000	.000
		N	74	74	74	74
	GEN.SCI	Correlation Coefficient	.670	1.000	.736	.732
		Sig. (2-tailed)	.000	.	.000	.000
		N	74	74	74	74
	MATHS	Correlation Coefficient	.700	.736	1.000	.726
		Sig. (2-tailed)	.000	.000	.	.000
		N	74	74	74	74
	ENG	Correlation Coefficient	.683	.732	.726	1.000
		Sig. (2-tailed)	.000	.000	.000	.
		N	74	74	74	74

* Correlation is significant at the .01 level (2-tailed).

The test for the first and third hypotheses on individual school basis showed that 50% (five schools) had strong (r >.5) positive correlation between Ghanaian language and mathematics while 80% (eight schools) showed strong/significant (r >.5) positive correlation between Ghanaian language and general science. Two schools; 3 and 8 had a positive correlation of .399 and .487 respectively between Ghanaian language (Fante) and science. From the data analysis, 50% of the schools (schools 3, 5, 6, 8, and 9) showed weak positive correlation between Ghanaian language (Fante) and mathematics, while schools 3 and 8 (20%) also showed weak positive correlation between Ghanaian language and science. In the case of school 8, the correlation between mathematics and Ghanaian language (Fante) (r = .184) was not significant (p = .256). There seems to be a stronger positive correlation between Ghanaian language (Fante) and science than between Ghanaian language (Fante) and mathematics.

The test for the second and fourth hypotheses showed the following results: There was positive and significant correlation between English and science performance for all schools. All schools had a correlation of r is greater than 0.5. Only 2 schools (20%) (Schools 6 and 8) had a positive correlation of less than 0.5 between English and mathematics performance. School 6 had a positive correlation of .424, while School 8 had a positive

correlation of .337. Eighty percent (80%) of the schools showed positive and strong correlation between English and mathematics.

The results shown above indicate that in all those schools where Ghanaian language and English performance were high, students performance in science and mathematics were also high and vis-versa. The implication of the above results is that the students who were better performers in language were better in science and mathematics, which suggests that strengthening students' language skills may also positively affect their mathematics and science skills. The conclusion that can be drawn from the study is that performance in language enhances performance in science and mathematics which concurs with studies reviewed earlier in the literature section.

7 MEAN SCORES OF JHS EXAMINATION OF THE TEN SCHOOLS.

To support the above assertion, the means of language performance (Ghanaian language and English) mathematics, and science were calculated. The result is presented in the table below.

The table below indicates that schools with low means in language (Ghanaian language - Fante and English) had low means in mathematics and science and those with high means in language had high means in mathematics and science. For example, School 3 with a means score of 1.8293 in English and 1.3780 in Fante had 1.6341 in mathematics and 1.6341 in science. In the same vein, School 10 with a mean of 1.3919 in English and 2.8108 in Fante had a mean score of 2.1892 in mathematics and 1.5135 in science. However, School 5 with means of 5.5814 in English and 6.0349 in Fante had mean scores of 6.1628 in mathematics and 6.5814 in science. Additionally, School 9 with means scores of 6.5789 and 6.5789 in English and Fante respectively had means scores of 5.9211 in mathematics and 6.6053 in science. Analysis from the data above confirms that there is positive correlation between language performance and science/mathematics performance.

8 CONCLUSION

Science and mathematics are crucial to national development and that nations cannot afford to train citizens who are scientifically and mathematically weak. One factor that has been identified to account for the appalling performance in mathematics and science is language. To establish the fact of which language enhances the learning of mathematics and science at the basic education level, it is imperative to demonstrate that positive correlation exists between performance in language and science and mathematics. The present study used the scores of 740 students in the Junior High School Certificate Examination conducted in Ghana to establish whether

there is positive and significant correlation between language (English and Fante) performance and that of science and mathematics performances. The study has found that there is positive and significant correlation between language performance and that of mathematics and science but the question as to which of the two languages will enhance better performance in mathematics and science is yet to be addressed.

Table 12: Means of schools

SCHOOL		ENGLISH	FANTE	MATHS	SCIENCE
1.00	Mean	5.1538	4.8846	5.5481	4.8269
	N	104	104	104	104
	Std. Deviation	1.4466	1.9020	1.7839	1.6920
2.00	Mean	3.3115	4.0164	3.9016	3.9672
	N	61	61	61	61
	Std. Deviation	1.3359	1.6980	1.4911	1.3901
3.00	Mean	1.8293	1.3780	1.6341	1.6341
	N	82	82	82	82
	Std. Deviation	.8433	.7800	.7937	.7619
4.00	Mean	2.6176	2.4706	2.4804	2.8824
	N	102	102	102	102
	Std. Deviation	.9855	1.2324	1.0692	1.1458
5.00	Mean	5.5814	6.0349	6.1628	6.5814
	N	86	86	86	86
	Std. Deviation	1.4830	1.5526	1.5097	1.5298
6.00	Mean	5.0000	5.8919	5.8514	5.5676
	N	74	74	74	74
	Std. Deviation	1.1103	5.9670	1.3105	1.3857
7.00	Mean	4.1139	5.3924	4.9114	4.8608
	N	79	79	79	79
	Std. Deviation	1.6329	2.1627	1.6266	1.6387
8.00	Mean	3.9000	4.7750	3.6250	3.6750
	N	40	40	40	40
	Std. Deviation	.9819	1.0975	.7048	.9443
9.00	Mean	6.5789	6.5789	5.9211	6.6053
	N	38	38	38	38
	Std. Deviation	1.7496	1.7496	1.8066	2.0340
10.00	Mean	1.3919	2.8108	2.1892	1.5135
	N	74	74	74	74
	Std. Deviation	.6153	1.3816	1.2013	.7980
Total	Mean	3.8365	4.2541	4.1689	4.1135
	N	740	740	740	740
	Std. Deviation	1.9868	2.8984	2.1550	2.1931

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