



Advances in Research
5(5): 1-8, 2015, Article no.AIR.19889
ISSN: 2348-0394

SCIENCEDOMAIN *international*
www.sciencedomain.org



Student Mathematics Interest in Ghana: The Role of Parent Interest, Gender, Basic School Attended and Fear of Basic School Mathematics Teacher

Yarhands Dissou Arthur^{1*}, Samuel Asiedu Addo² and Jonathan Annan³

¹Department of Mechanical Technology Education, College of Technology Education, University of Education, Winneba-Kumasi Campus P.O. Box 1277 Kumasi, Ghana.

²Department of Mathematics Education, Faculty of Science Education, University of Education, Winneba, Ghana.

³Department of Information Systems and Decision Sciences, KNUST School of Business, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

Authors' contributions

This work was carried out in collaboration between all authors. Author YDA designed the study, designed and administered questionnaire, conducted statistical analysis and wrote the first draft of the manuscript. Author SAA managed the literature searches and proof read the paper as well as final editing and author JA managed the discussion and final editing as well as proof reading. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AIR/2015/19889

Editor(s):

(1) Vishnu Narayan Mishra, Sardar Vallabhbhai National Institute of Technology, Surat, Gujarat, India.

Reviewers:

(1) Milton Rosa, Universidade Federal de Ouro Preto, Brazil.

(2) Barry Chametzky, Ozarks Technical Community College, USA.

Complete Peer review History: <http://sciencedomain.org/review-history/11172>

Original Research Article

Received 2nd July 2015
Accepted 17th July 2015
Published 31st August 2015

ABSTRACT

To ensure successful learning and advanced achievement, subject-specific interest is essential. While many factors and strategies may be important in building a student's interest in mathematics, variables such as the type of basic schools attended, parents' interest in mathematics as well as the fear of imposed on students by their basic school teachers have not been completely investigated in the Ghanaian education system. Towards this goal, the current paper addresses the effect of parent interest, the type of basic school attended, the fear imposed by basic school mathematics teacher on a student's interest in mathematics. Using descriptive and inferential statistical methods, data collected from 260 post senior high school student through structured questionnaires was analyzed.

*Corresponding author: E-mail: day1981boy@yahoo.com;

The study found that parent interest and value for mathematics significantly influenced students interest and joy in solving mathematical problems. Moreover, we also observed that the fear imposed by basic school mathematics teachers was found to significantly influence students' interest. The study further found that the type of basic school attended and gender are factors that do not influence students' interest in mathematics. In addition to concluding that a student's interest is influenced by both parent interest and the fear of basic school mathematics teacher, the study also showed that the type of basic school attended and gender does not affect the students' interest in mathematics.

Keywords: Parent interest; mathematics interest; Ghana education; student Interest.

1. INTRODUCTION

Ensuring successful learning and advanced achievement, subject-specific interest is an essential component [1]. The role of parent in education is very essential in the development of students' interest. There are many factors and strategies that lead to building student interest in mathematics. According to [2] one of the effective methods of developing a student's interest is by assigning students to their achievement levels. The effect of parental value and teacher support on a student's interest is found to be positively and significantly related as described by [3]. Interestingly, there is a perception that a parent's value for mathematics affects student's interest and achievement. The interest demonstrated in learning activities has been shown to translate to high levels of achievement [4]. Students who report high competence beliefs in their learning activities show interest in subject-specific activities [5]. The choices made by students at all levels of education are greatly influenced by their interest in the subjects [6]. This will mean that higher interest in mathematics related subjects may influence ones interest in education. In view of such significant and great role student interest, parent interest and value as well as gender and the type of basic school attended play in mathematics learning processes, it is appropriate to investigate the Ghanaian perspective as contribution to knowledge on student's interest. A parent's involvement in shaping a child's interest in subject specifics is important in a student's learning processes. The study by [7] argues that, socializing behavior demonstrated by parents significantly impact on their children involvement in mathematics activities. The model of parental influence by [8,9] has been documented to contribute significantly in shaping the student beliefs, values and performance. Studies have shown that parents support for their children is important in the interest development process and have proposed interventions to assist parent

to express importance of mathematics to their children [10]. The theory of self-determination proposes that students' internal need for independence, competence and relatedness is facilitated by interest as an aspect of intrinsic motivation [11]. The level of parental support such as encouragement, communication of positive expectation and ability is noted to influence student achievement [12]. The interest of a student is also found to be predicted by parental support, the children's quest for independence and relatedness as documented by [13]. Studies has further shown that teacher's role in growing student's interest relate closely to motivation for student in mathematics [14]. The student hold the perception that, the teachers' emotional support extended to them is a motivation in building interest [15,16]. A study by [17] confirmed a teacher's instructional attitude impart students' learning outcome. Thus, a teacher affects the student interest in various ways. The role of parent interest, the type of basic school the student attended the fear of basic school mathematics teacher and the gender of the student in influencing the student interest in solving mathematical problems worth investigating. This will help mathematics educator as well as policy makers' deal specifically with Ghanaian student interest in mathematics.

1.1 Objective of Study

The present study aims at

- i. Investigating the effect of parent interest in mathematics on the child interest in solving mathematical problems.
- ii. Determining whether the type of basic school attended has effect on the student interest in mathematics.
- iii. Assessing the effect of fear of basic school mathematics teacher on the student interest in mathematics.

- iv. Determine the effect of fear of basics school mathematics teacher on gender stereotyping.

1.2 Research Hypotheses

The following research hypotheses were emerged from the objectives stated above.

- i. Parent interest in mathematics significantly influences their children interest in mathematics.
- ii. The type of basic school student attendant affect the interest of the student in mathematics significantly
- iii. The fear imposed by basic school mathematics teachers affect student interest in mathematics significantly
- iv. The fear imposed by basic school mathematics teachers affect gender stereotyping significantly.

1.3 Research Questions

The researchers arrived at the following question as guide in arriving at their set objective and hypothesis.

- i. Does the parent interest in mathematics affect their children's interest in solving mathematical problems?
- ii. Is there any effect on student interest by the type of basic school student attended?
- iii. Can the fear of basic school mathematics teacher affect the student interest in mathematics?
- iv. What is the effect of fear imposed by basic school mathematics teacher on gender stereotyping?

2. RESEARCH METHODOLOGY

2.1 Research Subjects and Sampling Methods

The study adopts exploratory research design and quantitative approach to research where questionnaires were used in collection of data. The respondents for this work were undergraduate students from the University of Education, Kumasi campus. The study used a non-probability sampling method called convenience sampling in the data collection process. In order to ensure that inappropriate and ambiguous questionnaires items were modified or deleted, pre-testing of the

questionnaire items was implemented. In total 300 questionnaires were administered for the post-testing and after screening the 260 questionnaires were found to valid on average representing 86.7% response rate.

2.2 Statistical Methods and Software Application

The study applied both descriptive and inferential statistical techniques in arriving at the results. The study used SPSS version 16 to generate all the results and Microsoft excel for the tables. The chi-square test of independence was used to assess the various hypothesis stated. The P-values were reported and all tests were conducted at 5% level of significance.

3. DATA ANALYSIS AND RESULTS

3.1 Introduction

The data analyses first explore the demographic of the respondents. The demographic properties of the respondents considered in this study include the gender, age, type of basic school attended, and the region of origin of the respondent. The study also looked at variables such as the type of basic school student attended, the respondents parents interest in mathematics, the fear basic school teacher impose on their students, and whether the student enjoyed solving mathematics problems.

3.2 Analysis of Demographic Properties

Our results indicate that 62.6% of the respondents were males, whilst 35.5% were females as indicated in Table 1. It was further noted that 54% of the respondents were within the age bracket of 21-25 year old, 28.6% of the respondent were between age of 26-30 years old and 12.2% of the respondents were between the ages of 31-40 years as indicated in Table 2. The result of the field data also shows that 66.4% of the respondent attendant government basic school while 34.6% of the respondent attended private basic school as shown in Table 3. The result presented from the data indicated that, over 40% of the respondents originate from the Ashanti region of Ghana while the remaining 60% originate from the other nine regions as presented in Table 4. The study posed the question on whether the student enjoy working mathematics and their parent interest in mathematics. The results presented on the

question of whether the student enjoy working mathematics showed that 63.1% of the student enjoy working with mathematics, while 36.9% responded to the fact that they do not enjoy working with mathematics. The study also indicated that 65.2% of the respondent's parents are interested in mathematics while 36.9% of the respondent's parent does not like mathematics.

The question of whether the student were scared of their basic school mathematics teacher was investigated and found that 43.6% of the respondents were scared of their basic school mathematics teachers while 56.4% of the respondents were not scared of their basic school mathematics teachers.

Table 1. Gender of Respondents

Gender	Frequency	Percent	Valid percent
Male	164	62.6	63.8
Female	93	35.5	36.2
Total	257	98.1	100

Table 2. Age of Respondents

Age categories	Frequency	Percent	Valid percent
15-20	6	2.3	2.4
21-25	138	52.7	54.1
26-30	75	28.6	29.4
31-40	32	12.2	12.5
41and above	4	1.5	1.6
Total	255	97.3	100

Table 3. The Type of Basic School Respondent Attended

Basic school categories	Frequency	Percent	Valid percent
Government	174	66.4	70.2
Private	74	28.2	29.8
Total	248	94.7	100

Table 4. Respondent Region of Origin

Region	Frequency	Percent	Valid percent
Asante	103	39.3	40.9
Brong ahafo	24	9.2	9.5
Volta	36	13.7	14.3
Central	9	3.4	3.6
Northen	11	4.2	4.4
Upper east	20	7.6	7.9
Upper wast	6	2.3	2.4
Western	15	5.7	6
Eastern	20	7.6	7.9
G/a	8	3.1	3.2
Total	252	96.2	100

Table 5. Does the Student Enjoy Working with Mathematics?

Response	Frequency	Percent	Valid percent
Yes	164	62.6	63.1
No	96	36.6	36.9
Total	260	99.2	100

Table 6. Does the Parent of the Student like Mathematics?

Response	Frequency	Percent	Valid percent
Yes	163	62.2	65.2
No	87	33.2	34.8
Total	250	95.4	100

Table 7. Was the Student Scared of the Basic School Mathematics Teacher?

Response	Frequency	Percent	Valid percent
Yes	112	42.7	43.6
No	145	55.3	56.4
Total	257	98.1	100

3.3 Effect of Fear Imposed by Basic School Teacher on Gender Stereotyping

The study sought to find out the effect of the fear imposed on students by mathematics teacher during their basic education. The question of whether the respondents were scared of basic school mathematics teacher and the gender of the respondents were cross tabulated. The results indicate that 66 of the male respondents were scared of their basic school mathematics teachers while 45 female respondents were scared of their basic school mathematics teachers. The results of the study further indicate that 97 of the male respondents were not scared of the basic school mathematics teachers and 44 of the female respondents were not scared of their basic school mathematics teachers. In order to achieve the purpose of this study, we further investigated the effect of the fear imposed by basic school mathematics teachers on gender stereotyping using chi-square test for independence. The study tested the hypothesis that the fear of basic school mathematics teacher does not affect gender stereotyping in mathematics. The test result confirmed the hypothesis that indeed gender stereotyping is

independent on the fear imposed by basic school mathematics teacher with p-value (0.145) > 0.05 as shown in Table 8.

3.4 Effect of Basic School Attended on Student's Joy in Working with Mathematics

To further establish whether the basic attended had effect on ones enthusiasm in mathematics, the views of the study participants were sought. From the result, it was observed that 109 of the respondents who attended government (public) schools enjoyed working with mathematics and 44 respondents who attended private basic school enjoy working with mathematics. The result of the study further indicates that 64 of the respondents from government schools do not enjoy working with mathematics, whilst 26 of the respondents from private basic schools do not enjoy working with mathematics. Further analysis on the effect of basic school attended on student's joy in working with mathematics was accessed using chi-square test of independence. The result of the analysis shows that the type of basic school attended is independent on whether students enjoy working mathematics or not with p-value (0.774) > 0.05 as shown in Table 9.

Table 8. Effect of Fear Imposed by Basic School Teacher on Gender Stereotyping

	Gender	Fear of Basic School Mathematics Teacher		P-value
		YES	NO	
Gender	Male	66	97	0.145
	Female	45	44	
	Total	111	141	

Table 9. Effect of Basic School Attended on Student's joy in Working with Mathematics

		Students Enjoy Solving Mathematics Problem		Total	P-value
		Yes	No		
Type of basic school attended	Government	109	64	173	0.774
	Private	44	29	73	
Total		153	93	246	

3.5 Effect of Parent Interest on Their Child Interest in Mathematics

The parental influence on a child's performance can take different forms and this study investigated the effect of parent's interest in mathematics on the child's interest. The result of the current study revealed that 119 of the respondents whose parent liked mathematics enjoyed working with mathematics while 40 respondents whose parent do not like mathematics enjoy working with mathematics. The is result continue to reveal that 43 of the respondents whose parent like mathematics does not enjoy working with mathematics while 47 of the respondents whose parent do not like mathematics do not enjoy working mathematics. The data support the claim that parents' interest in mathematics positively influences their children's interest in mathematics. Thus, a student's interest in mathematics depends on their parents' interest in mathematics with p-value <0.00 in favor of the alternative hypothesis as shown in Table 10.

3.6 Effects of Fear Imposed on Student on the Student Interest in Mathematics

There are many factors that may cause a student to be scared of a teacher. In Ghana one of such causes is the use of canes during lessons. The responses on the whether the respondents were scared of their basic school teachers were cross-tabulated with the students' interest in mathematics. It was found collected that 51 of the students who were scared of their basic school teacher enjoyed working with mathematics with 110 of the students who were not scared of the basic school mathematics teachers enjoy working with mathematics. Sixty one (61) of the respondents who were not scared of their basic school teacher do not like working with mathematics, whilst 35 of the respondents who were scared of their basic school mathematics teachers still enjoy working with mathematics. The results of the study finally indicate that the fear imposed on students during their basic education have significant effect on

the student interest in mathematics as shown in Table 11.

4. DISCUSSION

The present study investigated into students' interest in mathematics by analyzing data collected toward the factors underlying such phenomenon. The study reported on the effect of fear imposed on student by their teachers as it affects their interest in working mathematics problem. The result of the study implies that if a teacher makes the classroom environment friendly, it will motivate student's quest in studying mathematics. The result further implies that as students develop fear in their basic school mathematics teachers possibly through the fear of making mistakes; it may hunt their desire for mathematics which will negatively influence their interest. The study further noted the effect of parental interest in mathematics on their children's interest in mathematics which confirms the study by [7]. This result may further infer that if the parents are interested in mathematics; their children are more likely to have interest in mathematics. Furthermore, we observed that the type of basic school attended does not affect a student's interest in mathematics. This result may additionally support the fact that the type of basic school attended does not affect the child interest in mathematics, therefore, whether a child attends private basic school or public school does not affect the child's interest in mathematics. The implication is that there are other factors that may contribute to building students interest apart from the type of basic school attended. This confirms the work by [12] that a student's interest can be predicted by the parental support for their children and [11] who proposed that parental support, such as encouragement, communication of positive expectation and does influence student achievements. More to the earlier result is the fact that the fear imposed on students by the basic school mathematics teachers does not affect gender interest in mathematics. We show that if gender stereotyping exists in mathematics it may not be influenced by the basic school mathematics teacher.

Table 10. Effect of Parent Interest on their Child Interest in Mathematics

		Student Enjoy Working Mathematics		Total	P-value
		Yes	No		
Does your parent like mathematics	Yes	119	43	162	0.00
	No	40	47	87	
Total		159	90	249	

Table 11. Effects of Fear Imposed on Student on the Student Interest in Mathematics

		Enjoy Working Mathematics?		Total	P-value
		Yes	No		
Fear of basic school mathematics teacher	Yes	51	61	112	0.00
	No	110	35	145	
Total		161	96	257	

5. CONCLUSION AND RECOMMENDATION

5.1 The Study Arrived at the Following Conclusions after Carefully Analyzing the Data Collected

- The study tested the hypothesis that the fear of basic school mathematics teacher does not affect gender stereotyping in mathematics and concludes that indeed gender stereotyping is independent on the fear imposed by basic school mathematics teachers. The result though very interest yet seem not confirm any study with diverse or confirmatory view.
- The analysis on the effect of basic school attended on student’s joy in working with mathematics concludes that the type of basic school attended is independent on whether students enjoy studying mathematics. This result is to a large extent consistent with the arguments put forward by [12].
- The study additionally suggests that the fear imposed on students during their basic education have significant effect on the student interest in working mathematics.
- It is recommended that parents who don’t like mathematics should make effort in showing interest in their children lessons and classwork in mathematics since their interest will significantly impact on their children’s interest as confirmed by [7,9,12]. The study further recommends that teaching of mathematics should be made interesting and student should be allowed to participate in class without any fear of

being beating when they are wrong in their course of contributing in the classroom.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Fisher PH, Dobbs-Oates J, Doctoroff GL, Arnold DH. Early math interest and the development of math skills. *Journal of Educational Psychology*. 2012;104: 673-681.
2. Watt HMG. Development of adolescents’ self-perceptions, values, and task perceptions according to gender and domain in 7th- through 11th-Grade Australian students. *Child Development*. 2004;75:1556-1574.
3. Lazarides R, Ittel A. Instructional quality and attitudes towards mathematics: Do self-concept and interest differ across students’ patterns of perceived instructional quality in mathematics classrooms. *Child Development Research*; 2012. DOI: 10.1155//2012/813920.
4. Eccles JS. Subjective task value and the Eccles et al. model of achievement-related choices. In Elliott AJ, Dweck CS. (Eds.), *Handbook of Competence and Motivation* New York: Guilford. 2005;105-121.
5. Marsh HW, Trautwein U, Lüdtke O, Köller O, Baumert J. Academic self-concept, interest, grades and standardized test scores: Reciprocal effects models of

- causal ordering. *Child Development*. 2005; 76:397-416.
DOI: 10.1111/j.1467-8624.2005.00853.x.
6. Wang MT. Educational and career interests in math: A longitudinal examination of the links between classroom environment, motivational beliefs, and interests. *Developmental Psychology*. 2012;48:1643-1657.
DOI: 10.1037/a0027247.
 7. Simpkins SD, Davis-Kean PE, Eccles JS. Parents' socializing behavior and children's participation in math, science, and computer out-of-school activities. *Applied Developmental Science*. 2005;9:14-30.
 8. Eccles (Parsons) J, Adler TF, Kaczala CM. Socialization of achievement attitudes and beliefs: Parental influences. *Child Development*. 1982;53:310-321.
 9. Eccles J, Adler TF, Futterman R, Goff SB, Kaczala CM, Meece J, et al. Expectancies, values and academic behaviors. In Spence JT. (Ed.), *Achievement and achievement motives: Psychological and Sociological Approaches*. San Francisco, CA: Freeman. 1983;75-146.
 10. Harackiewicz JM, Rozek CS, Hulleman CS, Hyde JS. Helping parents to motivate adolescents in mathematics and science: An experimental test of a utility-value intervention. *Psychological Science*. 2012; 23:899-906.
 11. Deci EL, Ryan RM. *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press; 1985.
 12. Ing M. Can parents influence children's mathematics achievement and persistence in STEM careers? *Journal of Career Development*; 2013.
Available:<http://jcd.sagepub.com/>
DOI: 10.1177/0894845313481672.
 13. Aunola K, Viljaranta J, Lehtinen E, Nurmi JE. The role of maternal support of competence, autonomy and relatedness in children's interests and mastery orientation. *Learning and Individual Differences*. 2013;25:171-177.
DOI: 10.1016/j.lindif.2013.02.002.
 14. Goodenow C. Classroom belonging among early adolescent students' relationships to motivation and achievement. *Journal of Early Adolescence*. 1993;13:21-43.
 15. Skaalvik EM, Skaalvik S. School goal structure: Associations with students' perceptions of their teachers as emotionally supportive, academic self-concept, intrinsic motivation, effort, and help seeking behavior. *International Journal of Educational Research*; 2013.
DOI: 10.1016/j.ijer.2013.03.007.
 16. Yu-Je L, Chia-Hui C, Ching-Yaw C. The influences of interest in learning and learning hours on learning outcomes of vocational college students in Taiwan: using a teacher's instructional attitude as the moderator. *Global Journal of Engineering Education*. 2011;13(3).
 17. Simpkins SD, Fredricks JA, Eccles JS. Charting the Eccles' expectancy-value model from mothers' beliefs in childhood to youths' activities in adolescence. *Developmental Psychology*. 2012;48: 1019-1032.

© 2015 Arthur et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://sciencedomain.org/review-history/11172>