

**PARENTS PERCEPTION TOWARDS FEMALE WARDS STUDYING MATHEMATICS
IN COLLEGES OF EDUCATION- A CASE STUDY IN BRONG AHAFO REGION IN
GHANA**

Baffour Awuah Jacob

General and Liberal Studies Department, Sunyani Polytechnic, Ghana.

Ernest Kwarteng

General and Liberal Studies Department, Sunyani Polytechnic, Ghana.

Samuel Acheampong

Mathematics Department, Berekum College of Education, Ghana.

Abstract:

The paper brings to focus Parents' perception about their female wards studying mathematics. The study used the three Colleges of Education in Brong – Ahafo Regions in Ghana. A stratified sampling was used to select 500 parents. The data included in-depth interview and questionnaire, and were analysed by using Descriptive Statistics. In this paper, results from the data collected through mixed method show that parents hold significantly different views or perceptions towards females in Mathematics. For the females to fully develop interest in mathematics in Colleges of Education, the study recommends that, parents' perception towards females in Mathematics must be developed.

Keywords: Female; Mathematics; Parents; Perception.

1.Introduction

Women in Ghana, especially Brong Ahafo have been represented at lower rates than men in both Mathematics and Science programs and careers in the Region. This pattern has led to a significantly higher concentration of male professional Mathematicians as compared to women. Additionally, Hari (2003), states that the disparity between male and female has led to careers in Education, English, etc. are seen to be as “feminine” careers and areas of study. As a result of these social factors, women's low participation rates in Mathematics have been perpetuated over time. Numerous explanations and points of view have been offered to explain women's low participation rates in this field. These explanations vary from beliefs regarding parent's physiological inability to succeed as Mathematicians, to environmental factors in women's childhoods that discourage them from entering science and Mathematics fields.

Asin et al. (1974), stated that differential treatment of males and females begins at an early age, starting with parents and discovered that parents of female children generally do not buy as many mathematics- related toys and games as to parents of males, thus putting their female children at a distinct disadvantage when they enter the classroom. Others also found that parents of female children are more likely to down play the importance of mathematics (Parsons et al., 1982).

Research shows that when parents endorse the stereotype that mathematics is a male domain, their daughters underestimate their mathematics ability,” (Bhanot, 2005). The researcher continued to state that, parents communicate gender stereotypes to their children, and hypothesized that parents inadvertently impose stereotypes when they give unsolicited help with their child's homework.

Hari (2003), stated that “many parents belief that males would take care of them in their old age, thus providing them with a sense of security about their future while females once married would be expected to take care of those in the families they married into. Thus in order to ensure that their sons will be able to carry out this responsibility, parents feel that they should provide their sons with education so that they can in turn get employment”.

Further, parents who hold stronger mathematics gender stereotypes in general also have more gender stereotyped beliefs about their own child's mathematics ability, controlling for the child's previous year's mathematics grade (Jacobs, 1991). In other words, parents who believe that boys are better at mathematics than girls also apply this stereotype to the abilities of their own children, despite their access to a great deal of information about their child's actual mathematics achievement, which should moderate these views. Notably, parents' beliefs about their children's mathematics ability predict children's self-perceptions in mathematics even more strongly than children's own past mathematics achievement; further, children's self-perceptions about math affect their subsequent mathematics achievement (Jacobs 1991; Parsons et al., 1982). Taken together, these results suggest a causal model in which parents' gender stereotypes bias their beliefs about their own child's math ability and these beliefs affect children's own self-perceptions about math, which in turn affect children's subsequent mathematics achievement.

Due to the societal orientation of individuals, the type of tasks given to both male and female also differ. Tasks and chores are often assigned according to what parents perceive as gender appropriate, with boys more often assigned to outdoor tasks and girls more often assigned to inside tasks, (Rossen-Wasser, 1992).

Expectations of parents for their children differ depending on their gender. Expectations, such as hard work, intelligence, honesty, ambitions, aggressiveness, independence and success have been reported for males while expectations such as good mother, good wife, kindness, loving and attractiveness have been reported for females (Hoffman, 1977).

Parental expectations may influence the occupations and roles children select for themselves, (Rosen-Wasser, 1992). Greenfield et al. (1982) found that men are motivated towards professions that deal with inanimate objects, e.g. Mathematics, engineering; while women are motivated towards professions that involve interaction with people, e.g. teaching and nursing.

The significance of parent perception toward education and school is less well understood, although perceptions are believed to comprise a key dimension of the relationship between parents and school (Eccles & Harold, 1996). Parents convey perception about education to their children during out-of-school hours and these attitudes are reflected in the child's classroom behavior (Kellaghan et al., 1993).

A new research by University of Wisconsin-Milwaukee (UWM) (2008), stated that, 'most parents and many teachers believe that if middle-school and high-school girls show no interest in science or mathematics, there's little anyone can do about it. They indicate that, the self-confidence instilled by parents and teachers is more important for young girls learning mathematics and science than their initial interest. They continue to say that while interest is certainly a factor in getting older girls to study and pursue a career in these disciplines, more attention should be given to building confidence in their abilities early in their education.

Fumer and Duffy (2002), stated that "parent can be the source of negativity regarding Mathematics, sometimes without realizing the harm they are causing". They continue to say that "parents who are afraid of mathematics can pass that on to the next generation by modeling behavior of their own discomfort with the subject.

Molly (2005), indicates that "parents who support gender stereotype and who give intrusive help on homework unintentionally undermine a child's self-confidence in mathematics".

According to Doris (1988) "Parents' mathematics-related perceptions and attributions varied with their child's level of mathematics ability and gender. Parents credited daughters with more effort than sons, and sons with more talent than daughters for successful mathematics performances. These attribution patterns predicted sex-linked variations in parents' ratings of their child's effort and talent".

Fathers think that they are and have always been better at Mathematics, that Mathematics is and always has been easier for them, that they needed to expand less effort to do well at Mathematics

that they enjoy and have enjoyed. They see Mathematics as more useful and important to them. The research continued to state that, fathers are more positive towards Mathematics and have a more positive self-concept regarding their Mathematic abilities, (Kaczala, et al, 1979).

Frimpong (1998), wrote that “Educating a female probably the better on a whole than educating a man or male yet, paradoxically, both society and parents invest less in educating females than educating males. He also observed that ‘Females cannot be educated to higher levels. Parents investing in girls education may seem less attractive than in boys or males education. This in addition to what has been quoted above is a clear indication to be one of the courses of female’s inability to do well in Mathematics.

Jodi (2006), pointed out that when parents reach the point that they can no longer help their students with their mathematics, take advantage of the plethora of mathematics resources available.

1.1. Purpose of the study

This paper seeks to consider developing parents’ interest in their female wards studying Mathematics on a higher level or scale and provide specific techniques that can help to avoid and alleviate parents’ negative perception towards Mathematics.

1. 2. Research Questions

In order to achieve the aim of the paper the following questions were posed and answers obtained from respondents in the survey.

- (i) To what extent do the perceptions of parents contribute to the achievement of female students' studying Mathematics in Colleges of Education?
- (ii) What ways can parents help to develop and sustain in their female wards studying Mathematics?

1.3. Methodology

The research design is a survey. A survey was used to obtain quantitative and qualitative information about parents’ gender- related beliefs and how parents’ negative perception on females’ in mathematics could be improved.

The population for the study consists of all parents in the Brong - Ahafo Region in Ghana.

The sampling frame for the study consisted of all parents in the three districts where College of Education are located that is, Tano South, Atebubu and Berekum,.

A stratified sampling was used to select 500 parents from the three districts. One hundred and sixty parents from Tano South and Atebubu districts and one hundred and eighty parents from Berekum district as Berekum district being bigger than the remaining two districts, were randomly selected and interviewed.

A combination of questionnaire and interview were used to collect information. The information helps to access parents’ perception towards females in Mathematics. The questionnaire consisted of ten items. These were read and interpreted to parents who can neither read nor write. Part of the questionnaire was in five likert scale form and the responder was requested to put a tick against one option.

The interview was unstructured in order to try to determine more of what Parents really think about female studying mathematics. The interview followed the administering of the questionnaires so as to get wider and deeper perspective on the way parents’ perception towards female in mathematics can be improved.

To find out how parents perception towards female in Mathematics, the questionnaire to the parents were administered. The questionnaires were administered to 500 parents within the three districts. They were given enough time to respond to them. They were not allowed to keep the questionnaire till the following day to avoid others from influencing them. Immediately after the questionnaire the interview was conducted. All of the interviews were recorded on audiotape and later transcribed.

2. Results and Discussions

After receiving the responses from the questionnaire, the data was coded from the questionnaire and entered it into SPSS. Using this statistical software package and ran several descriptive statistical analysis, the following results were obtained.

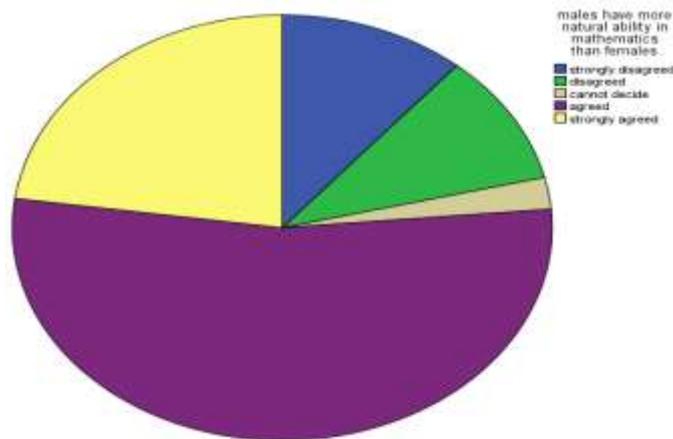


Figure 1: Natural ability in mathematics.

Figure 1 shows that, 53.6% agreed and 2.2% strongly agreed that males have natural ability in Mathematics than females while 11.2% strongly disagreed and 10.0% disagreed, and 2.4 percent could not decide. Where majority of the parents agreed with this statement is more important to them but this finding could not be considered surprising if one recalls that several past studies have shown female Mathematics students to be less confident in their Mathematical abilities than their male counterparts. However this result could be interpreted that women who are highly skilled in Mathematics are choosing teaching Mathematics as a profession whereas equally skilled men may choose other careers, or perhaps male teachers are likely to take their mathematical abilities for granted than are females teachers. If this were the case then this finding would indicate agreement with those past studies that females have less confident in Mathematics or less natural ability to do Mathematics than males.

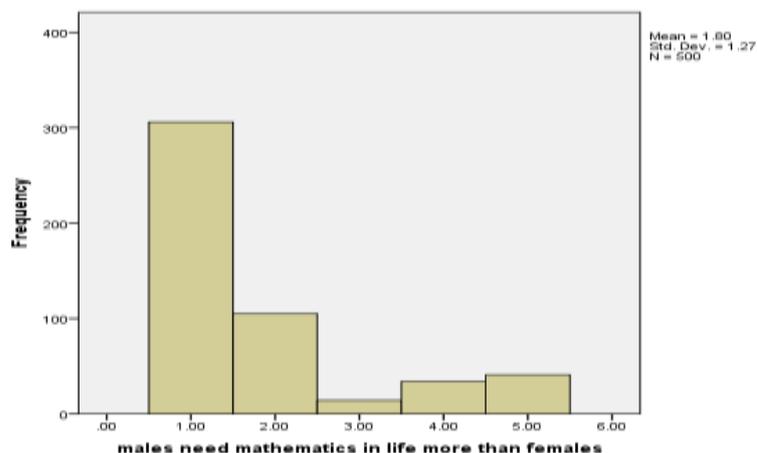
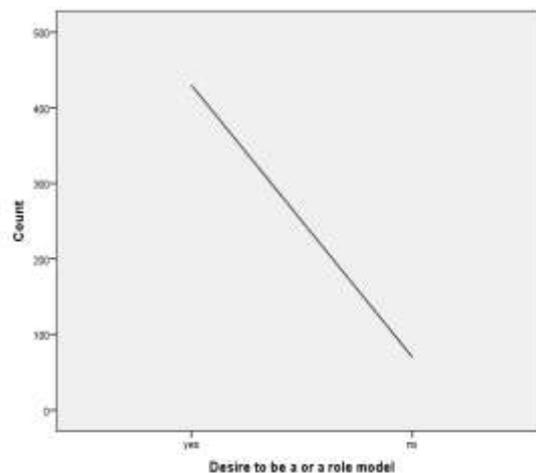


Fig 2: Females need mathematics.

From Fig 2, it is showed that 61.2% of the parents strongly disagreed and 21.0% disagreed representing 306 and 106 parents respectively. 8.2% agreed and 6.8% strongly agreed to the statement where as 2.8 percent could not decide on this question.

This is an interesting finding because most parents belief that females were not born to do had jobs as stated by Frimpong (1998) in a research work into the study on Mathematics noted that, most of the parents answer to the questions why they don't like Mathematics, a parent openly expressed that "Females in general were created to be cared for and not to explore much. Female therefore on this note cannot face difficult challenges in life like the study of Mathematics, therefore Mathematics is for males like man taking difficult task to kill a snake and other construction jobs, so also, reading of Mathematics is like one of these difficult jobs and males must be responsible for the reading of Mathematics.

Parents' response on the "desire to be a mentor or a role model" is as shown in Fig 3.



From fig 3, 86% of the parents indicated that a desire to be a mentor or role model was important or very important in their decisions to become basic school teachers while 14% answered NO.

This finding indicates that these women who are highly skilled in Mathematics are drawn to teaching as a career because of a desire to work with young people. A desire to work with young people is typically a trait of female dominated profession as women are socialized into accepting roles that involved helping other people. Parent's interest and appreciation about the female education in Mathematics is very important because it has an immense effect on females. For instance if parents do not view female in Mathematics as important, they will not put in their quota towards the successful running of females to study Mathematics in higher levels. They will be unwilling to supply the needed materials if they are called to do so.

Table 1: How parents promote interest in females to study mathematics

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid no statement	27	5.4	5.4	5.4
organise extra classes	54	10.8	10.8	16.2
equal opportunity	80	16.0	16.0	32.2
motivation	120	24.0	24.0	56.2
encouragement	76	15.2	15.2	71.4
award to females	67	13.4	13.4	84.8
cut down home activities	76	15.2	15.2	100.0
Total	500	100.0	100.0	

(Source: field survey, July, 2014)

From table 1, 120 and 76 parents representing 24% and 15.2% respectively stated that, females must always be motivated and encouraged. 13.4% said they will award females who excel in mathematics just to develop their interest in the study of mathematics. 15.2% of the female teachers who are parents thus those whose wards are students in the Colleges of Education said that they will cut down some of the household activities for the students to have enough time to study Mathematics. 10.8% also stated that they will organize extra classes for their pupils without taken money from them.

Based on responses provided by parents- both literates and illiterates, to the survey questions and as well as opened- ended and interviewed questions “How can parents promote interest in female students to do Mathematics”, the educational background of the two were not discussed since the study is not based on literate or illiterate parents who exercise influence female in Mathematics. A parent categorically stated that “how can I get my ward to like Mathematics when I don’t like it myself?” According to Eugenia (2010) stated that, if you say YOU hate mathematics, be aware you are shaping your child’s attitude toward mathematics, particularly if you’re a mother speaking to a daughter. Your daughter loves you and seeks to be just like you. She may pick up the false message *mathematics isn’t for girls*. Now most moms would never say, “I hate reading. I hate books. I haven’t read a book since high school.” Yet somehow it’s okay for parents to disparage their mathematics skills. Parents’ involvement on academic success has not only been noted among researchers, but also among policy makers who have integrated efforts aimed at increasing parent involvement into broader educational policy initiatives.

Being a mentor; Females entering Mathematics domain, are in desperate need of a strong female mentor with experience in Mathematics profession. If this sounds well, then the female mentor pair with a female student who is interested in receiving your guidance and insight. Develop a one-on-one relationship with a female student struggling to overcome the problem of Mathematics in the School. Remember to keep in positive perception when talking to females about Mathematics.

Again, Parents must encourage females to get involve in Mathematics at school. Parents must team-up with the parents of their daughter’s female friends; monitor their Mathematics classes to make sure they are all doing well. Assign a few of the parents (mothers if possible) to be “on call “to help with Mathematics homework.

It’s also important for parents to know that hard work does not mean to be lonely. Parents often think that Physicians or chemists work on their own; no they involve a lot of group work.

Parents can be a role model too. “Never, ever say in front of your child, ‘I can’t do mathematics,’”. “Encourage mathematics inquiry. Try to think about how things work and ask questions, have interesting discussions, and go out and find the answers. Parents, who are women with Mathematics-related jobs, can become a much needed example to females. Women must volunteer

to speak to local Mathematics classes, have a talk during open days, talk on local FM stations etc. about your profession and simply share your Mathematics experiences with females.

3. Conclusions and Recommendations

Historically there has been a scarcity of women in the Mathematics professions worldwide (Morin, 2003). Morin continue to state that this lack of women in Mathematics have created a model for understanding this phenomenon. This model envisions a linear trajectory for a variety of reasons. Several researchers have focused on identifying the factors that affect females' decisions to drop out or not continue to higher Mathematics. This paper has found that, parents negative perceptions are some of the factors that influence females' decisions to drop out of school or not continue for higher Mathematics.

Again, this paper has found that, parent's interest and appreciation about the female education in Mathematics is very important because it has an immense effect on females. For instance if parents do not view female in Mathematics as important, they will not put in their quota towards the successful running of females to study Mathematics in higher levels. Finally, females studying Mathematics in Brong – Ahafo Region in Ghana, in higher levels of education have suffered erosion over time because of the negative perceptions that parents have for females in the study of Mathematics to higher levels of education

To enable parents have positive perception towards females' studying mathematics, the following are recommended:

Do not share your negative mathematics experience with your children but encourage them. If you feel you must share this experience, frame it this way:

- I had trouble with mathematics but you won't because you have a parent who really cares about your success in mathematics and will help you.
- Your teacher also cares about your success in mathematics and will help you.

Parents need to constantly make positive statements about female in mathematics since whatever they say in or outside the classroom affect the female student's interest in the study of mathematics.

Parents should try to advice their wards who are interested in the study of mathematics pair with a female mentor.

Parents who are female teachers share their experiences with others and incorporate each other's idea and practice in their own teaching levels of mathematics.

Parents need to encourage and motive female students in the study of mathematics.

Appropriate Mathematical register in parents' perception towards females in mathematics in colleges of education would be an interesting area for further research.

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