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BREAKING BARRIERS: THE IMPACT OF TEACHER EXPECTATIONS ON GENDER ATTITUDES TOWARD LEARNING MATHEMATICS IN KEIYO DISTRICT, KENYA (2001–2004)

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ABSTRACT

This study examines the impact of teacher expectations on gender differences in attitudes toward learning mathematics among secondary school students in Keiyo District, Kenya (2001–2004). Research has consistently shown that gender disparities in mathematics performance and participation are influenced by social factors, including teacher expectations. Using a descriptive survey design and ex-post facto approach, the study involved 300 students (150 boys and 150 girls) and 15 mathematics teachers (5 female and 10 male) from selected secondary schools in Keiyo District. Data was collected using questionnaires and face-to-face interviews and analyzed through descriptive and inferential statistics, including Chi-square tests.The findings indicate a significant relationship between students' perceptions of teacher expectations and their attitudes toward mathematics. Boys were more likely to perceive positive reinforcement from teachers, while girls often felt overlooked or assumed to struggle with the subject. Additionally, teachers had higher expectations for boys, which influenced classroom interactions, engagement, and student motivation. The study also found that teacher willingness to assist students had a stronger impact on boys' attitudes than on girls' attitudes. These findings highlight the need for gender-sensitive teaching strategies and equitable classroom practices to ensure that both boys and girls develop positive attitudes and confidence in mathematics.

KEYWORDS: *Gender differences, teacher expectations, mathematics attitudes, secondary school students, Keiyo District, Kenya, mathematics performance, classroom interactions, gender disparities, student motivation, Chi-square analysis.*

1. INTRODUCTION

Mathematics is a very important subject in the school curriculum. Its importance is not only for the national purpose but also for the individual's life. In view of this importance, it could be more desirable for all students in Kenyan secondary schools to put extra efforts in the learning of mathematics. But this seems not to be the case. Such differences in attitudes towards learning of mathematics tend to favour male students especially in their high school stages. Such differences are well noted in Britain as well as other countries of the world (Orton 1987). Globally, mathematics has been viewed as a subject favouring male students (Sherman and Fenemma, 1977).They further support the idea that the differences between girls and boys in learning of mathematics tend to exist particularly in activities that required complex reasoning; that the differences increased about the onset of adolescence; and that the differences were recognized by many leading mathematics educators.

The same experience is realized in Africa according to African Academy of Sciences (AAS) in collaboration with the Association for the Development of Education in Africa (ADEA) on issues of women's performance in mathematics. In this case, Aderson (1991) found that it is important for teachers to be enthusiastic and use more indirect teaching behaviours. Ninth grade pupils' interest in mathematics was found by Reed (1968) in Bolaji (1996) to increase with teachers who were warm and who utilised students' intrinsic motivation.

The differences in mathematics achievement that occur in the early years are in favour of females whereas differences in mathematics achievements as well as in attitudes favouring males generally occur during the high school years. Buxton (1984) in Owiti (2001) asserts that:

> "Mathematics is the gate and key of science – neglect of mathematics works injury of all knowledge since he who is ignorant of it cannot view the other sciences or the things in the world…" (pg 214).

From the fore going, it is clear that girls, like boys, need mathematics in their private life, working life, socio-economic and political life of the country of which they are citizens. Cockroft (1982) adds that mathematics is a strategic subject in the development of science and technology. He asserts that this subject is fundamental in the study of physical sciences and engineering of all types. It plays a significant role in character building, boosting

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self-esteem and providing opportunities for developing curiosity and creativity. It is surely hard to imagine how normal life can look like without use of mathematics of some kind.

Cockcroft (Ibid.) further asserts that parents, teachers, and peers teach the students intellectual, social, economic and cultural skills, which can enable them to acquire cultural roles. In relation to this, Buxton (1984) explains that as a result of socialization patterns and other factors within the school, girls rate mathematics very low compared to boys at the adolescent stage.

Daily Nation, March 1996 attributed the trend of students' performance in mathematics to their attitudes towards learning of the subject. Research has shown that girls' attitudes towards learning of mathematics and related courses are more negative as stated by Buxton (1984). Wesonga (1996) noted that girls' poor performances in mathematics are as a result of negative feelings (attitudes) inculcated in them resulting in the feeling of inadequacy. Fennema (1990) according to her research says that gender difference in attitude towards learning of mathematics comes in as a result of peer pressure, teachers' attitude and student's home background.

An analysis of the last four years (2000-2003) of KCSE mathematics results by KNEC (2004) indicates that over 81% of the candidates have been performing poorly in the subject over the years [See Table 1]. Gender differences can be seen in the 2003 KCSE mathematics results which revealed that girls had a mean grade of 16.05% compared to boys with a mean grade of 22.10% thus girls performed poorly compared to boys. The same case was realized in the year 2002 where girls got a mean grade of 16.44% and boys had a mean grade of 22.53 % [See Table 2].

In Keiyo District, KCSE mathematics results for 2001-2003 indicate that over 80% of students have been failing in mathematics (D.E.O's office, Keiyo District) as shown in Table 3. Another set of data obtained from the same DEO's office show that in KCSE mathematics results for 2001 to 2003, over 76% of the students have been failing in mathematics as shown in table 4.

While releasing KCSE results for the year 2004, the minister for Education, Science and Technology, Professor George Saitoti, asserted that the performance in Mathematics and Sciences were still below average especially for girls as compared to boys (Daily Nation, March 2nd, 2005).

It against this back drop that the researcher set to investigate the gender differences and attitudes towards learning of mathematics at the secondary school level in Keiyo District.

Table 1 Candidates Overall Performance in Mathematics for the Last Four years (2000-2003).

YEAR	PAPER	CANDIDATURE	MAXIMUM SCORE	MEAN SCORE %	STANDARD DEVIATION
2000	1		100	17.46	16.44
	2		100	15.05	16.02
	Overall	181947	200	33.22	31.00
2001	1		100	18.83	18.45
	2		100	18.62	17.15
	Overall	193702	200	37.43	34.00
2002	1		100	19.95	19.38
	2		100	19.51	19.25
	Overall	197118	200	39.39	37.95
2003	1		100	17.17	16.31
	2		100	21.45	19.86
	Overall	206480	200	38.62	36.17

Source: KNEC, 2003.

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Table 2 Candidates Performance in 2002-2003 KCSE Mathematics by Gender.

SUBJECT NAME & CODE	2002				2003			
	FEMALE		MALE		FEMALE		MALE	
	NO. SAT	MEAN %	NO. SAT	MEAN %	NO. SAT	MEAN %	NO. SAT	MEAN %
MATHEMATICS (121)	91647	16.44	105471	22.53	95615	16.05	110865	22.10

Source: KNEC, 2004.

Table 3 Quality of Grades in KCSE Mathematics in Keiyo District (2001-2003)

Year	2001		2002		2003	
Quality:	Number	%	Number	%	Number	%
D + and Above	140	7.1	216	11.5	138	7.6
D - and below	535	27	491	26	354	19

Source: DEO's Office, Keiyo District, Kenya.

Table 4 Mean Scores for KCSE Mathematics in Keiyo District (2001-2003)

Year	2001	2002	2003
Mean Score	2.7850	3.1400	3.1722
High Mark Score	6.7301	7.6750	7.3200
Low Mark Score	1.1428	1.4118	1.8095

Source: DEO's Office, Keiyo District, Kenya.

2. STATEMENT OF THE PROBLEM

A positive attitude toward mathematics is essential for academic success, as it enhances students' engagement, motivation, and overall performance. Ideally, all students, regardless of gender, should have equal opportunities and encouragement to develop confidence in mathematics. Teachers play a crucial role in shaping students' learning experiences, and their expectations can significantly influence students' perceptions of their own abilities. When students feel supported and challenged appropriately, they are more likely to develop a positive attitude toward mathematics, leading to better performance and increased participation in mathematics-related fields.

However, in reality, there remains a notable gender disparity in mathematics achievement and participation. Fewer girls than boys excel in mathematics, and many opt out of mathematics-related courses at higher education levels. This under representation limits opportunities for girls in careers that require strong mathematical skills. Research suggests that social factors, including the expectations set by teachers, may contribute to students' attitudes toward mathematics. If students perceive that their teachers have low expectations of them, it may negatively impact their confidence, motivation, and willingness to engage with the subject.

Given this concern, it is necessary to examine whether students' perceptions of teacher expectations influence their attitudes toward learning mathematics. Understanding this relationship can provide valuable insights into how teacher-student interactions shape learning experiences and inform strategies for fostering a more supportive and inclusive mathematics learning environment. This study, therefore, seeks to explore the impact of teacher expectations on students' attitudes, with a particular focus on gender differences among secondary school students in Keiyo District.

3. RESEARCH QUESTION

1. Do the students' perceptions of teachers' expectations influence their attitudes towards learning of mathematics?

4. RESEARCH HYPOTHESIS

Ho_2: There is no significant relationship between students' perception of teacher's expectations and their attitudes towards learning of mathematics.

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5. LITERATURE REVIEW

5.1. Theoritical Framework

5.1.1. The Interaction Theory

The Interaction Theory by Mead (1934), as cited in Sadler (1992), emphasizes the role of social interactions in shaping an individual's self-concept, attitudes, and behaviors. According to this theory, students develop their perceptions of themselves and their abilities through interactions with significant others, such as parents, teachers, and peers. These perceptions, in turn, influence their motivation, confidence, and academic performance.

This study was anchored on the Interaction Theory because it explains how teacher expectations can shape students' attitudes toward learning mathematics. The theory suggests that when students perceive positive expectations from their teachers, they are more likely to develop confidence, motivation, and a positive attitude toward the subject. Conversely, if they sense low expectations, they may lose confidence and develop a negative outlook, leading to lower performance. Given that this study investigates how students' perceptions of teacher expectations influenced their attitudes toward mathematics in Keiyo District between 2001 and 2004, the Interaction Theory provides a strong framework for understanding the impact of teacher-student interactions on learning outcomes.

5.2. Empirical Review

5.2.1. Attitude and Performance in Mathematics

Research on the impact of school type single-sex versus co-educational on attitudes and performance in mathematics has produced mixed findings. Studies such as those by Fennema (1996) suggest that single-sex schools foster more positive attitudes toward mathematics, particularly among girls. This is attributed to a learning environment free from the higher levels of social competition and harassment often found in co-educational settings. Conversely, Leder (1982) argues that co-educational schools provide greater opportunities to counter gender biases in mathematics learning. Despite these differing perspectives, the persistence of gender disparities in mathematics performance highlights the need to explore underlying social and psychological factors that influence students' attitudes toward the subject.

Fear of success, first introduced by Horner (1968), has been proposed as a key psychological factor influencing gender differences in mathematics achievement. Horner suggested that societal expectations often create a conflict for females, discouraging them from excelling in traditionally male-dominated subjects like mathematics. Fennema (1996) further notes that disparities between male and female students persist in mathematical self-beliefs and career choices, with social and economic factors also playing a role. Research by Sherman (1982) describes mathematics as a "critical filter" that limits women's entry into technical and scientific careers, reinforcing the idea that early attitudes toward the subject can have long-term consequences.

Studies also indicate that classroom interactions and teacher expectations contribute significantly to students' attitudes and performance in mathematics. Norwich et al. (1989) highlight that female students, along with certain ethnic and socio-economic groups, often face lower academic expectations, which can influence their engagement and achievement in mathematics. Additionally, Fennema et al. (1998) review common classroom practices and note that teacher and parental perceptions may discourage girls from pursuing mathematics. Similarly, Ogoma (1987) found a direct link between attitudes and achievement in mathematics among primary school students in Kenya. Given the evidence that attitudes strongly correlate with performance (Fennema et al., 1990; Eshiwani, 1975), it is crucial to investigate how students' perceptions of teacher expectations influence their attitudes toward learning mathematics, as these perceptions may contribute to the gender gap in achievement.

5.2.2. Teachers' Expectations and Students' Attitudes Toward Learning Mathematics

Teachers play a critical role in shaping students' attitudes toward mathematics through their instructional methods and classroom interactions. Research indicates that traditional teaching practices often favor male students, creating a "chilly climate" for girls in mathematics classrooms (Sandler, 1982). Teachers, often unconsciously, give more attention to male students, assuming that participation signifies engagement and learning. Pask (1976), found that as boys grow older, they increasingly dominate classroom discussions, speaking up to 12 times longer than girls. This gendered classroom dynamic may contribute to the perception that mathematics is a male-dominated subject, discouraging female students from active participation.

Additionally, differences in classroom behavior reinforce gender stereotypes, further influencing teachers' perceptions of students' mathematical abilities. Female students tend to ask more questions, acknowledge peers' contributions, and avoid interrupting discussions behaviors that align with traditional gender roles but may lead teachers to perceive them as less confident in the subject (Sadler, 1982). This lack of assertiveness can cause

teachers to unconsciously lower their expectations for female students, which in turn affects the students' confidence and willingness to engage in mathematics learning. Chauhamas (1978), emphasize that anticipation of negative outcomes inhibits effort and engagement, meaning that when students believe they will struggle with mathematics, they are less likely to persist in learning the subject.

A national survey in Kenya further highlights the role of teachers in shaping students' attitudes toward mathematics (Wesonga, 1996). The study found that when students struggle with the subject and seek help, some teachers simply refer them to textbooks instead of offering guidance, making mathematics feel even more difficult. Furthermore, Bosire (1997) observed that male teachers often exclude girls from classroom activities, such as answering questions or conducting experiments, reinforcing gender biases in mathematics education. Given these findings, this study examines how students' perceptions of teacher expectations influenced their attitudes toward mathematics in Keiyo District between 2001 and 2004, particularly in relation to gender disparities in participation and performance.

6. RESEARCH METHODOLOGY

6.1. Research Design

The study employed an exploratory approach using a descriptive survey design to examine gender differences and attitudes toward learning mathematics among secondary school students. Descriptive surveys, as noted by Cohen et al. (1994), are useful for gathering, summarizing, and interpreting information in exploratory studies. Orodho (2002) highlight that such designs help generate statistical insights relevant to education policy and practice. This study specifically adopted an ex-post facto design, where variables were not manipulated but observed under existing conditions.

According to Kerlinger (1983), an ex-post facto design is:

> *"Systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manipulations have already occurred or because they are inherently not manipulable. Inferences about relations among variables are made without direct intervention from concomitant variation of independent and dependent variables."*

Although ex-post facto research has some limitations, it is widely used in social sciences and education, where experimental manipulation is often impractical (Kerlinger, 1983). In this study, the only control applied was limiting responses to a specific category of Form Three students in selected schools to ensure consistency in data collection.

6.2. Study Area and Population

The study was conducted among secondary school students and mathematics teachers in Keiyo District, Rift Valley Province, Kenya. Keiyo District was chosen due to its accessibility to the researcher, a student at Moi University, Eldoret. Additionally, an analysis of KCSE mathematics results (2001–2003) revealed a consistent performance gap between boys and girls at the national level. In 2002, boys achieved a mean score of 22.53%, while girls scored 16.44%. Similarly, from 2001 to 2003, boys had a mean score of 22.10% compared to 16.05% for girls (see Table 2). A similar trend was observed in Keiyo District, where boys outperformed girls in mathematics (see Table 4).

Given that mathematics performance is often linked to students' attitudes and perceptions of their teachers' expectations, this study focused on Form Three students and mathematics teachers, who play a crucial role in shaping students' mathematical confidence and motivation. The lack of documented studies on gender differences in attitudes toward mathematics in Keiyo District highlighted a research gap. This study aimed to investigate whether students' perceptions of teacher expectations influenced their attitudes toward learning mathematics, particularly in the context of gender disparities.

6.3. Sampling and Sample Size

The study surveyed Form Three students and mathematics teachers from selected secondary schools in Keiyo District. Schools were stratified by gender composition into boys' schools, girls' schools, and mixed schools, after which 50% of the schools from each category were randomly selected (6 mixed schools, 5 boys' schools, and 4 girls' schools). In schools with multiple streams, one class was chosen randomly, and 20 students per class were selected using simple random sampling. Additionally, mathematics teachers were selected through convenient sampling for interviews. The final sample included 300 students (150 boys and 150 girls) and 15 mathematics teachers (5 female and 10 male).

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6.4. Data Collection Instruments

Data was gathered using researcher-designed questionnaires and interview schedules. The researcher developed two types of questionnaires after reviewing those designed by Suzan (1980) and Jepkoech (2002). Questionnaires were chosen for their ability to efficiently collect data from large samples while allowing respondents ample time to provide well-thought-out answers.

6.4.1. Questionnaires and Interviews

The Teachers' Questionnaires focused on teachers' opinions regarding the relationship between gender and mathematics performance, as well as their perceptions of students' learning experiences. The Students' Questionnaires were divided into three sections: the first assessed students' feelings toward learning mathematics, while the other two gathered background information, including parental occupation and perceptions of peer, parental, and teacher expectations. Additionally, face-to-face interviews were conducted with 15 teachers and 60 randomly selected students to gain deeper insights into teachers' perceptions of students' attitudes and students' perspectives on learning mathematics.

6.4.2. Data Collection Procedures

Approval for the study was obtained from the Office of the President through the School of Graduate Studies, Moi University, and the District Commissioner's office. School head teachers were then contacted, informed of the study's purpose, and their consent was secured. The researcher coordinated with Heads of Mathematics Departments (HODs) for questionnaire distribution. Teachers' questionnaires were left with the HODs for later collection, while students' questionnaires were administered directly by the researcher to ensure a high response rate (over 90%). Formal interviews with 15 teachers (10 male, 5 female) and 60 students (30 boys, 30 girls) were conducted as planned.

6.4.3. Validity and Reliability of Data Collection Instruments

The questionnaires were pre-tested through a pilot study at Lelmolok Secondary School in Uasin Gishu District, Kenya, involving 20 students (10 boys, 10 girls) and 2 mathematics teachers (1 male, 1 female). Reliability was assessed using the split-half technique, where responses were divided into odd (X) and even (Y) items, and Pearson Product-Moment Correlation was applied. The computed reliability coefficients were 0.824 for students' questionnaires and 0.947 for teachers' questionnaires, both deemed reliable. Content validity was ensured through expert review by two specialists in Educational Communication and Technology at Moi University, whose feedback was incorporated to refine the research instruments.

6.5. Data Analysis Technique

The collected data was analyzed using descriptive and inferential statistics with the help of SPSS and Microsoft Excel. Responses from the questionnaires were scored using a Likert scale, where positive items ranged from five to one and negative items from one to five. In descriptive statistics, frequencies and percentages were used to summarize the data, while Chi-square (χ^2) tests were applied in inferential statistics to determine whether there were significant differences between the observed and expected frequencies of selected variables.

The Chi-square (χ^2) test was computed by subtracting the expected frequency (fe) from the observed frequency (fo), squaring the difference, dividing by the expected frequency, and summing the values across all categories. The test was used to measure the relationship between variables and assess the validity of the null hypothesis (H_0). To determine the strength of associations, the coefficient of contingency (C) was calculated. In interpreting the results, if the computed χ^2 value was less than the critical χ^2 value at a 0.05 significance level, the null hypothesis was accepted, indicating no significant relationship between variables. Conversely, if the computed χ^2 value was greater than the critical value, the null hypothesis was rejected, suggesting a significant difference between observed and expected frequencies.

7. RESULTS AND DISCUSSION

7.1. Students' Perception of Teachers' Expectations and Students Attitudes towards Learning of Mathematics:

Ho_1: There is no significant relationship between students' perception of teacher's expectations and their attitudes towards learning of mathematics.

To test this hypothesis, students' perception of teachers' expectations were categorized into two aspects. These were: (a) perceptions of what teachers expect mathematics students to achieve, and (b) teachers' willingness to assist them in learning of mathematics. Each aspect was analyzed using percentages and Chi-square technique.

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7.2. Mathematical Expectation by the Teachers:

Table 5 shows the percentages for students' attitudes towards learning of mathematics and their mathematical expectations by the teacher.

From Table 5, it can be seen that majority of the respondents with positive attitudes (i.e. 50 %) perceived that their teachers were optimistic they would pass in mathematics while 20% of students who also had positive attitudes were perceived by their teachers that they would not pass. On the other hand, the students with negative attitudes [i.e. 10% from those who will pass and 10% from those who will not pass] were perceived by their teachers to be pessimistic about their passing of mathematics.

A significant difference was found between students' perception of teachers' expectations and their attitudes towards learning of mathematics. This was realized through the χ^2calculated value of 9.6429 which was greater than the χ^2 critical of 5.99 at 2df and 0.05 level of significance. However, the above percentages show that the students' perception of their performance expectations by the teacher influences the attitudes towards learning of mathematics.

In conclusion, the students' attitudes towards the learning of mathematics are significantly related to their perception of their performance as expected by their teachers. A contingency coefficient of 0.1765 was obtained which showed an existence of a relationship between the two variables.

Table 5. Teachers' Expectations and Students' Attitudes towards Learning of Mathematics.

TEACHERS EXPECTATIONS ON PERFORMANCE	STUDENTS' ATTITUDES			
	POSITIVE	NEUTRAL	NEGATIVE	TOTAL
Will pass	150 (50%)	20 (6.7%)	30 (10%)	200 (66.7%)
Will not pass	60 (20%)	10 (3.3%)	30 (10%)	100 (33.3%)
Total	210 (70%)	30 (10%)	60 (20%)	300 (100%)

$\chi^2_{calculated} = 9.643$, $\chi^2_{critical} = 5.99$, df = 2, C = 0.177, P < 0.05

Table 6 shows the percentages for girls' perception of their performance expected by the teachers and their attitudes towards learning of mathematics according to their gender. While Table 7 shows the percentages for boys' perception of their performance expected by the teacher and their attitudes towards learning of mathematics according to their gender.

The findings show that more boys than girls (74% compared to 59.3%) perceived their teachers' to expect a better performance in mathematics while more girls than boys (40.7% compared to 26%) perceived their teachers to expect poor performance in mathematics. Further, the results show that attitudinally, more boys were positively inclined compared to girls in perceiving their teachers to expect better performance in mathematics (50.7% compared to 49.3%) though more boys (12.7%) had negative attitudes than girls (7.3%).

The results for the girls tend to be exceptional when a good number perceived their teachers to expect poor performances due their dislike for their mathematics teachers or the school. These findings agree with those of Mahlomaholo et al. (2003) but contradict those of Owiti (2001).

A Chi-square test for any significant relationship between the perceived expected performance by the teacher and attitudes according to gender were calculated. The χ^2calculated values were 6.1457 for girls and 22.4869 for boys which were both greater than the χ^2 critical value of 5.99 at df = 2 and at 0.05 level of significance.

This led to the rejection of the hypothesis that "there is no significant relationship between boys' attitudes towards learning of mathematics and their perceived performance by their teachers in mathematics". A similar hypothesis for girls was also rejected. The conclusion was that girls' and boys' attitudes are significantly related to their perception of performance expected by the teacher. From a further inspection of data, it can also be noted that the relationship between attitudes and perceived performance of the students by their teachers was more pronounced as shown by the calculated contingency coefficient of 0.153 for girls and 0.362 for boys. This shows a low degree of association between girls' attitudes and perceived performance by their teachers and a slightly higher degree of association between boys' attitudes and perceived performance by their teachers.

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Table 6 Teachers' Expectations and Girls' Attitudes towards Learning of Mathematics.

TEACHERS EXPECTATIONS ON PERFORMANCE	STUDENTS' ATTITUDES			
	POSITIVE	NEUTRAL	NEGATIVE	TOTAL
Will pass	74 (49.3%)	2 (1.3%)	13 (8.7%)	89 (59.3%)
Will not pass	43 (28.7%)	7 (4.7%)	11 (7.3%)	61 (40.7%)
Total	117 (78%)	9 (6%)	24 (16%)	150 (100%)

$\chi^2_{calculated} = 6.1457$, $\chi^2_{critical} = 5.99$, df = 2, C = 0.153, P < 0.05

Table 7 Teachers' Expectations and Boys' Attitudes towards Learning of Mathematics.

TEACHERS EXPECTATIONS ON PERFORMANCE	STUDENTS' ATTITUDES			
	POSITIVE	NEUTRAL	NEGATIVE	TOTAL
Will pass	76 (50.7%)	18 (12%)	17 (11.3%)	111 (74%)
Will not pass	17 (11.3%)	3 (2%)	19 (12.7%)	39 (26%)
Total	93 (62%)	21 (14%)	36 (24%)	150 (100%)

$\chi^2_{calculated} = 22.4869$, $\chi^2_{critical} = 5.99$, df = 2, C = 0.362, P < 0.05

7.3. Teachers' Willingness to Assist Students in Learning of Mathematics

Table 8 shows the percentages of students who perceived their teachers to be willing or not willing to assist them in learning of mathematics against their attitudes towards learning of mathematics. Majority of the students with positive attitudes (i.e. 84.7% as compared to 10%) perceived the teachers to be ready to assist in learning of mathematics while minority of the students with negative attitudes (1.7% compared to 2.6%) perceived the teachers to be unwilling to take time to assist in mathematics. The percentages show that majority of the students with positive attitudes perceived teachers to be willing to assist them while the minority who had negative attitudes perceived their teachers to be unwilling to assist in mathematics.

A chi-square (χ^2) was computed to see if there was any significant difference in attitudes among students who perceived teachers to be willing to set time to assist them and also those who perceived teachers to be unwilling to set aside time to assist them. The χ^2calculated value obtained was 9.604. This was greater than the χ^2 critical value of 5.99 at df = 2 and 0.05 level of significance. This led to the rejection of the hypothesis "There is no significant relationship between perception of teachers' willingness to set time to assist in learning of mathematics and the students' attitude towards the subject".

In conclusion, students' attitudes towards mathematics are significantly related to their perception of teachers' willingness to assist them in mathematics. This result was further ascertained by a contingency coefficient of 0.1769 which pointed to the existence of a weak relationship between the two variables.

Table 8 Teachers' Willingness to Assist Students in Mathematics and Students' Attitudes towards Learning of Mathematics.

TEACHERS WILLINGNESS TO ASSIST IN MATHEMATICS	STUDENTS' ATTITUDES			
	POSITIVE	NEUTRAL	NEGATIVE	TOTAL
Willing	254 (84.7%)	2 (0.7%)	8 (2.6%)	264 (88%)
Not Willing	30 (10%)	1 (0.3%)	5 (1.7%)	36 (12%)
Total	284 (94.7%)	3 (1.0%)	13 (4.3%)	300 (100%)

$\chi^2_{calculated} = 9.6904$, $\chi^2_{critical} = 5.99$, df = 2, C = 0.1769, P < 0.05

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Table 9 shows the percentages of girls who perceived their teachers to be willing or not willing to assist in learning of mathematics against their attitudes. It reveals that 78.7% of the girls perceived their teachers to be willing to assist them. On the other hand, 21.3% of the girls perceived that their teachers were unwilling to assist them in mathematics. Majority of the girls (74.7%) had positive attitudes compared to 3.3% who had negative attitudes and perceived that their teachers were willing to assist. It can also be noted that 18.6% of them had positive attitudes while 2% had negative attitudes and perceived that their teachers were not willing to assist.

Table 10 shows the percentages of boys who perceived their teachers to be willing or not willing to assist in learning of mathematics against their attitudes. It reveals that 97.4% of the boys perceived their teachers to be willing to assist them. On the other hand, 2.6% of the boys perceived that their teachers were unwilling to assist them in mathematics. As well 94.7% of the boys had positive attitudes while 2% had negative attitudes and perceived that their teachers were willing to assist. Similarly, 1.3% of them had positive attitudes while 1.3% had negative attitudes and perceived that their teachers were not willing to assist.

From the above findings, it can be seen that amongst students who had positive attitudes, more boys than girls perceived that their teachers were willing to assist them. Amongst the students who had negative attitudes towards learning of mathematics on the other hand, more girls than boys perceived that their teachers were unwilling to assist them.

When Chi-squares (χ^2) were calculated to assess the significance of differences in attitudes among boys and girls, values 2.085 for girls and 28.524 for boys were obtained. The χ^2 calculated value for girls was less than the χ^2 critical value 5.99 tabulated at df = 2 and at 0.05 level of significance while that of boys was greater than the same critical value which was also tabulated at a similar level of significance. It implies that the hypothesis "there is no significant relationship between girls' perception of teachers' willingness to assist and girls attitudes towards mathematics", was accepted.

On the other hand, the hypothesis "there is no significant relationship between boys' perception of teachers' willingness to assist and boys attitudes towards mathematics" was rejected.

It was concluded that girls' attitudes towards mathematics are not significantly influenced by their perception of teachers' willingness to assist them in mathematics compared to the boys' attitudes which showed that they are significantly influenced by their teachers' willingness to assist them in mathematics. The contingency coefficients for the girls (0.0974) and for boys (0.3997) further confirmed this finding. The table shows that the relationship between the students' attitudes and their perception of teachers' willingness to assist in mathematics is more pronounced for boys than for girls. This could possibly be pointing to the fact that teachers tend to ignore girls, a possible contribution to the nature of girls attitudes towards learning of mathematics (Fennema, 1996).

Table 9 Teachers' Willingness to Assist in Mathematics and Girls' Attitudes towards Learning of Mathematics.

	STUDENTS' ATTITUDES			
	POSITIVE	**NEUTRAL**	**NEGATIVE**	**TOTAL**
Willing	112 (74.7%)	1 (0.7%)	5 (3.3%)	118 (78.7%)
Not Willing	28 (18.6%)	1 (0.7%)	3 (2.0%)	32 (21.3%)
Total	140 (93.3%)	2 (1.4%)	8 (5.3%)	150 (100%)

$\chi^2_{calculated} = 2.085$, $\chi^2_{critical} = 5.99$, df = 2, C = 0.0974, P < 0.05

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Table 10 Teachers' Willingness to Assist in Mathematics and Boys' Attitudes towards Learning of Mathematics.

	STUDENTS' ATTITUDES			
	POSITIVE	**NEUTRAL**	**NEGATIVE**	**TOTAL**
Willing	142 (94.7%)	1 (0.7%)	3 (2%)	146 (97.4%)
Not Willing	2 (1.3%)	0 (0%)	2 (1.3%)	4 (2.6%)
Total	144 (96%)	1 (0.7%)	5 (3.3%)	150 (100%)

$\chi^2_{calculated} = 28.524$, $\chi^2_{critical} = 5.99$, df = 2, C = 0.3997, P < 0.05

7.4. Interview Findings on Students' Perceptions of Teacher Expectations

Interviews with teachers and students revealed that teacher expectations significantly influence students' attitudes toward learning mathematics. Many teachers admitted to having higher expectations for boys than for girls, citing that boys participated more actively in class and appeared more confident. When asked about gender differences in mathematics performance, 10 out of 15 teachers (67.7%) stated that girls lacked confidence, were apologetic, and did not take mathematics seriously. Some teachers also believed that even if girls received equal support, they would still struggle with the subject. Additionally, 3 out of 5 female teachers (60%) noted that societal influences and parental reinforcement contributed to gender-based differences in student attitudes.

Students' responses reflected these perceptions. A majority of male students (60%) indicated that their teachers' encouragement motivated them to work harder in mathematics. In contrast, several female students expressed feeling overlooked, stating that their teachers assumed they would struggle with the subject. 25 out of 30 male students (83.3%) and 18 out of 30 female students (60%) reported that their parents were concerned about their attitudes toward mathematics, further reinforcing external expectations. Additionally, 40 out of 60 students (66.7%) acknowledged a difference between finding mathematics useful and actually enjoying it, with 33.3% of female students stating they would enjoy mathematics more if they saw its practical applications.

Overall, the findings indicate that students' perceptions of teacher expectations directly impact their motivation and confidence in mathematics. When students feel that their teachers believe in their abilities, they are more likely to develop a positive attitude and perform better. However, when they perceive lower expectations, they may lose motivation, reinforcing existing gender disparities in mathematics achievement.

SUMMARY AND CONCLUSION

The results of the Chi-square analysis revealed a significant relationship between students' perceptions of teachers' expectations and their attitudes toward learning mathematics. The calculated χ^2 value exceeded the critical χ^2 value at df = 2, tabulated at a 0.05 level of significance, leading to the rejection of the null hypothesis. This indicates that students' attitudes toward mathematics are strongly influenced by how they perceive their teachers' expectations. However, these findings do not fully align with Peterson et al. (1985) study, which argue that traditional teaching practices and classroom discourse often disadvantage female students. Their research suggests that a "chilly climate" in mathematics classrooms, shaped by norms favoring male students, leads to lower self-esteem and participation among girls.

Further analysis of gender-specific attitudes and teacher expectations revealed that teachers' willingness to assist students had a significant impact on both boys' and girls' attitudes toward mathematics. However, when examined separately for each gender, the results showed that teacher expectations had a more pronounced effect on boys than on girls. These findings are consistent with Tambari (1999), who found that teachers tend to interact more frequently with boys, offering them more praise, scolding, and engagement in the classroom. This aligns with Beal (1994), who argues that the frequency, duration, and content of teacher-student interactions vary between boys and girls, ultimately shaping their self-perceptions and relationships with academic disciplines.

The study concludes that teachers generally hold higher expectations for boys than for girls, which influences their level of interaction with each gender. As a result, boys receive more encouragement and engagement in mathematics, while girls may experience less reinforcement, potentially leading to lower confidence and interest in the subject. These findings highlight the critical role of teacher expectations in shaping students' attitudes and performance in mathematics, reinforcing the need for equitable classroom practices that support both genders.

RECOMMENDATIONS

Mathematics teachers should be encouraged to adopt gender-inclusive teaching strategies that foster positive attitudes among both boys and girls. Schools should sensitize teachers on the impact of their expectations on students' confidence and performance, ensuring they provide equal encouragement and support to all learners. Teachers should avoid derogatory comments or unconscious biases that may discourage female students from engaging with mathematics, as such perceptions can negatively influence students' self-belief and motivation. Additionally, teachers should actively praise and support students who struggle with mathematics, ensuring that they feel capable of improving through effort rather than viewing mathematical ability as an inborn trait. To create a more engaging and inclusive learning environment, schools should establish mathematics clubs and laboratories, where students of both genders can interact and develop interest in the subject beyond the classroom setting. Teachers should also be trained on gender-responsive pedagogy, enabling them to recognize and address gender disparities in mathematics education. Furthermore, career counselors should be trained to eliminate gender biases in subject selection and career guidance, ensuring that girls are encouraged to pursue mathematics-related fields. By implementing these strategies, teachers can play a transformative role in shaping students' perceptions, fostering confidence, and promoting equal opportunities for boys and girls in mathematics learning.

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