

Research Article

Gender Differences in School Adjustment, Academic Mindset, Social Belonging, and Mathematics Achievement Among Kenyan Secondary School Students

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Abstract

Background: Mathematics is the foundation of all forms of knowledge. Globally, mathematical ability is the cornerstone of innovation and technology. Despite its importance, poor mathematics achievement continues to be a matter of concern among education stakeholders, as students are forced to enroll in courses with uncertain career prospects and values. **Objectives:** This study, therefore, sought to investigate gender differences in school adjustment, academic mindset beliefs, social belonging, and mathematics achievement among Form Three students in Kajiado County, Kenya. **Methods:** This study used a correlational research design with a targeted population of all Form Three students enrolled in Kajiado County. A three hundred and ninety (390) secondary school students constituted the sample. The purposive sampling technique was used to select ten (10) schools in the County, the stratified sampling technique was used to select schools from various categories, and simple random sampling was used to select 390 students from the ten schools. The instrument used for data collection was modified from the Student Adaptation to College Questionnaire (SACQ) ($r=0.85$), Implicit Theories of Intelligence Scale ($r=0.86$), and Psychological Sense of School Membership Scale ($r=0.85$). Additionally, the participants' academic records provided data on their mathematics achievements. Gender differences were tested using the Independent Samples *t*-test. **Results:** The results showed no statistically significant gender disparities in students' school adjustment, academic mindset beliefs, or social belonging. However, gender differences were noted in the study variables' specific domains, with male students reporting higher academic adjustment, malleable mindsets, and feelings of rejection than female students. Conversely, no significant gender differences were noted in the social, emotional, and institutional adjustment dimensions. The study recommends that school authorities organize educational programs to raise awareness of school adjustment, malleable beliefs, and feelings of belonging in both boys and girls. **Conclusion:** Overall, gender differences play an important role in school adjustment, academic mindset, and social belonging in relation to students' mathematics outcomes. Therefore, it is important to focus on different genders when applying interventions aimed at enhancing mathematics achievement among secondary school students.

Keywords

School Adjustment, Academic Mindset Beliefs, Social Belonging, Mathematics Achievement, Gender Differences

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1. Introduction

Mathematical abilities are the cornerstone of innovation and technology worldwide. Mathematics is a basic subject for studying other academic fields, such as science, technology, and engineering, as well as non-scientific fields, such as accounting, music, and art, which are essential for nurturing creative and innovative experts in a country. A nation requires highly trained and talented experts to drive innovation and development in various fields. Globally, nations striving for economic progress place a premium on mathematics achievements. Chand et al. [8] stated that mastery of mathematics is necessary for occupations requiring investigative, logical, critical, and analytical skills. Mathematical literacy is required for anyone seeking to progress in their profession or enter the workforce [10].

Despite the great value that society places on mathematics, poor mathematical performance in examinations continues to worry education stakeholders. Globally, general disinterest in mathematics has been a persistent problem at all educational levels in both developing and developed countries. According to the National Assessment of Education Progress (NAEP), poor mathematics achievement in grades 4 and 8 in the United States depends on race, ethnicity, and socioeconomic class, in addition to ability and linguistic background level [21]. There is also strong evidence of a decline in interest in the subject in Australia, where mathematics is linked to a culturally fixed mindset [33]. Maamin et al. [27] clarified that a variety of factors, including students, families, instructors, schools, and policymakers, impact mathematics achievement in the Association of Southeast Asian Nations (ASEAN).

Poor mathematical achievement has been the subject of inquiry in several African nations, particularly in South Africa, Ghana, Tanzania, and Kenya. [45] discovered that fifth-grade students in South Africa perform poorly in math. Mabena et al. [28] propose that students' negative beliefs toward mathematics may be caused by a lack of enthusiasm for the subject. Studies have revealed that students in Ghana, like those in the majority of other African nations, often voice their dislike of and lack of interest in mathematics during their studies [4, 2]. According to certain studies, Tanzanian students' performance in mathematics is adversely affected by their attitude [32]. Kenya is not exempt from poor mathematics achievement, which has attracted the attention of education stakeholders and researchers. A report from the Kenya National Examinations Council indicated a grand mean score of less than 35% with the female candidates below 30% (KNEC, 2024) [25]. This low achievement in mathematics performance and gender disparities is partly attributed to ineffective school adjustment, academic mindset beliefs, and social belonging [30, 43, 12]. The persistent poor performance in mathematics and gender disparities is also registered in Kajiado County, indicating that the performance index for females was below 3 points out of 12 points for three consecutive years, as compared to males with above 4 points

[24]. Researchers have identified several factors associated with poor mathematics achievement, but the current study focused on gender differences in school adjustment, academic mindset beliefs, and social belonging.

Adjustment is a fundamental concept for understanding how individuals cope with challenges in school life. School adjustment refers to students' capacity to sustain their attitudes, actions, and feelings in the face of evolving, novel, or ambiguous academic demands [11]. It includes social, emotional, academic, and attachment skills [5]. Social adjustment is associated with navigating relationships and social environments [35]. In contrast, emotional adjustment refers to emotional states used to regulate feelings in response to different situations. Moreover, academic adjustment refers to the various learning requirements of the classroom, whereas institutional adjustment refers to content with general and specific educational experiences [5]. Related research has found links between teacher and student interactions, school adjustment, and academic achievement by gender [48, 37, 1, 19].

More importantly, academic mindset beliefs are another construct related to mathematics achievement. According to Dweck [15], academic mindset encompasses two primary categories of student mindset beliefs: malleable and fixed. The use of malleable mindsets suggests that intelligence can be developed through knowledge and training, indicating that personal efforts can improve abilities. This belief prioritizes mathematics tasks because they are considered interesting and worthwhile. A fixed mindset is based on the belief that certain individuals are naturally strong in mathematics and science, while others are not. These individuals shy away from challenges that they believe could expose their "permanent" shortcomings, dislike effort, which they believe indicates a lack of ability, and give up more quickly when faced

come performance anxiety, and perform better [3]. Students with feelings of belonging at school are better equipped to handle loneliness, performance pressure, school stress, and poor academic performance. Research conducted in Kenya has shown that academic achievement is positively correlated with student attitudes, gender, adaptability, academic mindset, feelings of belonging, and teacher credentials [36, 6, 34]. Additional research in this field has established a significant relationship between gender, adjustment, belonging, attachment type, and overall academic achievement [41].

Poor mathematics achievement is often associated with a negative learning environment that promotes gender-stereotyped messages. However, mathematics reforms in Kenya are skewed towards areas that exclude the interaction between gender in relation to school adjustment, academic mindset beliefs, and social belonging. Ensuring students' success in mathematics is a shared responsibility among stakeholders, but much depends on the individual student and, more so, their gender. This implies that individual students need to adjust to school with the mindset of socially belonging on their own to position themselves well for academic excellence. Students use school adjustment, academic mindset beliefs, and social belonging to overcome feelings of rejection and reduce the detrimental effects of stress and threats in a stereotyped environment. However, very few studies have explored gender differences in relation to school adjustment (social, emotional, academic, and institutional), academic mindset beliefs (fixed vs. malleable), social belonging (rejection vs. belonging), and their role in students' mathematics achievement. This gap is what this study aimed to address.

2. Literature

This study attempted to explain the gender differences in school adjustment, academic mindset beliefs, social belonging, and mathematics achievement. The literature has identified gender disparities in school adjustment. In China, Yau et al. [49] surveyed 265 students from five universities in Hong Kong. This study aimed to ascertain the existence of gender differences in perceptions of the connections between academic, social, and psychological adjustment during the transition phase. The findings of this study suggested that female students believe that they adjust to social situations more successfully than their male counterparts. Nonetheless, female students believe that psychological adjustment is more closely related to academic adjustment than male students. However, the linear regression models could not identify gender differences in the association between students' psychological and social adjustment. Findings regarding adjustment, gender, and residence were replicated in a different study that surveyed 471 students (234 boys and 237 girls) randomly drawn from eight secondary schools in Purulia, India [38]. The researchers categorized the students as those living in urban and rural areas. Cumulatively, the findings lead to the conclusion that girls ($M = 91.61$, $SD = 12.81$) were

better adjusted than boys ($M = 87.72$, $SD = 13.73$; $t = 3.18$, $p < .05$). However, there was no significant difference in adjustment between urban and rural students. The current study attempted to build on the results obtained in China and India to determine whether the results would be replicated in a different socio-cultural setting.

Kaur and Sharma [23] revealed gender differences, with girls reporting better adjustment than boys. This is in contrast to other studies carried out in Africa, which found no significant gender difference in school adjustment, but males scored higher than females on social adjustment, which was the primary driver of the change in relationships. A study in South Africa posits that academic and social adjustment appear to have a positive impact on boys in a competitive university environment; however, the high dropout rates among girls who struggle to adjust are difficult to reverse [35]. In their cross-sectional cohort design study on a sample of 221 students in grades 3 and 4 in South Africa (44.34% girls, 55.66% boys), De Waal et al. [13] reported gender differences, with more females taking math courses than males.

Some studies conducted in the USA have found no gender differences in students' mindset beliefs. For example, Macnamara and Rupani [29] examined the connection between mindset and IQ in 103 general psychology students (57 of whom were female) at Case Western University in the United States. The mean age was 18.95 years ($SD = 1.82$). Contrary to popular belief, the study revealed no indication that women had a more fixed attitude than men. The study showed little indication of a "brighter woman effect," which holds that brilliant women have more fixed

developmental mindset scores [40]. This subtly demonstrates that research on gender variations in academic mentality views remains inconclusive and requires further investigation.

Gender affects perceptions of IQ and feelings of insecurity regarding belonging. For instance, in a correlational study of 1291 STEM university students in Germany (18% female, 82% male), Deiglmayr et al. [12] found a substantial difference between the beliefs of male ($r=.19$; $p<.01$) and female students ($r=.18$; $p<.01$) regarding brilliance and belonging ambiguity. However, female students reported higher levels of brilliance ($\beta=.79$; $p<.01$) and higher levels of belonging uncertainty ($\beta=.79$; $p<.01$). This study shows that belonging uncertainty arises because people believe that success in their field depends on fixed abilities and the actual ability they possess for success. In their study on the relationship between physical performance and physical intellectual attitude, Malespina et al. [31] examined 781 students (36% female and 64% male) at the University of Pittsburgh in the United States. However, they reported conflicting results using a mindset survey validated by other researchers [26]. The results of the survey research design revealed no gender differences in any aspect of attitude, except for aptitude at the start of the course ($X^2 = 3.49$, $SD = 5.2$ for males; $X^2 = 3.32$, $SD = .46$ for women, $p<.01$, $d = .37$). Although the average GPA of the female participants was greater than that of the male participants, the average course grade for the female participants ($X^2 = 2.49$, $SD = .90$) was somewhat lower than that of the male participants ($X^2 = 2.76$, $SD = .98$). The study established that female physics students have a low sense of belonging, and such differences arise from negative messages that endorse stereotypes and fixed mindsets.

Related research has focused on the differences between gender stereotypes and mathematics achievement. To investigate the connection between mathematical achievement and gender stereotype threat, Maduagwu et al. [30] selected 402 secondary school students from Nigerian public schools (199 males and 203 females). Data were gathered using the Mathematics Achievement Test (MAT) and the Gender Stereotype Threat Scale (GSTS). This study found a negative correlation between arithmetic achievement and gender stereotype threat ($r = -.28$, $p<.05$). The study also revealed a significant difference between the two groups, with male students ($X^2 = 22.2$, $SD = 5.2$) being more at risk from gender stereotypes than female students ($X^2 = 17.5$, $SD = 5.2$, $p<.01$, $d = .97$). However, male and female students who were not exposed to fear of gender stereotypes did not significantly differ in their achievement. The study also showed that gender matters, with female students showing higher scores in mathematics ($X^2 = 41.1$, $SD = 20.6$, $p<.01$, $d = .34$) than males ($X^2 = 39.5$, $SD = 17$). These data demonstrate a relationship between gender and mathematics, despite their weak association.

The literature includes a number of studies that contradict

one another regarding the connection between mathematical proficiency and gender. One set of studies noted differences between males and females, whereas others found no difference in mathematics achievements. In a mixed-methods study of 52 English primary school students (24 girls and 28 boys), Webb-Williams et al. [46] discovered that there were notable gender disparities in society and that boys performed worse on the achievement scale than girls. Some studies, such as Igbo et al. [22], have shown that males outperform females in mathematics. In a similar vein, Flore et al. [17] studied 2064 students in the Netherlands and revealed that gender significantly predicted performance, with boys outperforming girls. This study demonstrated that rather than a lack of intellectual aptitude, gender preconceptions cause people to lose confidence in women.

Research on how gender affects social affiliation in Kenya is limited,

Table 1. Participants' characteristics.

	School type			Total
	GB	BB	COED	
Boys	-	72 (23.5%)	93 (30.3%)	165 (53.8%)
Girls	96 (31.2%)	-	46 (15%)	142 (46.2%)
Total	96 (31.2%)	72 (23.5%)	139 (45.3%)	307 (100%)

Note. N = 307; BB = boys boarding; GB = girls boarding; CO-ED = Co-educational day; () = percentage of total.

Procedures

The questionnaires were distributed to various categories of secondary school students in the County. Self-reported questionnaires were distributed to the participants to complete. They were first informed of the study's overall goals, sample characteristics, and confidentiality procedures. There was no payment for involvement; all participants completed the questionnaires voluntarily and were assured of their anonymity. They were also informed that they could withdraw from the study at any time. Finally, they were told how to get in touch with them regarding any questions they might have or the results once the study was completed.

This study complied fully with the guidelines set forth by the authors' university Graduate School and the National Commission of Science, Technology, and Innovation (NA-COSTI) codes of ethics. In the current study, all participants provided written informed consent to participate in the study. Every participant in the data coding process was assigned a digit between 1 and 390.

Sampling Strategy

Purposive sampling was used to select the county, form three students, and 10 schools. Stratified sampling was used to select schools from various categories: boys' boarding (2), girls' boarding (3), and coeducational schools (5). Simple random sampling was used to select 390 participants from the schools.

Materials

Demographics

Participants were asked to respond to two demographic questions (gender and school type).

The School Adjustment Measures

The Student Adaptation to College Questionnaire [5] was used to gauge students' degree of school adjustment. The sixty-seven items on this self-reported questionnaire examine school adjustment as a multidimensional construct using four subscales. The social subscale (questions such as "*I meet and make as many friends as I would like at school*") asks about participants' social environment, other people, and nostalgia. One of the questions in the emotional subscale, "*I have been feeling nervous recently*," gauges the participant's psychological and physical state. The academic adjustment subscale assesses participants' motivation, application, performance,

and academic environment (24 items such as "*I am not working as I should during my academic work*"). The institutional adjustment asks about participants' relationship with this school (questions such as "*I am pleased*

people subscale (three items), the students' subscale (two items), the teachers' subscale (four items), and the self-subscale (four items). In the current study, the five subscales were condensed into two: the feelings of rejection subscale and the feelings of belonging subscale, by obtaining the average score of the two subscales [16]. The 13 items in the feelings of rejection subscale, such as *"It is difficult for people like me to be accepted at my school,"* gauge an individual's level of personal relationships, including acceptance, inclusion, and welcome. Feelings of rejection assess an individual's degree of rejection, exclusion, or being ignored. Participants rated themselves on a 6-point Likert scale, with 1 denoting "not at all true" and 6 denoting "completely true." After reverse coding the negative questions, social belonging was calculated by adding all the responses; for low, moderate, and high social belonging, the ranges were 18-36, 36.1-72, and 72.1-108, respectively.

Measure of Mathematics Achievement

Mathematics achievement was measured with one question requiring participants to complete a pro forma table embedded in the questionnaire regarding grades for the 2024 midterm and end-of-first-term exams. The Statistics Package for Social Sciences (SPSS) was used to enter and calculate the mean score and total number of marks in mathematics. To guarantee a fair comparison across the ten sampled schools for the study, these scores were first converted into standard Z-scores and then into T-scores using SPSS [7].

Statistical Analysis

This study aimed to determine whether students' school adjustment, academic mindset beliefs, social belonging, and mathematical achievement differed significantly by gender. To accomplish this goal, the following null hypothesis was proposed:

H₀₁: There are no significant gender differences in school adjustment, academic mindset beliefs, social belonging, and mathematics achievement. To test this hypothesis, the following four supplementary hypotheses were proposed:

H₀₁. 1: Gender differences in school adjustment are not statistically significant.

H₀₁. 2: Gender differences in academic mindset beliefs are not statistically significant.

H₀₁. 3: Gender differences in social belonging are not statistically significant.

H₀₁. 4: Gender differences in mathematics achievement are not statistically significant.

Statistical Test: Independent sample *t*-test.

4. Results

Gender Differences in School Adjustment, Academic Mindset, and Social Belonging Descriptive Results

Table 2. Mean Differences in School Adjustment Levels.

Variable	Gender			
	Male		Female	
	M	SD	M	SD
Academic Adjustment (AA)	81.8			

with additional elements such as bullying or taunting, which can cause them to avoid school attendance. This leads to more frequent absences and, consequently, fewer opportunities for

students to acquire academic abilities in the classroom [18]. The researcher conducted a descriptive analysis, and the results are presented in Table 3 below.

Table 3. Descriptive Statistics of Academic Mindset Domains and Gender.

		Fixed Mindset			Malleable Mindset		
		M	SD	Sk	M	SD	Sk
Gender	Male	11.24	3.74	.07	18.08	2.83	-1.01
	Female	11.36	4.35	.68	16.63	4.29	-1.40

Note. $N = 307$; BB = boys boarding; GB = girls boarding; CO-ED = co-educational day; M = mean; SD = standard deviation; Sk = skewness.

The mean and standard deviation of the Academic Mindset Beliefs Scale were calculated for each participant. According to Table 3, males reported more malleable mindset beliefs ($M = 18.08$, $SD = 2.83$) than females, who had somewhat lower mean scores ($M = 16.63$, $SD = 4.29$) than males. One reason for this could be that female students face the detrimental impacts of stress and dangers from a stereotypical environment that says that mathematics is not for girls. When combined with additional stressors such as poverty, domestic duties, and lack of time to complete schoolwork, they tend to adopt a fixed mindset regarding mathematics. Therefore, all students need to strengthen their malleable mindsets.

The mean scores for fixed mindset beliefs did not differ

significantly by gender. This result suggests that students' gender had neither a positive nor a negative impact on their established academic mindset. Although the data in Table 3 indicate that more students had a malleable mindset, it is impossible to overlook the sizeable portion of students who agreed with fixed mindset beliefs in mathematics. This suggests that some students believe that mathematics relies on unchangeable, fixed abilities. Students with a fixed mindset are more prone to give up, especially when faced with challenges, and are readily intimidated by others' performance. The mean and standard deviation of the participants' scores on the Academic Mindset Beliefs Scale were determined, and the results are presented in Table 4.

Table 4. Mean Differences in Social Belonging Levels.

Variable	Gender			
	Male		Female	
	M	SD	M	SD
Feelings of Rejection (FOR)	22.09	4.12	21.96	3.67
Feelings of Belonging (				

Table 5. Descriptive Statistics of Mathematics Achievement Scores by Gender.

	Gender	N	M	SD
T-Scores	Male	165	52.21	9.06
	Female	142	48.09	10.39

Note. $N = 307$. M = Mean; SD = Standard Deviation; T-Scores = Mathematics

Based on the results in Table 5, males scored higher in mathematics ($M = 52.21$, $SD = 9.06$) than females. This suggests that boys outperform girls in mathematics.

Hypothesis Testing

An Independent Samples t -test comparing the mean gender differences in school adjustment was conducted to assess the first additional hypothesis. The results are presented in Table 6.

Table 6. An Independent Sample T-test for School Adjustment Scores by Gender.

		t	df	Sig. (2-tailed)
School Adjustment	Equal variances assumed	2.50	305	.01
	Equal variances not assumed	2.47	281.99	.01

Note. $N = 307$. T-Scores = Mathematics.

The data in Table 6 indicate that there were no significant gender differences in overall school adjustment ($t(305) = 2.50$, $p < .05$). Consequently, the first supplemental null hypothesis was rejected. This implied that although more boys than girls rated themselves higher on the school adjustment scale, both boys and girls had to adjust to school. This supports the results

that boys outperformed girls in terms of total school adjustment ratings. The researcher then concentrated on determining whether the various subdomains of students' school adjustment differed significantly by gender, as shown in Table 7.

Table 7. An Independent Samples T-test for the School Adjustment Domains.

Variable		t	df	Sig. (2-tailed)
Academic Adjustment	Equal variances assumed	1.22	305	.22
	Equal variances not assumed	1.21	278.83	.22
Social Adjustment	Equal variances assumed	2.17	305	.03
	Equal variances not assumed	2.17	300.78	.03
Emotional Adjustment	Equal variances assumed	3.43	305	.01
	Equal variances not assumed	3.41	292.28	.01

not significant. Boys and girls who adjust to school form good relationships with others in school, leading to almost the same performance. Nonetheless, gender variations in academic adjustment were statistically significant ($t(305) = 1.22, p = .22$). Boys rated their academic adjustment higher than girls,

indicating that focusing on this area could help students perform better in academics. A t -test comparing the mean gender differences in academic mindset beliefs was conducted to test the second supplementary hypothesis. The results are presented in Table 8.

Table 8. An Independent Sample T-test for Academic Mindset Beliefs Scores by Gender.

		t	df	Sig. (2-tailed)
Academic Mindset Beliefs	Equal variances assumed	2.59	305	.01
	Equal variances not assumed	2.58	291.105	.01

Note. $N = 307$. df = degrees of freedom.

According to the results in Table 8, there were no significant gender differences in views of academic mentality ($t(305) = 2.59, P < .05$). This led to the rejection of the second supplementary null hypothesis. Therefore, there were no significant gender variations in the students' academic mindset beliefs. This validated the results, which indicated that although the

mean scores differed, the scores of boys and girls were almost the same. This implies that even girls with fixed mindsets might perform as well as those with malleable ones. The researcher then determined whether the distinct subdomains of students' academic mindset beliefs differed significantly by gender, and the results are presented in Table 9.

Table 9. An Independent Samples T-test of Students' Academic Mindset Beliefs Sub-Domains.

		t	df	Sig.(2-tailed)
Fixed Mindset	Equal variances assumed	2.18	305	.06
	Equal variances not assumed	2.15	294.55	.06
Malleable Mindset	Equal variances assumed	2.74	305	.01
	Equal variances not assumed	2.74	298.50	.01

Note. $N = 307$. df = degrees of freedom.

Gender differences in fixed mindset beliefs were statistically significant ($t(307) = 2.18, p = .06$), as presented in Table 9. This indicates that girls give up readily, especially when they are unable to complete a task, since more girls than boys support fixed beliefs. The belief in a malleable mindset, however, did not differ significantly between male and female

students ($t(307) = 2.74, p < .05$). This showed that although more boys than girls had higher scores on the malleable

Social affiliation did not differ significantly by gender, according to the data in Table 10 ($t(307) = 4.36, p < .05$). Consequently, the third supplemental null hypothesis is rejected. The results showed that students' social belonging did not vary significantly by gender. This corroborates the findings, which

indicated that while girls outperformed boys on the social belonging measure, their mean scores did not differ significantly. The researcher then focused on identifying gender-based differences in the various subdomains of students' social belonging, and the results are displayed in Table 11 below.

Table 11. An Independent Samples T-test of Social Belonging Subdomains.

		t	df	Sig. (2-tailed)
Feelings of Rejection (FOR)	Equal variances assumed	.27	305	.78
	Equal variances not assumed	.27	285.28	.78
Feelings of Belonging (FOB)	Equal variances assumed	6.51	305	.00
	Equal variances not assumed	6.73	276.82	.00

Note. $N = 307$. df = degrees of freedom; M = Mean; SD = Standard Deviation.

According to Table 11, feelings of rejection differed significantly by gender ($t(307) = .27, p = .78$). This means that more boys than girls felt rejected, implying that boys were exposed to more negative school environments than girls. Conversely, no gender-based differences in feelings of belonging were found between boys and girls ($t(307) = 6.51, p < .05$).

This shows that the mean differences between the two

groups were not statistically significant, despite girls outperforming boys in terms of their feelings of belonging. The performances of boys and girls who appreciated the learning environment and interaction with their classmates were nearly identical.

The fourth supplemental hypothesis was tested, and the results are presented in Table 12.

Table 12. An Independent Sample T-Test for Mathematics Achievement Scores by Gender.

		t	df	Sig. (2-tailed)
T-Scores	Equal variances assumed	1.68	305	.06
	Equal variances not assumed	1.68	294.24	.06

Note. T-scores = Mathematics.

Gender disparities in mathematics achievement were significant according to the data in Table 12 ($t(305) = 1.68, p = .06$). This led to the acceptance of the fourth supplemental null hypothesis. The results indicate significant differences between genders in students' mathematical achievement. This confirmed that boys outperformed girls in terms of overall mathematics achievement.

same, it was inferred that social, emotional, and institutional integration was difficult for both boys and girls to achieve. However, in terms of academic adjustment, there were significant differences between male and female students, with boys outperforming girls academically. Other studies have also found that males are more optimistic about their mathematical abilities [35]. In contrast, Yau et al. [49] discovered that girls were more likely than boys to perceive social adjustment as having a greater influence. Furthermore, female students believed that psychological adjustment had a greater impact on academic adjustment than male students. For both boys and girls, the study found no gender differences in the relationship between social and psychological adjustment. This implies that although male students are generally better at handling their emotions, female students are also shown to be more capable of emotional adjustment.

The current results also support those of Hobbs [20], who revealed differences between students' and teachers' expectations of their adjustment, as students often base their goals on what their teachers think they should achieve. Hobb's study clearly shows that students have less self-respect and are unable to change when there are more expectation gaps between themselves and their teachers. Numerous studies have found that teacher expectations vary according to socioeconomic status, gender, and race. For instance, studies have shown that teachers often have lower expectations of girls than boys [20]. Because of this discrepancy, students may conform to these expectations and subsequently perform worse academically, producing self-fulfilling prophecies. As was the case with most schools in the current study location, students were exposed to teachers with inappropriate expectations. Therefore, more support resources are needed to provide a fair learning environment.

There were no discernible gender variations in mindset beliefs. Many studies conducted in other geographical regions have also revealed similar results [33, 41, 31]. The study was predicated on the hypothesis that adolescence is the time when conceptions of intelligence start to solidify, and that children do not come into the world with the belief that intelligence is permanent or unalterable. In other words, boys outperformed girls in this regard. However, gender variations in the malleable mindset were not statistically significant. That is, girls who endorsed a malleable mindset performed almost the same as boys, despite differences in mean scores.

Additionally, there were no discernible gender differences in social membership according to the findings of the current study. However, rejection sentiments differed by gender, with boys experiencing more rejection than girls. This suggests that boys were exposed to more unfavorable school situations than girls, since more boys than girls felt rejected. Boys and girls, on the other hand, did not differ in their sense of belonging depending on gender. This demonstrates that there was no statistically significant difference in the mean values between the two groups. Boys and girls who valued the classroom setting and their interactions with classmates per-

formed almost similarly. Although girls outperform boys in terms of feelings of belonging, boys and girls may perceive feelings of belonging or the relationship between them and mathematical achievement differently, as seen by the difference in the degree of correlation between the genders. The literature has extensively established the difference in feelings of belonging between males and females. The results of the current study indicate that girls had significantly greater feelings of belonging to mathematics than boys, which supports this conclusion. It is possible that the outcome was affected by the traditional structure of African civilization. Due to their propensity for interpersonal orientation, women may place a higher value on the overall sentiment of belonging [48]. On the other hand, feelings of rejection differed significantly by gender. This meant that more boys than girls felt rejected, implying that boys were exposed to more negative school environments than girls.

The study also showed that male students reported higher mean scores in mathematical accomplishment than female students, indicating that the gender factor was statistically significant. This observation aligns with earlier results that suggested that female students encounter more gender stereotype issues more frequently than their male counterparts do [17, 26]. Notably, differences in mindsets and their association with mathematics achievement were observed between female and male students' mindsets. For male students, malleable mindsets displayed stronger associations with mathematics achievement than for females. Conversely, fixed mindsets more strongly correlated with gender stereotypes among female students. Female students also reported a higher correlation between feelings of belonging and mathematics achievement than did their male counterparts. Furthermore, when gender was integrated with school adjustment, significant gender differences in academic adjustment emerged, but not for social, emotional, and institutional adjustments. This suggests the importance of considering gender-related individual differences, especially concerning academic adjustment, fixed mindsets, and feelings of rejection, warranting further investigation. It is imperative to emphasize the importance of paying attention to individual differences when it comes to interventions

adaptive skills programs that promote long-term school adjustment, academic mindset beliefs, and strong social bonds for both boys and girls to enhance mathematics achievement.

Therefore, the study recommends that teachers and other stakeholders be encouraged to integrate skills related to school adjustment, academic mindset beliefs, and social belonging into their lessons to enhance the acquisition of these variables equally among the genders. This can be achieved through clarity of values, focus on value-based actions, openness, and awareness of innate experiences instead of attempting to alter or control students' thoughts and emotions. These might go a long way in helping both boys and girls shape their academic careers and lives in the future.

Limitations

This study focused on gender differences in school adjustment, academic mindset, and social belonging in relation to mathematics achievement among secondary school students in Kajiado County, Kenya. Therefore, the results may not be generalizable across different cultural, socioeconomic, and educational contexts. Additionally, the correlational method used does not measure causality. The correlational design only captures short-term gender effects, while the long-term gender effects on school adjustment, academic mindset, social belonging, and mathematics achievement remain unexplored. The cross-sectional method used in the data collection may also have failed to show long-term relationships between the study variables; therefore, longitudinal research designs may be used to capture any potential dynamic interactions between gender differences from the time students enter school until they graduate.

Implications

The study's results offer valuable insights for teachers and school counselors. Therefore, this study recommends that future intervention programs for the enhancement of students' mathematics achievement should consider the gender differences. For instance, school counselors can use this knowledge to develop tailored interventions that address gender differences by creating a safe and secure learning atmosphere in which both boys and girls feel comfortable taking risks and participating in class. Moreover, school counselors and teachers should help students to set high but realistic expectations. Students with high social norms are considered to be socially adaptive and are more likely to interact with others, manage the intricacies of social expectations, and develop meaningful relationships. The unique challenges faced by female students highlight the need for targeted support from schools and community services during their school adjustment. Students with malleable mindsets are considered adaptive, are more likely to engage and persist in circumstances, and to spend more time on relevant tasks with better outcomes. However, considering the challenging, individualistic, competitive, selective, and exclusionary nature of mathematics, any attempt to intervene and improve achievement must begin with understanding the students' gender needs in the learning environment.

Abbreviations

BB	Boarding Boys
COED	Co-Educational Day
FOB	Feelings of Belonging
FOR	Feelings of Rejection
GB	Girls Boarding
MAT	Mathematics Achievement Test
SPSS	The Statistics Package for Social Sciences
SACQ	Student Adaptation to College Questionnaire
PSSM	Psychological Sense of School Membership

Author Contributions

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- [5] Baker, R. W., & Siryk, B. (1999). SACQ student adaptation to college questionnaire (2nd ed.). Los Angeles: Western Psychological Services.
- [6] Bundotich, S. (2017). Teachers' influence on the adjustment of Form One students to secondary schools, in Uasin Gishu County, Kenya. *Nairobi Journal of Humanities and Social Sciences*, 1(3).
- [7] Carey, J. J., & Delaney, M. F. (2010). T-scores and Z-scores. *Clinical Reviews in Bone and Mineral Metabolism*, 8, 113-121.
- [8] Chand, S., Chaudhary, K., Prasad, A., & Chand, V. (2021). Perceived causes of students' poor performance in mathematics: A case study at Ba and Tavua secondary schools. *Frontiers in Applied Mathematics and Statistics*, 7, 614408. <https://doi.org/10.3389/fams.2021.614408>
- [9] Cheung, H. Y., & Hui, S. K. F. (2003). Mainland immigrants and Hong Kong local students' psychological sense of school membership. *Asia Pacific Education Review*, 4, 67-74. <https://doi.org/10.1007/BF03025553>
- [10] Chirume, S., & Chikasha, A. S. (2014). A critical analysis of the factors affecting achievement in secondary school mathematics in Zimbabwe: A case study of Gweru District. *Merit Research Journal of Education and Review*, 2(9), 194-202. <http://www.meritresearchjournals.org/er/index.htm>
- [11] Collie, R. J., & Martin, A. J. (2017a). Students' adaptability in mathematics: Examining self-reports and teachers' reports and links with engagement and achievement outcomes." *Contemporary Educational Psychology* 49 <https://doi.org/10.1016/j.cedpsych.2017.04.001>
- [12] Deiglmayr, A., Stern, E., & Schubert, R. (2019). Beliefs in "brilliance" and belonging uncertainty in male and female STEM students. *Frontiers in Psychology*, 10, 1114.
- [13] De Waal, E., Coetzee, D., & Pienaar, A. E. (2018). Gender differences in the academic achievement of children with developmental coordination disorder. *South African Journal of Childhood Education*, 8(1), 1-10.
- [14] Dewar, G. (2010). Harmful beliefs: How a theory of intelligence can hamper your child's ability to learn. *Parenting Science*.
- [15] Dweck, C. S. (2000). *Self-theories: Their role in motivation, personality, and development*. Taylor & Francis. <https://doi.org/10.4324/97813157830fmweni>
- [16] El Moubchiri, C., Chahboune, M., Arraji, M., Guennouni, M., & Hilali, A. (2024). Cultural adaptation and validation of the Moroccan version of the psychological sense of school membership scale (PSSM) among Moroccan Students. *School Mental Health*, 1-14.
- [17] Flore, P. C., Mulder, J., & Wicherts, J. M. (2018). The influence of gender stereotype threat on mathematics test scores of Dutch high school students: A registered report. *Comprehensive Results in Social Psychology*, 3(2), 140-174.
- [18] Furner, J. M., & Duffy, M. L. (2022). Addressing Math Anxiety in a STEM World: Preventative, Supportive, and Corrective Strategies for the Inclusive Classroom. *European Journal of STEM*

- [34] Mutua, J., Kinai, T., Ndambuki, P., & Oyoo, S. (2020). Gender differences in academic mindsets and academic achievement among Form Three students in Nairobi County, Kenya. *International Journal of Applied Psychology*, 10(1), 1-7.
- [35] Mtshweni, B. V. (2022). Adjustment and socioeconomic status: How do these factors influence the intention to drop out of university? *South African Journal of Psychology*, 52(2), 262-274. <https://doi.org/10.1177/00812463211059141>
- [36] Mweni, N. T., O'Connor, M. M., & Kerich, W. (2022). Relationship between student attitude and achievement in mathematics among secondary school students in Ganze District, Kilifi County, Kenya. *East African Journal of Education Studies*, 5(4), 94-102.
- [37] Nur'aini, N. A., Miswanto, M., Munir, A., Pristanti, N. A., & Ravsamjani, F. (2024). A comprehensive investigation into first-year university student adjustment. *Bulletin of Counseling and Psychotherapy*, 6(3).
- [38] Paramanik, J., Saha, B., & Mondal, B. C. (2014). Adjustment of secondary school students with respect to gender and residence. *American Journal of Educational Research*, 2(12), 1138-1143.
- [39] Shariff, M. I. A. bin, Sulaiman, W. S. W., & Khairudin, R. (2022). Exploring the relationship between grit and flourishing: Are there gender differences? *International Journal of Academic Research in Business and Social Sciences*, 12(3), 519-530.
- [40] Sigmundsson, H., Guðnason, S., & Jóhannsdóttir, S. (2021). Passion, grit, and mindset: Exploring gender differences. *New Ideas in Psychology*, 63, 100878.
- [41] Shou, E., & Nanakida, A. (2022). Children's media use: Does it matter for social adjustment during the early school transition? *Child Indicators Research*, 15(6), 2267-2288.
- [42] Sofroniou, A., & Poutos, K. (2016). Investigating the effectiveness of group work in mathematics. *Education Sciences*, 6(3), 30. <https://doi.org/10.3390/educsci6030030>
- [43] Stohlmann, M., & Yang, Y. (2024). Growth mindset in high school mathematics: A review of the literature since 2007. *Journal of Pedagogical Research*, 8(2), 357-370.
- [44] Strayhorn, T. L. (2019). *College students' sense of belonging: A key to educational success for all students*. Routledge. <https://doi.org/10.4324/9781315297293>
- [45] Visser, M., & Arends, F. (2019). The contribution of South African teachers to students' sense of belonging and mathematics achievement: Students' perspective from the 2015 Trends in International Mathematics and Science Study. *South African Journal of Childhood Education*, 9(1), 1-11. <https://hdl.handle.net/10520/EJC-1f91b8e695>
- [46] Webb-Williams, J. (2014). Gender differences in school children's self-efficacy beliefs: students' and teachers' perspectives. *Educational Research and Reviews*, 9(3), 75-82.
- [47] Williams, C. L., Hirschi, Q., Hulleman, C. S., & Roksa, J. (2022). Belonging in STEM: Growth mindset as a filter of contextual cues. *International Journal of Community Well-Being*, 1-37. [https://doi.org/10.1007](https://doi.org/10.1007/s42413-021-00111-z)