Journal of
Advanced Psychology
(JAPSY)

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CARI Journals

Journal of Advanced Psychology
ISSN: 2791-3244 (Online)
Vol.7, Issue No. 4, pp 15 - 29, 2025
www.carijournals.org

A correlation between School Adjustment and Mathematics Achievement among Kenyan Secondary School Students

[1]*Joash Mwandike Kirui, [2]Jotham Dinga, [3]Syprine Oyoo

[1]Ph.D in Educational Psychology, Department of Educational Psychology, Kenyatta University

[2,3]Lecturer, Department of Educational Psychology, Kenyatta University

https://orcid.org/0000-0002-5019-1410

Accepted: 1st Oct, 2025, Received in Revised Form: 19th Sep, 2025, Published: 29th Oct, 2025

Abstract

Purpose: Mathematics is the foundation of knowledge, yet poor achievement is a concern for education stakeholders as students struggle to balance passion with performance.

Methodology: This study used a correlational research design with a targeted population of all Form Three students enrolled in Kajiado County. Three hundred and ninety (390) secondary school students constituted the sample. A purposive sampling technique was used to select ten (10) schools in the County, a stratified sampling technique was used to select schools from the 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). Additionally, the participants' academic records provided data on their mathematics achievement. The relationship between school adjustment and mathematics achievement was tested using the Pearson's product-moment correlation coefficient.

Findings: The results showed a significant positive correlation between students' school adjustment and mathematical achievement ($r = .34$, $p < .05$). Furthermore, this study found that academic, social, emotional, and institutional school adjustment subscales accounted for 30% of the variance in math achievement. This study concluded that school adjustment is an important individual factor that enhances students' mathematics achievement.

Unique contributions to theory, practice, and policy: This study adds to the body of knowledge by emphasizing the unique contributions of school adjustment to students' mathematical success. It provides policymakers with information by highlighting the need for customized school adjustment support programs. It provides teachers and school counselors with practical guidance for creating interventions that support healthy school adjustment and improve mathematics achievement in students from diverse backgrounds.

Keywords: *School Adjustment, Mathematics Achievement, Secondary School Students*

INTRODUCTION

The current study attempted to provide empirical evidence for the relationship between non-cognitive psychological aspects and secondary school students' mathematics achievements. Considering the various combinations of diverse factors, researchers have found it increasingly complex to provide a clear picture of the factors that predict mathematical achievement. Worldwide, mathematical abilities are the cornerstones of innovation and technology (Chand et al., 2021). Mastery in mathematics is necessary for occupations that require investigative, logical, critical, and analytical skills. Mathematical literacy is required for anyone seeking to progress in their profession or to enter the workforce (Chirume & Chakasha, 2014). Thus, recognizing components that may affect mathematics achievement would help psychologists and educational stakeholders design and implement effective interventions to enhance student achievement.

This concern is further exacerbated in higher education contexts, where mathematics is not only a basic subject for studying other academic fields, such as science, technology, and engineering, but is also essential for nurturing creative and innovative experts (Weinhandl et al., 2025). A nation requires highly trained and talented experts to drive innovation and development across various fields. Globally, nations striving for economic progress place a premium on mathematics. Following the conclusion that mathematical concepts are generally relevant to learning, it is essential to create focused interventions and lessons that are adapted to meet students' needs.

Standardized tests are widely used to evaluate students' mathematics achievement (Hasmi, 2021). In Kenyan schools, mathematics achievement is assessed through national examinations, which provide standardized grades or scores that are used for school rankings, progression to higher education, and entry into scientific and technological professions (Okello, 2020), as in the current study.

A review of the related literature in this field reveals that various personal and social factors are related to mathematical achievement. In addition to an individual's cognitive and non-cognitive characteristics, successful mathematics achievement is also related to the interplay between the individual's personal traits and the social environment. Therefore, a wide range of variables have the potential to influence mathematics achievement. Knowledge of the influence of different factors on mathematics achievement is necessary for teachers to maximize student achievement in a worthwhile manner (Pham et al., 2025). Researchers in educational psychology have revealed that individual factors may be crucial in this regard. Individual factors may enhance the likelihood of aptitudes, attitudes, and behaviors that contribute to better or worse academic achievement (Peterson et al., 2009; Surya & Mehendran, 2017; Collie & Martin, 2017). Although considerable evidence has confirmed that individual traits, such as intelligence, motivation, self-confidence, and math anxiety, predict mathematics achievement (Simanihuruk & Nasution, 2021), other individual factors have attracted limited attention. The current study provides evidence for the relationship between school adjustment and mathematics achievement among secondary school students, as the relevant research results remain largely less prevalent.

School adjustment is an individual factor that has been correlated with mathematics achievement (Collie & Martin, 2017a; Surya & Mehendran, 2017). School adjustment is the capacity to sustain attitudes, actions, and feelings in the face of evolving, novel, or ambiguous academic demands (Collie & Martin, 2017). School adjustment is related to many aspects of students' lives. Being well adjusted is viewed as the key to academic success, specifically in academic contexts. Consequently, many students tend to believe that to be academically successful, all they need is to be school-adjusted (Peterson et al., 2009).

School adjustment is a multifaceted process, and the relationship between school adjustment and mathematics achievement seems to be complex. Factor analytic studies have supported four higher-order dimensions: social, emotional, academic, and institutional adjustments (Baker & Siryk, 1999). Students who exhibit a variety of abilities and behaviors, such as social, emotional, academic, and attachment skills, are better able to adjust to and engage in the school environment (Baker & Siryk, 1999; Gutiérrez et al., 2025). Socially adjusted refers to individuals who adapt to the current social environment by behaving appropriately, thus contributing positively to the functioning of the social group, and is associated with interpersonal interactions and social recognition (Mtshweni, 2022). By contrast, emotionally adjusted individuals exhibit intended outcomes that promote the enhancement of emotional state, self-determination, health, and well-being. Moreover, academically adjusted individuals handle the various learning requirements of the classroom well, whereas institutionally adjusted individuals are content with general and specific educational experiences (Baker & Siryk, 1999). Many emotional and behavioral outcomes are linked to school adjustment (Gutman & Schoon, 2018). This is why it is critical to differentiate between various school adjustment dimensions, because they exhibit distinct and perhaps opposing patterns of association with a number of outcomes.

Based on relevant research data, mathematics achievement has been found to be correlated with and/or predicted by school adjustment as an individual characteristic (Collie & Martin, 2017a; Surya & Mehendran, 2017). However, the relationship between these two variables appears to vary based on the dimensions of school adjustment examined. For instance, in a study of 372 elementary children (Collie and Martin, 2017a), all dimensions of school adjustment were found to be related to students' math achievement. Mathematics achievement was found to be positively predicted by all four school adjustment dimensions: social, behavioral, cognitive, and school engagement. School adjustment is characterized by students' exhibition of expected academic and interpersonal outcomes, general motivation to learn, and personal outcomes (e.g., positive self-esteem and lack of depressive symptoms). This process involves advancing processes that guide students' readiness and eagerness to meet the aforementioned criteria. Students who are well adjusted are more inclined to participate, endure, and dedicate more time to pertinent tasks. Thus, among the four quadripartite models of adjustment developed by Baker and Siryk (1999), social adjustment was more likely to be positively correlated with mathematics achievement, particularly after controlling for cognitive skills. This picture, although complex, is consistent with Zhang et al.'s (2018) finding that school adjustment is significantly and positively correlated with students'

mathematics growth via the mediating effects of students' academic self-concept, as opposed to showing a direct impact on students. Thus, the current study aims to contribute to the existing literature by further investigating the aforementioned direct relationship and promoting a practical understanding of school adjustment in a mathematical setting.

The present study

This study extends a previous study on the same population (Jain & Mohta, 2020). The previous analysis examined the phenomenon of student adjustment in secondary students and its correlation with mathematics achievement, while the present study examined whether the same school adjustment correlates with mathematics achievement, contributing to the existing literature and filling research gaps.

More specifically, considering the importance of mathematics achievement in the present socio-economic and cultural context, the current study aimed to provide empirical evidence for the correlation between a single individual factor, that is, school adjustment, and mathematics achievement. Numerous studies have examined the relationships between individual factors and mathematics achievement; however, existing data regarding the effect of the components of school adjustment are limited or nonexistent. The current study contributes to the existing literature by filling these gaps and helping us better understand why some students pursue difficult subjects such as mathematics, engage in coping strategies that reduce difficulties, put in effort, take on challenges, persist in learning activities such as mathematics, and achieve higher mathematics scores.

According to the existing literature (Collie and Martin, 2017a; Zhang et al., 2018; Surya and Mehendran, 2017; Jain and Mohta, 2020), it is expected that school adjustment dimensions (social, emotional, academic, and institutional) are expected to be positively correlated with mathematics achievement.

METHOD

Participants

A total of 390 participants completed the questionnaires, 188 of whom were boys and 202 were girls. Eighty-three (83) questionnaires were excluded due to missing items, items marked more than once, stray markings on item responses, items left blank, or individuals marking off items in only one column (n = 83). The final number of participants retained in the current study was 307, including165 boys (53.8%) and 142 girls (46.2%); 263 (87.67%) public schools and 44 (12.33%) private schools; 72 (23.5%) boys' boarding schools, 96 (31.2%) girls' boarding schools, and 139 (45.3%) coeducational day schools. The percentage return rate was 78.7%. The characteristics of the participants are shown in Table 1.

Table 1. Participants' characteristics (n=307)

	School type			
	GB	BB	COED	Total
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

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

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

Sampling Strategy

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

Materials

Demographics

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

The School Adjustment Measures

The Student Adaptation to College Questionnaire (Baker and Siryk, 1989) was used to gauge students' degree of school adjustment. The sixty-seven items on this self-report questionnaire

examined 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 on the emotional subscale, *"I have been feeling nervous recently,"* gauges the participants' psychological and physical states. The academic adjustment subscale assesses the 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' relationships with this school (questions such as *"I am pleased now with my decision to attend this school, in particular"*). Participants rated themselves on a 6-point Likert scale, with 1 denoting "strongly disagree" and 6 denoting "strongly agree." After some items were reverse-coded, the overall alpha coefficient was $\alpha = .85$. The study's school adjustment individual subscales showed reliability of $\alpha = .71$ for academic adjustment, $\alpha = .70$ for social adjustment, $\alpha = .70$ for emotional adjustment, and $\alpha = .70$ for institutional adjustment.

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 mid-term and end-of-first term examinations. The Statistical Package for Social Sciences (SPSS) was used to enter and calculate the mean score and total number of marks for 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 the SPSS (Carey & Delaney, 2010).

Statistical Analysis

This study aimed to determine whether students' school adjustment and mathematics achievement are correlated. To accomplish this goal, the following null hypothesis was proposed:

H01: There is no significant relationship between school adjustment and mathematics achievement among secondary-school students. Pearson's product-moment correlation and multiple regression analyses were used to analyze the data.

RESULTS

School Adjustment

Descriptive Results

First, complex variables were constructed based on the highlighted factors. Table 2 presents the means, standard deviation, skewness, and kurtosis values. Skewness and kurtosis were applied to verify whether the parametric analysis could be applied to the data. Since all of the skewness and kurtosis values were less than 2, they were regarded as normally distributed.

Table 2: Means, Standard Deviations, Skewness, and Kurtosis of the Variable

	Range	Min	Max	*M*	*SD*	*Sk*	*Kur*
GSAS	335	67	402	273.27	49.69	-.53	.89

Note. N = 307; GSAS = Global School Adjustment Score; Min = Minimum; Max = Maximum; M = Mean; SD = Standard Deviation; Sk = Skewness; Kur = Kurtosis.

The results were analyzed descriptively to better understand how the participants responded to the school adjustment scales based on school type and gender. Table 3 summarizes the mean, standard deviation, and skewness of the responses.

Table 3: School Adjustment by School Type and Gender

		School Adjustment		
		M	*SD*	*Sk*
School Type	BB	272.73	44.26	-1.05
	GB	261.39	59.01	.22
	CO-ED	279.78	47.11	-.20
Gender	Boys	279.79	46.09	-.21
	Girls	265.69	52.80	.70

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

According to Table 3, the mean school adjustment was the highest among individuals in coeducational schools (*M* = 279.78, *SD* = 47.11). The average for girls from boarding schools was 261.39 (*SD* = 59.01), whereas that for boys from boarding schools was 272.73 (*SD* = 44.26). Coeducational schools and boarding boys schools had negative coefficients of skewness (coeducational, -.20; boarding boys, -1.05), whereas boarding schools girls had a positive value (.22). Furthermore, the results showed that, in terms of gender, the mean score for boys was 279.79 (*SD* = 46.09), while the mean score for girls was 265.69 (*SD* = 52.80). Interestingly, the coefficient of skewness for females was positive (*Sk* =.70) and significant.

Based on the school adjustment values, individuals were categorized into low, moderate, or high school adaptation groups using the collected data. Using values that ranged from 67 to 402, groups were formed to classify school adaptation as: (67 to 134), moderate (134.1-268), and high (268.1-402). The results of the group classification are presented in Table 4.

Table 4: Levels of School Adjustment

LSA	Frequency	%	*M*	*SD*
Low	3	.98	106.33	34.78
Moderate	173	56.35	198.59	23.08
High	131	42.67	374.10	19.91

Note. N = 307; LSA = level of school adjustment; M = mean; SD = standard deviation.

As shown in Table 4, most participants were classified as having moderate (56.35%) or high (42.67%) school adjustment. Only 0.98% of the participants were classified as having poor school adjustment. The mean scores of the three groups were low (*M* = 106.33, *SD* = 34.78), moderate (*M* = 198.59, *SD* = 23.08), and high (*M* = 374.10, *SD* = 19.91). The participants in the low adjustment group showed the largest variability, as indicated by the high standard deviation in the school adjustment group.

HYPOTHESIS TESTING

School adjustment comprises four core characteristics: academic, social, emotional, and institutional. A series of correlation analyses using the Pearson product-moment correlation coefficient was performed to ascertain the bilateral relationships between the variables under consideration. The relationships between the school adjustment subscales and mathematics achievement are presented in Table 5.

Table 5: Correlation Between School Adjustment Subscales and Mathematics Achievement

		1	2	3	4	5	6
1	T-MAS	-					
2	GMAS	.34**	-				
3	SA	.21**	.30**	-			
4	EA	.18**	.30**	.11**	-		
5	AA	.18**	.89**	.01*	-.01**	-	
6	IA	.49**	.36**	.14*	.15**	.13**	

Note. N = 307; AA = academic adjustment; SA = social adjustment; EA = emotional adjustment; IA = institutional adjustment; GSAS = Global School Adjustment Scores; T-MAS T-Score Mathematics Achievement Score.

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

According to Table 5, there was a positive and significant correlation between school adjustment and mathematical achievement (r (307) =.34, p<.05). Consequently, the first null hypothesis was rejected, and the alternative hypothesis was accepted. However, the association between school adjustment subscales and mathematics achievement varies depending on which subscale is being studied. Mathematics achievement was positively connected to an adaptive form of school adjustment (r =.21 for social, r=.18 for emotional, r=.18 for academic, and r=.49 for institutional). In other words, mathematics achievement increases in proportion to the degree to which students describe having high adjustment in their academic lives. Additionally, Table 5 demonstrates that, in most instances, there are statistically significant relationships between various adjustment subscales and global school adjustment. Academic adjustment is negatively correlated with emotional adjustment, suggesting a fearful attachment characterized by participants who have a negative sense of self and view others as unresponsive and rejecting.

Regression Analyses

Multiple linear regression analysis was used to investigate the potential predictive value of school adjustment for mathematics attainment. This study investigated the relationship between mathematics accomplishments and four school adjustment dimensions: social, emotional, academic, and institutional. Significant regression equations were found (F (4,302) = 32.21, p<.05, R^2 =.30). The overall results of the regression analysis showed that four school adjustment subscales—academic, social, emotional, and institutional— accounted for 30% of the variation in mathematics success. This indicates that the school adjustment subscales are significant predictors of mathematics achievement.

Regarding the predictive value of the individual subscales of school adjustment for mathematics achievement, the results showed (β =.11, p<.05) for academic adjustment, (β =.14, p<.05) for social adjustment, (β =.13, p<.05) for emotional adjustment, and (β =.45, p<.05) for institutional adjustment, respectively.

Independent sample t-tests were also used to compare the mathematical achievement values for the highly and weakly adjusted groups. Using an independent sample t-test, participants were compared between the mean values of mathematical performance with low and high adjustments, and the results showed significant differences (t (305) = 22.72, p<.05). The fact that participants in the high school adaptation group reported significantly higher mathematics (M = 57.89, SD = 5.67) than those in the lower school adaptation group (M = 42.06, SD = 6.51) supports the predictive model that shows a strong correlation between the independent and dependent variables.

DISCUSSION OF RESULTS

The primary objective of this study was to investigate students' mathematics achievements in relation to school adjustment. Preliminarily, the possible correlational connections between the subscales of school adjustment and students' mathematics achievement were examined. According to the results, the adaptive form of school adjustment was positively correlated with the students'

performance as assessed by grades, rejecting the hypothesis. Favorable school adjustment protects students from the adverse impacts of unfamiliar or difficult circumstances, which is conducive to better mathematics achievement.

Additionally, instead of being worried, anxious, or annoyed, students who successfully adjust seem to feel that they belong to a new classroom (Collie & Martin, 2017a; Zhang et al., 2018). Students with high school adjustment were relaxed, safe, and peaceful. This allows them to regulate their emotions and feelings effectively, listen to and follow instructions, communicate effectively with others, share and take turns, and deal with everyday problems (Lakhani et al., 2017). Their motivation to participate in school activities was based on their passion for learning. For instance, certain adjustments in the classroom were found to have a detrimental effect on mathematics students' expectations and values (Furner, 2022). Thus, it is fear during school adjustment that is likely to be positively associated with difficulty in managing work and new routines, fear of bullying, loss, and failure to make friends, all of which could be negatively associated with student performance (Furner, 2022).

Moreover, in an attempt to understand the dimensions that may affect mathematics achievement, this study investigated whether the subscales of school adjustment are predictors of mathematics achievement. Based on the results of previous studies (Collie & Martin, 2017a; Surya & Mehendran, 2017), it was postulated that the adaptive form of school adjustment was a positive predictor of mathematics achievement. This hypothesis was confirmed, as all subscales positively predicted mathematics achievement. A favorable adjustment experience at the outset requires exposure to a safe psychosocial learning environment. When students join a new educational environment, their primary focus is on how to fit into the new learning environment consisting of their classmates and teachers (Furner, 2022). This result is in line with Furner (2022), who discovered that daily interactions with teachers and the formation of new friendships at the beginning of the term were important factors in determining academic progress, including in mathematics, throughout the term. When students experience feelings of attachment to their learning environments, their self-esteem, self-confidence, and trust are strengthened. In addition, they desire work that is challenging and demanding, and hence, leads to outstanding mathematical performance. The results are not surprising, given that such students are exposed to multifaceted adaptations, allowing them to manage several changes simultaneously (Lakhani *et al*., 2017). Therefore, it is clear from the present study that secondary students of all genders, social backgrounds, and school types are likely to experience school adjustment in the same way.

Moreover, the beta coefficients of the four school adjustment subscales revealed that institutional adjustment had the highest predictive value for mathematics achievement. The study's results support the findings of Ames et al. (2011), who found a link between mathematical performance and institutional adjustment. According to the current research, institutional adjustment contributes to increased connections and satisfaction with educational institutions, which, in turn, promotes coping mechanisms to counteract depressive psychological states. More precisely, the results indicated that students who experienced stronger social membership networks during academic

stress were more committed to their school and adapted to academic and social life. Notably, all the participants in this study were third-year secondary school students who had already committed to studying at the school where they were enrolled. Therefore, the results may indicate that Form Three students had fewer institutional adaptation problems than students at other levels. Institutional adjustment, which mostly involves intellectual commitment to schools, indirectly affects students' retention.

The participants with poor adjustment and those with high adjustment also differed significantly according to the *t*-test. Mathematics performance was poor for low-adjusted students and better for high-adjusted students. This result supports previous research by Zhang et al. (2018) and Surya and Mehendran (2017), which highlighted that school adjustment for achievement for successful students is substantially higher than for those who fail. Similarly, the current results support Jain and Mohta's (2020) finding that mathematics achievement is highly correlated with student adjustment. According to Collie and Martin (2017a), students' inability to adjust their thoughts, behaviors, and actions affects how they respond to or listen to others. Therefore, learners' adjustment to a particular subject's content can be extremely important. Additionally, if students demonstrate stronger adaptability and adjustment in mathematics, they can reduce their aggravation and anxiety when facing new mathematics problems or tests, and they can develop new ideas and experiments with new approaches. This is likely to improve their academic performance and completion rates.

The current results support those of Hobbs (2024), 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 results clearly showed 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 teachers' expectations vary according to socioeconomic status, gender, and race. For instance, studies have shown that teachers often have lower expectations for girls than for boys (Hobbs, 2024). Because of this discrepancy, students may conform to these expectations and subsequently perform worse academically, thereby 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, additional support resources are required to create a fair learning environment.

LIMITATIONS

Because this study focused on secondary students' school adjustment in relation to mathematics achievement within Kajiado County in Kenya, the results may not be generalizable across different cultural, socioeconomic, and educational contexts. Additionally, the correlational nature of this study captures only short-term effects, while the long-term effects of students' school adjustment 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, a longitudinal research design may be conducted to capture any potential dynamic

interactions between situational and individual factors from the time students enter school until they graduate.

CONCLUSION

Given these limitations, the results of the current study contribute to a deeper understanding of the possible factors that influence mathematics achievement. This study suggests that school adjustment is an important individual factor that constitutes a helpful construct for identifying individual differences in mathematics achievement. It is expected that these results would help fill the existing gap regarding the relationship between the dimensions of school adjustment and mathematics achievement. Additionally, this study contributes to the existing literature in which the relevant data were inconsistent.

IMPLICATIONS

The results of this study can be considered as a resourceful guideline for school counselors and teachers. Therefore, this study recommends that future intervention programmes to enhance students' mathematics achievement consider the dimensions of school adjustment. For instance, bolstering participants' academic adjustment can lead to better mathematics achievement by being highly committed and attached to academic goals and viewing them as opportunities for further learning rather than threats. Teachers should boost institutional adjustment by creating a safe and secure learning atmosphere in which students feel comfortable taking risks and participating in classes. Moreover, school counselors and teachers should help students to set high but realistic norms. Students with high social norms are considered socially adaptive and are more likely to interact with others, manage the intricacies of social expectations, and develop meaningful relationships. Students with emotional stability are considered adaptive, are more likely to engage and persist in circumstances, and 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 an understanding of students' individual needs in the learning environment.

Conflicts of Interest: The author (s) declare (s) no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding: The Authors received no funding for this study.

Data Availability: The data used for the analysis in this study are available from the corresponding author upon request.

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