

MATHEMATICS ENGAGEMENT AMONG SECONDARY STUDENT: A COMPARATIVE STUDY BASED ON SOCIOECONOMIC STATUS

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ABSTRACT

Engagement of students in mathematics is an important determinant which affects academic success as well as the motivation of students in secondary schools. On the other hand, there is inadequate information about the role played by socio-demographic variables like social category and parental occupation in determining student engagement. The objective of this research was to study the differences between social categories and parental occupation on student engagement in mathematics among secondary school students. This research was undertaken using quantitative methodology with a descriptive survey research design. The sample consisted of 211 students of class IX who were taken from two UP Board schools located in Lucknow district. The selection of participants was made through purposive sampling method. The data was collected from the subjects through the tool "Student Engagement in Mathematics Scale" (Perception Scale) designed by Dr. Gurpreet Kaur & Dr. Ram Mehar. Analysis of data was carried out using non-parametric statistical methods, more specifically, Mann-Whitney U test. The result showed that no significant difference was seen in cognitive and behavioral engagement based on social category, however, a significant difference was seen in affective engagement with students of reserved social category having higher engagement. Moreover, there was no observed difference among the dimensions of engagement when categorized according to the job status of parents. In summary, social category and the jobs that the parents have cannot influence engagement except for affective engagement. As a result, creating positive emotions is crucial in enhancing engagement among students.

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INTRODUCTION

Mathematics is an important and mandatory subject at the secondary education level, and it plays a significant role in the curricula for students who plan to pursue their careers in Science, Technology, Engineering, and Mathematics (STEM). Moreover, it helps develop critical

thinking, analytical, and problem-solving skills that are indispensable for students in the contemporary era of knowledge and technology (National Research Council, 2001). It should be noted that a good understanding of the principles of mathematics is important for future opportunities for successful career development within STEM fields.

Unfortunately, mathematics is considered a very challenging and scary subject for many students. The feelings associated with mathematical tasks and challenges have resulted in the development of mathematics anxiety, and this condition includes fear, tension, and apprehension that are experienced by individuals while solving mathematical problems (Ashcraft & Krause, 2007). In addition to its negative impact on students' achievements, it can lead to poor attendance in class and a negative attitude towards the subject.

In order to overcome these difficulties, the concept of student engagement has gained increasing recognition among researchers as being a critical element in improving the outcomes of education. Engagement is a multifaceted construct which consists of behavioral, emotional, and cognitive dimensions (Fredricks, Blumenfeld, & Paris, 2004). An engaged student tends to exhibit persistence, enthusiasm, and resilience when completing difficult academic assignments (Skinner, Kindermann, & Furrer, 2008). Furthermore, high levels of engagement are positively related to high grades, deep comprehension of material, and retention (Wang & Eccles, 2013). In the case of mathematics, engagement is especially important since it allows students to develop understanding of mathematical concepts and practice consistently.

The importance of various affective constructs in motivating students and enhancing their engagement cannot be denied. One of such constructs is self-efficacy. Self-efficacy may be defined as a belief in one's ability to accomplish specific academic tasks (Bandura, 1997). Higher self-efficacy means increased confidence in one's capabilities, readiness to tackle challenging problems, and perseverance in dealing with difficulties. Numerous studies show positive relationships between self-efficacy and academic achievements as well as motivation and engagement (Pajares & Miller, 1994; Bandura, 1997). On the other hand, lower self-efficacy leads to disengagement from study activities.

Moreover, socio-economic status (SES) is one more significant contextual variable influencing student engagement. SES impacts the accessibility of educational resources, parental involvement, and learning opportunities, thus affecting the students' academic performance (Sirin, 2005). For example, students coming from high SES families have higher chances to experience support through learning, while individuals with low SES encounter barriers preventing their academic success in mathematics. The understanding of SES barriers is necessary to ensure inclusiveness within educational processes.

Finally, classroom environment and instructional variables play a vital role in promoting student engagement. Good teacher-student relationships and interaction between students and educators, as well as a friendly learning environment, help learners participate actively and develop positive attitudes towards the subjects of study (Klem & Connell, 2004). Problem-based and inquiry-based learning are some instructional variables positively influencing students' cognitive processes (Hmelo-Silver, 2004; Nguyen et al., 2024). Thus, it is important to take into account environmental and emotional variables to increase engagement in the subject matter.

The main objective of the current study is to study the phenomenon of students' engagement in mathematics at the secondary school level, especially looking into the aspects of self-efficacy and socio-economic status. This will help to understand the impact of the two on the level of student engagement and their overall performance. The research findings would provide information for teachers and other stakeholders on how they could formulate plans which would mitigate mathematics anxiety and boost self-belief of students to enhance their engagement.

In their study, Jansen et al. (2023), employing the methodology of phenomenography, investigated secondary mathematics teachers' definitions of students' engagement. The results suggest that learning-oriented teachers incorporate cognitive, social, and affective aspects, whereas schooling-oriented teachers concentrate mainly on behaviour. The current study brings into light the necessity to foster students' multidimensional engagement and the existence of a gap in knowledge related to teachers' perceptions and practice. In turn, Maamin et al. (2022) studied the effects of cognitive, behavioral, and affective engagement on mathematical achievements via quantitative correlation design. Results reveal the significant positive effect of affective engagement, followed by behavioral, whereas cognitive engagement is negative, indicating the necessity for multidimensional subject-specific engagement investigation. Finally, Mirzaei et al. (2021), using qualitative multiple case research design, investigated both teachers' and students' perception of engagement.

Results demonstrate various degrees of coincidence between teachers' and students' perceptions, wherein the former were focused on instruction and the latter on social aspects. Alrajeh and Shindel (2020) conducted an analysis on factors associated with student engagement through a quantitative approach. Instructional support was found to have the most effect on engagement, followed by emotional and organizational supports. Teachers' gender and experience were also found to influence student engagement. This study advocates teacher training and addresses the gaps in defining particular effective instructional practices. Wang et al. (2020) conducted a longitudinal quantitative study about the relationship among the quality of the classroom, student engagement, and achievement. It was revealed that student and observational assessments were better predictors of the result than teacher assessment. This study addresses the significance of using multiple informants in evaluation and research and calls attention to gaps in longitudinal studies with domain specificity. Tomaszewski et al. (2020) conducted a longitudinal quantitative study using SEM and found engagement to be a mediator between SES and academic achievement. For their research on the effectiveness of strategies that enhance engagement in lowering math anxiety, Everingham et al. (2017) employed a mixed-methods quasi-experimental design. It was found that strategies promoting engagement led to improvement in terms of students' confidence, achievements, retention and satisfaction.

The significance of the study is in emphasizing the usefulness of engagement, as well as in the identification of limitations in causal mechanisms and generalizability to other disciplines. With respect to the examination of critical mathematics instruction at the micro-level in a remedial high school, Brantlinger (2013) applied qualitative discourse analysis. It is reported that the application of CM made marginalized students feel heard, although the process still involved certain resistance. The contribution of the study lies in stressing the empowering nature of CM, despite difficulties in its use and gaps in micro-level analysis of classroom discourse. For their study on predictors of students' math achievement, Park (2005) used hierarchical linear modelling to find out what classroom factors and engagement in classroom activities influence students' success. It was found that engagement played an important role for performance improvement, while classroom factors were insignificant. This study underscores the need to focus on engagement, which may be hampered by a lack of attention to measurement of engagement, as well as diversity issues and generalizability.

A review of literature shows that although student engagement in mathematics is a complex construct, there are still many aspects of engagement that have not been clearly identified. According to Jansen et al. (2023), teacher perceptions of engagement differ in such aspects as a focus on meaningful learning or behavioral compliance, which requires further exploration. Moreover, according to Mirzaei et al. (2021), misalignment in engagement perception exists between teachers and students, thus requiring a better understanding of the issue.

Additionally, engagement depends on both instructional practices and context. As shown by Alrajeh and Shindel (2020), instructional support was the best predictor of student engagement, and Wang et al. (2020) highlighted that observer and student perspectives were stronger predictors of outcome. It proves the need for developing a list of practices contributing to better engagement and considering different viewpoints.

Importantly, engagement is a significant element that helps to achieve academic success and address inequities. Park (2005) highlighted its strong positive influence on student achievement in mathematics, and Tomaszewski et al. (2020) showed that engagement partially mediated the effect of socio-economic status on achievement and predicted the development of skills.

Moreover, engagement impacts affective indicators. As stated by Everingham et al. (2017), student engagement reduces mathematics anxiety and positively influences performance, and Brantlinger (2013) noted its empowering nature. Marks (2000) pointed at the influence of subject matter and instructional reforms. Based on that background study, the purpose of this study is to describe how socioeconomic status can affect mathematics engagement on students.

METHOD

This research was conducted using a quantitative approach to systematically assess student engagement within the field of mathematics. To achieve this, a descriptive survey design was adopted, providing a robust framework for examining the existing state of affairs, student attitudes, and the inherent relationships among variables without the introduction of any external manipulation. The study involved a total of 211 Class IX students drawn from two UP Board secondary schools located in the Lucknow district, representing the target population of secondary-level students enrolled in mathematics courses. These participants were selected through a purposive sampling procedure, wherein the choice of specific schools and individuals was guided by their accessibility and direct relevance to the primary objectives of the investigation. For the purpose of data collection, the study utilized the "Student Engagement in Mathematics Scale," specifically the Perception Scale developed by Dr. Gurpreet Kaur and Dr. Ram Mehar, which served as the primary instrument for gathering empirical evidence regarding the students' academic involvement and perceptions.

RESULTS AND DISCUSSION

Results

The primary objective of this research is to investigate the impact of social categories on student engagement in mathematics among secondary school students. It is hypothesized that there is a significant difference in how students engage with mathematics based on their respective social categories. To explore this further, the study specifically examines the influence of social categories on the perception of cognitive engagement among secondary-level students within the U.P. Board. In relation to this sub-objective, the study tests a null hypothesis which posits that there is no significant impact of social category on the perception of these students toward their cognitive engagement in the subject. By analyzing these variables, the research seeks to determine whether social background plays a definitive role in shaping the cognitive involvement and overall academic participation of students in the mathematics classroom.

Table 1. Cognitive Engagement Rank of Social Category

	Social Category	N	Mean Rank	Sum of Ranks
Cognitive engagement	Reserved	125	109.10	13637.00
	Unreserved	86	101.50	8729.00
	Total	211		

Table 2. Cognitive Engagement Test Statistics of Social Category

	Cognitive Engagement
Mann-Whitney U	4988.000
Wilcoxon W	8729.000
Z	-.890
Asymp. Sig. (2-tailed)	.373

Table 3. Social Category Means Rank

Variable	Social category	Mean Ranks	N	Mann-Whitney U values	Remark
Cognitive Engagement	Reserved	109.10	125	4988.000	p> 0.05
	Unreserved	101.50	86		

The statistical analysis presented in Table 3 details the results of the Mann–Whitney U test, which was administered to determine if significant disparities exist in cognitive engagement based on students' social categories, specifically comparing the Reserved and Unreserved groups. The descriptive data indicates that students within the Reserved category exhibited a slightly higher mean rank (M=109.10,n=125) in comparison to those in the Unreserved category (M=101.50,n=86). However, the inferential statistics revealed a U value of 4988.00 and a Z score of -0.89 , with a resulting p-value of .373 (two-tailed). Since the obtained p-value exceeds the standard alpha level of .05, the difference between the two groups is not statistically significant; consequently, the null hypothesis is not rejected. This suggests that, within the context of this study, social category does not act as a determining factor in shaping the cognitive engagement of students.

Building upon these findings, the research further extends its investigation to evaluate the impact of social categories on the perception of behavioral engagement among secondary-level students under the U.P. Board. In alignment with this objective, Null Hypothesis is formulated, asserting that there is no significant impact of social category on the perception of these students toward their behavioral engagement in mathematics. This stage of the analysis seeks to ascertain whether the lack of significant variance observed in cognitive engagement also extends to the behavioral dimensions of student involvement.

Table 4. Behavioral Engagement Rank of Social Category

	Social Category	N	Mean Rank	Sum of Ranks
Behavioral Engagement	Reserved	125	110.48	13810.50
	Unreserved	86	99.48	8555.50
	Total	211		

Table 5. Behavioral Engagement Test Statistics of Social Category

	Behavioral Engagement
Mann-Whitney U	4814.500
Wilcoxon W	8555.500
Z	-1.289
Asymp. Sig. (2-tailed)	.197

Table 6. Social Category Means Rank of Behavioral Engagement

Variable	Social Category	Mean Ranks	N	Mann-Whitney U values	Remark
Behavioral Engagement	Reserved	110.48	125	4814.500	p>.05
	Unreservd	99.48	86		

The analytical results presented in Table 6 further detail the comparative assessment of behavioral engagement between students of the Reserved and Unreserved social categories using the Mann–Whitney U test. The data indicates that students from the Reserved category recorded a higher mean rank (M=110.48,n=125) than those in the Unreserved category (M=99.48,n=86). However, the statistical analysis yielded a U value of 4814.50 and a Z score of -1.29 , with a corresponding p-value of .197. Because this p-value exceeds the .05 significance threshold, the difference is considered statistically insignificant, leading to the conclusion that social category does not substantially influence the behavioral participation of students in mathematics.

Following the examination of behavioral patterns, the investigation proceeded to evaluate how social categories might affect the perception of affective engagement among these secondary-level students. This phase of the study was designed to explore whether emotional responses, such as interest, enthusiasm, and the perceived value of mathematics, differ across social groups. By focusing on this affective dimension, the research aims to identify if social background plays a role in shaping the internal motivation and emotional connection students maintain with the subject, or if these sentiments remain uniform regardless of their social classification.

Table 7. Affective Engagement Rank of Social Category

	Social Category	N	Mean Rank	Sum of Ranks
Affective Engagement	Reserved	125	115.64	14455.50
	Unreservd	86	91.98	7910.50
	Total	211		

Table 8. Affective Engagement Test Statistics of Social Category

	Affective engagement
Mann-Whitney U	4169.500
Wilcoxon W	7910.500
Z	-2.776
Asymp. Sig. (2-tailed)	.006

Table 9. Social Category Means Rank of Affective Engagement

Variable	Social Category	Mean Ranks	N	Mann-Whitney U values	Remark
Affective Engagement	Reserved	115.64	125	4169.500	P<.05
	Unreserved	91.98	86		

The statistical analysis presented in Table 9, utilizing the Mann–Whitney U test, reveals a distinct pattern regarding affective engagement based on social category. Unlike the previous dimensions, the results indicate that students from the Reserved category (M=115.64,n=125) exhibited significantly higher mean ranks compared to those in the Unreserved category (M=91.98,n=86). With a U value of 4169.50 and a Z score of -2.78 , the resulting p-value of

.006 is well below the .05 significance threshold. Consequently, the null hypothesis is rejected, confirming that social category does indeed have a statistically significant impact on the affective engagement of secondary school students in mathematics.

When synthesizing the overall findings of this research, a nuanced picture of student engagement emerges. It is observed that social category does not create a meaningful disparity in the cognitive ($U=4988.00;p=.373$) or behavioral ($U=4814.50;p=.197$) dimensions of mathematics engagement, as both tests failed to reach statistical significance. In these areas, students across different social groups appear to participate and process information with a degree of parity. However, a significant divergence is evident in the affective domain, where students from the Reserved category demonstrate a markedly higher level of emotional connection, interest, and perceived value toward the subject compared to their Unreserved counterparts. This suggests that while classroom actions and cognitive efforts remain consistent, the internal emotional investment in mathematics is influenced by the students' social background.

The second major objective of this research is to investigate whether parental occupation serves as a differentiating factor in the levels of student engagement in mathematics among secondary school students. It is hypothesized that a significant difference exists in how students engage with the subject when categorized by their parents' professional backgrounds. To explore this relationship in greater detail, the study specifically examines the impact of parental occupation on the perception of cognitive engagement among secondary-level students within the U.P. Board. This investigation is guided by a null hypothesis which posits that parental occupation does not exert a significant influence on how these students perceive their cognitive involvement in mathematics. By focusing on this dimension, the research aims to discern whether the socio-economic and professional environment provided by parents correlates with the mental effort and strategic learning behaviors students apply to their mathematical studies.

Table 10. Cognitive Engagement Rank of Parent's Occupation

	Parent's Occupation	N	Mean Rank	Sum of Ranks
Cognitive engagement	White Coller	79	102.68	8112.00
	Blue Coller	132	107.98	14254.00
	Total	211		

Table 11. Cognitive Engagement Test Statistics of Parent's Occupation

	Cognitive engagement
Mann-Whitney U	4952.000
Wilcoxon W	8112.000
Z	-.612
Asymp. Sig. (2-tailed)	.541

Table 12. Parent's Occupation Means Rank of Cognitive Engagement

Variable	Parents' Occupation	Mean Ranks	N	Mann-Whitney U-values	Remark
Cognitive engagement	White Coller	102.68	79	4952.000	p>.05
	Blue Coller	107.98	132		

The analytical data presented in Table 2.3 details the results of the Mann–Whitney U test, which was conducted to determine if there were significant differences in cognitive engagement based on parental occupation, specifically comparing students from white-collar and blue-collar

backgrounds. The results indicated that students from blue-collar families recorded a slightly higher mean rank ($M=107.98, n=132$) than those from white-collar families ($M=102.68, n=79$). However, with a U value of 4952.00 and a Z score of -0.61 , the resulting p-value was .541. Since this p-value is considerably higher than the .05 significance level, the null hypothesis is not rejected, suggesting that parental occupation does not significantly influence how students perceive their cognitive engagement in mathematics.

Following this finding, the study expanded its inquiry to evaluate the potential impact of parental occupation on behavioral engagement. This phase of the research aimed to identify whether students' active participation, persistence, and classroom conduct in mathematics varied according to their parents' professional sectors. By exploring this dimension, the study sought to establish whether the domestic professional environment plays a role in shaping the observable academic behaviors of secondary-level students under the U.P. Board, or if such behavioral patterns remain consistent regardless of whether parents are engaged in white-collar or blue-collar vocations.

Table 13. Behavioral Engagement Rank of Parent's Occupation

	Parent's Occupation	N	Mean Rank	Sum of Ranks
Behavioral engagement	White Coller	79	103.70	8192.00
	Blue Coller	132	107.38	14174.00
	Total	211		

Table 14. Behavioral Engagement Test Statistics of Parent's Occupation

	Behavioral engagement
Mann-Whitney U	5032.000
Wilcoxon W	8192.000
Z	-.425
Asymp. Sig. (2-tailed)	.671

Table 15. Parent's Occupation Means Rank of Behavioral Engagement

Variable	Parents' Occupation	Mean Ranks	N	Mann-Whitney U-values	Remark
Behavioral engagement	White Coller	103.70	79	5032.000	$p > .05$
	Blue Coller	107.38	132		

The statistical evidence presented in Table 2.5 illustrates the results of the Mann-Whitney U test, which was utilized to examine potential disparities in behavioral engagement based on parental occupation. The analysis shows that students from blue-collar families ($M=107.38, n=132$) exhibited a slightly higher mean rank than their peers from white-collar families ($M=103.70, n=79$). However, with a U value of 5032.00 and a Z score of -0.43 , the p-value was calculated at .671. Since this value significantly exceeds the .05 alpha level, the null hypothesis is not rejected, leading to the conclusion that parental occupation does not have a statistically significant impact on the behavioral engagement of students in mathematics.

Building on these findings, the study moved forward to investigate the relationship between parental occupation and affective engagement. This phase of the research focuses on the emotional dimensions of learning, such as students' attitudes, interests, and the value they associate with mathematics. The goal is to determine if the professional background of parents—whether white-collar or blue-collar—influences the students' internal emotional

connection to the subject, or if, like the cognitive and behavioral aspects, this affective dimension remains largely unaffected by the parents' vocational status.

Table 16. Affective Engagement Rank of Parent's Occupation

	Parent's Occupation	N	Mean Rank	Sum of Ranks
Affective engagement	White Coller	79	95.56	7549.50
	Blue Coller	132	112.25	14816.50
	Total	211		

Table 17. Affective Engagement Test Statistics of Parent's Occupation

	Affective engagement
Mann-Whitney U	4389.500
Wilcoxon W	7549.500
Z	-1.928
Asymp. Sig. (2-tailed)	.054

Table 18. Parent's Occupation Means Rank of Affective Engagement

Variable	Parents' Occupation	Mean Ranks	N	Mann-Whitney U-values	Remark
Affective engagement	White Coller	95.56	79	4389.500	p>.05
	Blue Coller	112.25	132		

The statistical analysis presented in Table 2.8, utilizing the Mann–Whitney U test, examined whether parental occupation resulted in significant differences regarding the affective engagement of students. The results indicated that students from blue-collar families ($M=112.25, n=132$) achieved higher mean ranks than those from white-collar families ($M=95.56, n=79$). The test yielded a U value of 4389.50 and a Z score of -1.93 , resulting in a p-value of .054. Although this value is very close to the threshold of significance, it remains greater than the .05 alpha level; thus, the null hypothesis is not rejected, confirming that there is no statistically significant difference in affective engagement based on parental occupation.

Synthesizing the results for this secondary objective, the findings demonstrate that parental occupation does not serve as a significant determinant of student engagement in mathematics across any of the studied dimensions. While it was observed that students from blue-collar backgrounds consistently maintained slightly higher mean ranks in cognitive ($U=4952.00, p=.541$), behavioral ($U=5032.00, p=.671$), and affective ($U=4389.50, p=.054$) engagement, these differences did not reach statistical significance. Consequently, all null hypotheses related to this variable were accepted, and the overarching research hypothesis was rejected. This suggests that the occupational background of parents—whether white-collar or blue-collar—does not inherently create a disparity in how secondary school students engage with mathematics in the U.P. Board context.

Discussions

This study has investigated variations in engagement of the students in math studies in terms of social classification and parents' occupation. According to the results, social classification has no impact on cognitive and behavioral engagement since p-values for both (.373 and .197, correspondingly) are above the level of significance (.05). That means that students belonging to either Reserved or Unreserved social categories engage in mathematics studies equally. Moreover, there is statistically significant ($p=.006$) difference between affective engagement in mathematics studies among the students of the two social categories, with those belonging to

the Reserved category demonstrating more emotional engagement in learning process. On the other hand, parental occupation has no statistically significant impact ($p > .05$ in all three cases) on cognitive, behavioral and affective engagements of students. Nevertheless, students whose parents have blue collar occupations demonstrated higher mean ranks in all the three cases considered in the study.

Such conclusions are supported by multiple earlier studies conducted on the same topic. First, the lack of any significant differences in cognitive and behavioral engagement between social categories corresponds to the results presented by Sirin (2005), who noted that sociological or economic backgrounds have a minor impact on a student's engagement, provided that the educational environment is equal for all participants of learning process. Secondly, there is also no impact of parents' job on a student's engagement, which supports the results reported by Wang and Eccles (2013). Namely, these authors pointed out that motivational and environmental factors play a more critical role than sociological ones. Thirdly, significant differences in affective engagement were partially confirmed by Pekrun (2006). This author paid considerable attention to the emotional aspect of the educational process, which, according to him, can vary from one group of students to another and considerably influence their academic experience. Finally, these findings also correlate with the conclusions made by Fredricks et al. (2004), who claimed that student engagement is multidimensional and therefore, different types of engagement might be influenced by various factors.

Fifthly, the findings differ from researches such as Sirin (2005) as well as some other investigations based on socio-economic status. The absence of any significant variations in this study could be related to contextual aspects including the similarity of school setting, curricula, and the equal availability of classroom resources. Furthermore, the research is in agreement with the findings of Klem and Connell (2004) who state that the creation of an atmosphere within the classroom that supports the relationship between teachers and students reduces the effects of socio-demographic variables on students' engagement.

In conclusion, the above discussion clearly shows that although structural variables such as social class and parents' occupations do not significantly affect cognitive and behavioral engagements of students, affective engagement is important and sensitive. As a result, teachers need to pay more attention to improving students' emotional attachment to math lessons.

CONCLUSION

school students with emphasis on the variable of social category and parents' occupation. Engagement was evaluated in three dimensions which include cognitive, behavioral, and affective engagement using the Mann Whitney U test. Regarding the first research question that sought to find whether there is any significance in student engagement in mathematics with respect to social category, the results show that there is no statistical difference in cognitive and behavioral engagement for students of reserved and unreserved social categories. This implies that the level of engagement, problem solving activity, and on task behaviour in the case of mathematics is comparable regardless of the social background of the students. A statistically significant difference existed in affective engagement for students of reserved social category.

Concerning the second research question, which examined whether a significant difference in engagement can be found between the students depending on their parents' job type, the results suggested that there is no significant difference in terms of students' cognitive, behavioral, and affective engagement. Even though the children whose parents had blue-collar jobs had slightly higher mean ranks, these differences were not statistically significant. Thus, one may conclude that the occupation of the students' parents does not have any significance for their engagement in mathematics.

Generally speaking, the results of the research demonstrate that the structural factors like the social status and the occupational status of the parents do not influence students' cognitive and behavioral engagement in math lessons. On the other hand, affective engagement depends on certain social factors, which means that one should pay attention to the emotional side of learning mathematics. The findings of the study prove that teachers should work on creating a comfortable environment in class and making students more engaged in studying mathematics.

Recommendations for further studies include the use of bigger samples from different locations and educational boards to improve the generalizability of results obtained from research. Other variables that researchers could investigate include self-efficacy, math anxiety, and teaching methods to get a broader picture of the different elements affecting engagement with mathematics among students. Longitudinal designs would be useful when looking at changes in engagement over time, while qualitative research, involving interviews and classroom observations, would be important when trying to understand students' emotions and behaviours during their engagement with mathematics.

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