Self-Esteem and Self-Efficacy as Predictors of Students' Achievement in Mathematics

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Abstract. Students' academic achievement is often attributed to their intellectual quotient. Thus, less emphasis was placed on non-cognitive factors of learning. This research inquiry explores how self-esteem and self-efficacy influence students' academic performance in mathematics. The researcher used a descriptive-correlational research design to achieve the study's objectives. Five hundred fifty-five first-year university students participated in the online survey. The researcher employed various statistical techniques to analyze the data, including frequency count, percentage, mean, standard deviation, Pearson's r Correlation, and Multiple Linear regression. The results revealed that university students had moderate self-esteem, high self-efficacy, and unsatisfactory mathematics achievement. Moreover, the findings suggest that students with high self-esteem and self-efficacy had moderately better mathematics achievement. Finally, regression analysis indicates that students who value themselves and their abilities more had superior mathematics achievement. The theoretical and practical implications of these findings were also discussed. The researcher recommends that school stakeholders collaborate to promote a supportive atmosphere that encourages effort, growth, and learning.

Keywords: Self-Esteem, Self-Efficacy, Student's Achievement, Mathematics

1 Introduction

In today's fast-paced and competitive world, achieving academic success has become an essential student goal. The journey toward educational achievement is marked by various factors that play crucial roles in shaping an individual's path. One crucial area that has received significant attention is the influence of self-esteem and self-efficacy on academic achievement. Understanding the interaction of these psychological factors with student achievement can offer valuable insights for effective educational interventions and strategies to enhance learning outcomes.

Mathematics is uniquely positioned in the curriculum and is often regarded as a challenging subject requiring critical thinking and problem-solving abilities (Arbain & Shukor, 2015; Alvarez & Galman, 2023). Many students experience different levels of anxiety or uncertainty when confronted with mathematical concepts. This un-

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ease can significantly impact their self-esteem, self-efficacy, and academic achievements (Luttenberger, Wimmer, & Paechter, 2018).

Self-esteem is a person's subjective general evaluation of their worth or value (Orth & Robins, 2019). It is a concept that assesses a person's self-worth and capabilities. Morris Rosenberg (1965), a self-esteem expert, defines self-esteem as an individual's attitude toward themselves and their positive or negative self-perception. Individuals with high self-esteem believe that they possess inherent worth and do not engage in negative self-evaluation regarding their deficiencies. Meanwhile, individuals with low self-esteem reject, denigrate, and harshly evaluate themselves (Smedea, 2014). Thus, self-esteem is an interesting psychological concept because it can predict specific outcomes such as academic achievement, happiness, life satisfaction, career success, and criminal behavior (Rubalino et al., 2015; Sato & Yuki, 2014; Orth & Robbins, 2014). It serves as a foundation upon which students build their confidence, motivation, and resilience to overcome challenges encountered during their learning journey. Students with high levels of self-esteem tend to display greater persistence when faced with obstacles or setbacks. They possess a sense of belief in their abilities to master difficult tasks, leading to improved academic outcomes.

Furthermore, Albert Bandura's (1994) concept of self-efficacy refers to an individual's belief in their ability to perform specific tasks and attain desired outcomes. Self-efficacy is important in how students approach and engage with academic tasks in education. Kvedere (2014) asserts that individuals with greater self-efficacy tend to establish more striving objectives, exert greater diligence, and display increased perseverance when confronted with task-related challenges. Those with high self-efficacy set challenging goals, exert effort, and persevere in adversity, leading to improved academic performance. In contrast, individuals with low self-efficacy frequently doubt their abilities and are reluctant to undertake a challenging task (Schunk & DiBenedetto, 2016). They lack the ambition and motivation to pursue their respective objective. Shams et al. (2011) and Jaafar & Ayubb (2010) reached the conclusion that there exists a positive correlation between self-efficacy and performance in mathematics. Once more, these results underscore the importance of self-efficacy in achieving success in mathematics. Understanding and addressing students' self-efficacy can have implications for educational practices, as it suggests that fostering a sense of belief in one's capabilities may positively influence academic outcomes, particularly in subjects perceived as difficult or challenging, like mathematics.

The relationship of self-esteem and self-efficacy to academic achievement, particularly in mathematics, has been studied separately, and less attention has been given to measuring their predictive validity to mathematics achievement. However, the nuances and dynamics of this relationship are complex and multifaceted. Understanding how these psychological constructs interact and influence students' mathematics achievement is paramount for educators, researchers, and policymakers. By examining the interplay and impact of various factors, educational stakeholders can gain valuable insights into effective strategies for enhancing mathematics achievement and cultivating a positive learning environment. Thus, it can offer valuable insights into designing effective educational interventions and support systems to enhance students' success in this critical subject.

Hence, this current research endeavor seeks to (1) describe the students' self-esteem levels, (2) describe the extent of students' self-efficacy, (3) describe the student's academic performance in mathematics, (4) examine the correlation between self-esteem, self-efficacy, and mathematics achievement, and (5) identify the factors that predict mathematics achievement. By addressing these objectives, the study aims to provide insights into the interplay between self-esteem, self-efficacy, and academic success in mathematics, thereby contributing to our understanding of the factors influencing students' performance in this subject.

2 Methodology

2.1 Research Design

The researcher utilized a descriptive correlational research design. The objective of descriptive correlational research is to provide an explanation for the relationship between two or more variables, refraining from establishing causal relationships. It requires collecting and analyzing data on a minimum of two variables in order to establish a relationship between them (Bhat, 2018). The present study used descriptive research to describe the respondents' self-esteem, self-efficacy, and mathematics achievement. Moreover, correlational research was applied to explore the interrelation of the variables. Thus, the descriptive correlational research design appropriately suits the study's objectives.

2.2 Respondents of the study

The study participants comprised 555 first-year students pursuing a degree in teacher education at Nueva Ecija University of Science and Technology (NEUST). The participants were students enrolled in a mathematics course, specifically Mathematics in the Modern World (GENED 4), in the first semester of the academic year 2022-2023. The sample size was determined using the Raosoft Sample Size Calculator, taking into account a 3% margin of error and a 97% confidence level.

2.3 Research Instrument

The researcher used a survey questionnaire to collect the necessary information from the respondents.

Self-Esteem

The Rosenberg Self-Esteem Scale (RSES) by Morris Rosenberg (1965) is a widely used psychological instrument to measure self-esteem, which is the subjective evaluation of one's worth and value. The scale consists of ten statements, five of which are positively worded and five are negatively worded. Respondents indicate their level of agreement or disagreement with each statement on a four-point scale ranging from strongly agree to strongly disagree. An example item is: "On the whole, I am satisfied

with myself." The RSES reported high validity based on various studies. In addition, RSES has a reliability coefficient of 0.92, showing strong internal consistency (Sinclair et al., 2010). The current study reported that self-esteem ($a = .75$) had acceptable internal consistency.

Self-Efficacy

The General Self-Efficacy Scale (GSE) by Schwarzer and Jerusalem (1995) is a tool to assess individuals' beliefs in their ability to cope with various challenging situations in life. The GSE consists of 10 statements, each reflecting a different aspect of self-efficacy. Likert scale, typically ranging from "strongly disagree" to "strongly agree." An example item is: "I can always manage to solve difficult problems if I try hard enough." The scale had good criterion-related validity. According to studies, positive coefficients were found for the scale concerning favorable emotions, dispositional optimism, and job satisfaction. Self-efficacy ($a = .97$) had good internal consistency based on the present study.

Mathematics Achievement

The students' academic performance in mathematics was assessed based on their final grades, which encompassed their performance in exams, quizzes, assignments, practical tasks, and classroom engagement.

2.4 Data Analysis

The present study used descriptive-predictive data analysis to determine the predictors of mathematics achievement using self-esteem and social support. The data gathered through Google Forms were downloaded and analyzed using MS Excel 2019 and SPSS version 23. First, mean and standard deviation were used to describe self-esteem, self-efficacy, and mathematics achievement.

The subsequent section provided the scoring guide and interpretation utilized to ascertain the students' self-esteem. Five distinct intervals of interpretation comprise the self-esteem scale:

Table 1. Scoring guide and interpretation for students' self-esteem

Self-Esteem		
Interval	**Descriptive Level**	**Interpretation**
3.41 – 4.00	Very High Self-Esteem	Students possess a strong sense of self-worth and self-confidence.
2.81 – 3.40	High Self-Esteem	Students generally hold themselves in high regard and feel confident in their abilities.
2.21 – 2.80	Moderate Self-Esteem	Students likely have a balanced view of themselves and their capabilities.
1.61 – 2.20	Low Self Esteem	Students may struggle with self-doubt and have a negative perception of themselves.
1.01 – 1.60	Very Low Self Esteem	Students may experience significant self-doubt, lack confidence, and have a poor self-image.

The scoring guide and interpretation for students' self-efficacy are provided below. The level of self-efficacy is divided into five interpretative intervals:

Table 2. Scoring guide and interpretation for students' self-efficacy

Self-Efficacy		
Interval	**Descriptive Level**	**Interpretation**
3.41 – 4.00	Very High Self-Efficacy	Students are likely to believe strongly in their ability to accomplish tasks and achieve goals effectively.
2.81 – 3.40	High Self-Efficacy	Students typically have a confident outlook on their capabilities and feel competent in various situations.
2.21 – 2.80	Moderate Self-Efficacy	Students may have reasonable confidence in their abilities, which may vary depending on the task or situation.
1.61 – 2.20	Low Self-Efficacy	Students may doubt their ability to perform well and feel inadequate in many situations.
1.01 – 1.60	Very Low Self-Efficacy	Students may lack confidence in their abilities and perceive themselves as highly ineffective in achieving their goals.

Their final grades were interpreted using the given interval below.

Table 3. Scoring guide and interpretation for students' mathematics achievement

Grade	Grading Scale	Verbal Description
1.25- 1.00	94-100	Outstanding
1.75 - 1.50	88-93	Very Satisfactory
2.25 - 2.00	82-87	Satisfactory
2.75 – 2.50	76-81	Unsatisfactory
3.00 – 5.00	75 and below	Poor

Pearson's Correlation Coefficient (Pearson's r) was also used for the correlation analysis. Finally, Multiple Linear Regression was used to determine the predictors of academic achievement in mathematics.

2.5 Ethical Consideration

Several ethical considerations were taken into account by the researchers during the data collection process. The researchers first explained the purpose of the current study and then requested permission and consent from the respondents. Respondents participated voluntarily and could withdraw from the study if desired. Furthermore, it was stated that the data and information gathered would be treated with the utmost confidentiality following the Philippines Data Privacy Act of 2012. Lastly, no harm or risk was identified during the study.

3 Results and Discussion

3.1 Description of Students' Level of Self-Esteem

The table below describes students' level of self-esteem.

Table 4. Students' Level of Self-Esteem

Self-Esteem	M	SD	VD
1. On the whole, I am satisfied with myself.	2.88	0.65	High Self-Esteem
2. At times I think I am no good at all. *	2.09	0.66	Low Self-Esteem
3. I feel that I have a number of good qualities.	2.86	0.56	High Self-Esteem
4. I am able to do things as well as most other people.	2.89	0.56	High Self-Esteem
5. I feel I do not have much to be proud of. *	2.47	0.69	Moderate Self-Esteem
6. I certainly feel useless at times. *	2.28	0.70	Moderate Self-Esteem
7. I feel that I'm a person of worth.	3.03	0.61	High Self-Esteem
8. I wish I could have more respect for myself. *	1.80	0.66	Low Self-Esteem

Self-Esteem	M	SD	VD
9. All in all, I am inclined to think that I am a failure. *	2.55	0.70	Moderate Self-Esteem
10. I take a positive attitude toward myself.	3.21	0.59	High Self-Esteem
Overall Mean	**2.61**	**0.35**	**Moderate Self-Esteem**

*Note: * reverse scoring was applied*

The table presents the data indicating that the average self-esteem is 2.61, with a standard deviation of 0.35. This value corresponds to a moderate degree of self-esteem. In particular, item 10 achieved the highest mean score of 3.21 and a standard deviation of 0.59. This score is defined verbally as indicative of high self-esteem. The results suggest that most students agreed with this statement, indicating that they generally hold a positive attitude toward themselves. In addition, item 7 (M = 3.03, SD = 0.61) and statement 4 (M = 2.89, SD = 0.56) also had a high mean score. These two items suggest that most students perceived themselves as worthy and capable.

On the contrary, item 8 exhibited the least mean score of 1.81, accompanied by a standard deviation of 0.66, denoting low self-esteem. The results suggest that some students feel they need more self-respect. Likewise, item 2 (M = 2.09, SD = 0.66) had a low mean rating and was described as having low self-esteem. As a result, some students experience self-doubt and negative self-evaluations.

The data suggests that most students had moderate self-esteem, meaning they generally have positive views of themselves but may sometimes experience self-doubt and negative thoughts. Basco and Han (2016) discovered that most university students possessed a moderate degree of self-esteem; the findings corroborated this conclusion. According to Firestone (2017), the healthiest form of self-esteem is moderate self-esteem, which is established upon recognizing one's intrinsic value rather than excessive comparison to others. Excessively elevated self-esteem may be associated with narcissistic tendencies, whereas insufficient levels of self-esteem may correlate with social anxiety, diminished confidence, and depression. The analysis infers that students with moderate self-esteem typically have a balanced view of themselves, recognizing their strengths and weaknesses without overly negative or positive self-evaluations. They recognize their shortcomings and try to improve themselves while simultaneously appreciating their strengths. Students with moderate self-esteem can often bounce back from setbacks and failures, cope with stress and challenges, and are not easily discouraged by setbacks.

As per the American Psychology Association (2020), self-esteem refers to the extent to which students feel content with themselves and perceive themselves as valuable and deserving of respect. Students must have both self-esteem and perceived competence because it enables them to take learning risks and recover from failure or difficult situations. Conversely, suppose students lack confidence or have low self-esteem. Under such circumstances, individuals might question their ability to achieve success, leading them to hesitate to participate in learning activities or take necessary academic challenges to enhance their skills. Building self-esteem typically involves

performing tasks and achieving goals considered admirable, even small accomplishments.

3.2 Description of Students' Extent of Self-Efficacy

Table 5 presents the students' core self-evaluation in terms of their level of self-efficacy.

The table shows that the overall mean self-efficacy is 2.98, with a 0.51 standard deviation, which is described as a high level of self-efficacy. Moreover, the item with the highest mean score among students is item 6, recording a mean score of 3.20 and a standard deviation of 0.68, indicating a verbally described high level of self-efficacy. The high mean score for item 6 may suggest that the students are generally confident in their problem-solving ability, which could positively affect their academic or work performance. Moreover, it is followed by item 5 (M = 3.05, SD = 0.72), with a verbal description of high self-efficacy. On average, students agree with this statement, suggesting that they have a high level of confidence in their ability to handle unforeseen situations by utilizing their resourcefulness.

Table 5. Students' Level of Self-Efficacy

Self-Efficacy	M	SD	VD
I can always manage to solve difficult problems if I try hard enough	2.99	0.77	High Self-Efficacy
If someone opposes me, I can find the means and ways to get what I want.	2.90	0.76	High Self-Efficacy
It is easy for me to stick to my aims and accomplish my goals.	2.97	0.77	High Self-Efficacy
I am confident that I could deal efficiently with unexpected events.	2.85	0.79	High Self-Efficacy
Thanks to my resourcefulness, I know how to handle unforeseen situations.	3.05	0.72	High Self-Efficacy
I can solve most problems if I invest the necessary effort.	3.20	0.68	High Self-Efficacy
I can remain calm when facing difficulties because I can rely on my coping abilities.	2.98	0.78	High Self-Efficacy
When I am confronted with a problem, I can usually find several solutions.	2.95	0.75	High Self-Efficacy
If I am in trouble, I can usually think of a solution	2.99	0.74	High Self-Efficacy
I can usually handle whatever comes my way.	2.92	0.79	High Self-Efficacy
Overall Mean	**2.98**	**0.51**	**High Self-Efficacy**

Meanwhile, the lowest relative mean score of the students is item 4, with a mean of 2.85 and a standard deviation of 0.79. Still, it can be described verbally as high self-efficacy. So, the mean rating indicates that students may view themselves as less

capable of handling unforeseen situations, which could cause concern. Overall, the mean scores for all ten items range from 2.85 to 3.20, indicating that respondents generally agree with the statements and have high levels of self-efficacy.

Overall, the data reveals that most student respondents had a high level of self-efficacy. The findings imply that the students are confident in their capacity to solve problems, accomplish goals, deal with unforeseen events, and deal with whatever comes their way. The results were consistent with the research of Vergara (2018), wherein most university students had a great extent of self-efficacy toward learning mathematics. Hence, students have a positive view of their ability to handle challenging situations and achieve their goals, indicating high self-efficacy. In addition, it may benefit their academic performance and general well-being, as individuals with high self-efficacy are more likely to set and achieve challenging goals, persevere in the face of obstacles, and experience less stress and anxiety.

According to Bandura's social cognitive theory, self-efficacy is the individual's perceived capabilities for learning or performing actions at designated levels, and it is a critical cognitive variable that influences motivation and engagement. A high sense of self-efficacy has favorably influenced learning, achievement, self-regulation, and motivational outcomes, such as individuals' activity preferences, effort, persistence, and interests (Schunck & Mullen, 2012).

Students exhibit high confidence in their ability to solve mathematical problems. Additionally, they hold optimistic beliefs regarding their capability to perform specific academic tasks. Students with elevated levels of self-efficacy set ambitious goals, invest more effort, persevere in the face of challenges, and are inclined to utilize self-regulated learning strategies (Kvedere, 2014). Those with a robust sense of self-efficacy approach their math lessons and assignments diligently to pursue their learning objectives. Furthermore, they demonstrate a strong commitment to successfully completing tasks, showing resilience in the face of setbacks and maintaining steadfast dedication towards their goals. Similarly, students with exceptionally high levels of self-efficacy exhibit these characteristics to an even greater extent and with more sophistication.

Only a minority of student respondents display a lack of self-efficacy, which is a positive outcome indicating that a small proportion of students lack confidence in their learning abilities and performance. Consequently, students with low self-efficacy often struggle with confidence issues, reluctance to tackle challenging tasks, limited aspirations, and a lack of commitment to achieving their objectives.

3.3 Description of Students' Level of Mathematics Achievement

The student's level of academic achievement in mathematics was described using their final grades in mathematics. It includes their performance in examinations, quizzes, activities, performance tasks, and class participation.

Table 6. Student Extent of Level of Mathematics Achievement

Level of Mathematics Achievement	Grades	Equiv	f	%	Mean	SD	VD
Outstanding	1.25 - 1.00	94 - 100	14	2.52			
Very Satisfactory	1.75 - 1.50	88 - 93	96	17.30			
Satisfactory	2.25 - 2.00	82 - 87	158	28.47	2.41	0.63	**Unsatisfactory**
Unsatisfactory	2.75 - 2.50	76 - 81	177	31.89			
Poor	3.00 - 5.00	≤ 75	99	17.84			
Incomplete	INC	INC	11	1.98			
Total			555	100			

The data reveals that students-respondents have different mathematics achievement levels, ranging from poor to outstanding. In particular, only 2.52% of the students attain a final grade between 1.25 to 1.00 with a verbal description of outstanding, 17.30% obtain grades between 1.75 to 1.50 rated as very satisfactory, and 28.47% accomplish grades between 2.25 to 2.00, described as satisfactory. In contrast, 31.89% only achieve grades between 2.75 to 2.50 with a description of unsatisfactory, 17.84% obtain grades between 3.00 to 5.00, described as poor, and 1.98% have incomplete ratings in mathematics.

The average mathematics achievement is deemed unsatisfactory, as indicated by the mean score of 2.41 (82.40) and the standard deviation of 0.63. This means that most students performed unsatisfactorily in mathematics and experienced challenges in learning it. While some students excel in mathematics, a considerable number of students are performing at a satisfactory or unsatisfactory level, and a portion is struggling with poor performance. The results were comparable to the research findings of Andaya (2014), wherein findings reveal that the mathematics achievement of education students is poor. Their analysis points out that poor student performance can be primarily attributed to four factors: individual (student), instructional (teacher), classroom management, and evaluation.

3.4 Relationship of Self-Esteem and Social Support to Mathematics Achievement

Table 7 shows statistical analysis to determine the relationship of self-esteem and self-efficacy to mathematics achievement. In addition, the researcher employed Pearson's r correlation coefficient to test the hypothesis with a 5% significance level.

Table 7. Relationship Between Students' Social Support and Mathematics Achievement

	Variables	1	2	3
1.	Self-Esteem	1		
2.	Self-Efficacy	.333**	1	
3.	Mathematics Achievement	.431**	.110*	1

Note: $** p < 0.01, * p < 0.05$

The analysis reveals that self-esteem (r = .431, p < .01) and self-efficacy (r =.110, p = .009) had a substantial correlation with mathematics achievement. Moreover, self-esteem and self-efficacy had a significant correlation, r = .333, p < .01. Hence, it can be gleaned that students with higher self-esteem and self-efficacy had greater mathematics achievement.

Self-esteem is an individual's perception of overall worth and value. In the analysis, higher self-esteem indicates that students have a favorable impression of their abilities and self-worth, which may lead to improved mathematics achievement. The substantial, moderate, positive association suggests that learners with higher self-esteem are more likely to have confidence in their mathematics problem-solving and persistence abilities. This confidence can contribute to a more favorable attitude toward mathematics, enhanced learning motivation, and participation in math-related activities. The findings align with the research conducted by Govindarajan (2013) & Arshad et al. (2015), which suggests a significant correlation between self-esteem and mathematics achievement. Self-esteem emerges as a pivotal factor influencing an individual's academic success. The extent to which a student's self-esteem is impacted by their academic performance hinges on their perception of their own worth and accomplishments. In cases where students struggle academically, failure can exacerbate avoidance behaviors, leading to dissatisfaction, boredom, and potential conflicts with instructors and parents.

Self-efficacy refers to a person's confidence to complete tasks and attain objectives. Higher self-efficacy shows that students are more confident in solving mathematical problems and overcoming adversity. The positive association suggests that students with higher self-efficacy are more likely to approach mathematics with a can-do attitude, persevere through challenges, and actively learn mathematics. These findings support the results of previous studies by Negara et al. (2021) & Zakariya (2022), which indicate a positive relationship between the two variables. High mathematics self-efficacy is connected with excellent mathematical performance, whereas low mathematics self-efficacy is associated with poor mathematical performance. Students with strong self-efficacy believe they can rely on their ability in mathematics, perform well in completing homework, and cope with the online learning environment. Performance on mathematics assessments and course outcomes are associated with various aspects of mathematics self-efficacy, including mastery experiences, observational learning, social encouragement, and physiological states. It is essential to design the mathematics curriculum and instructional materials to enable students to

engage in more mastery experiences, enhancing their mathematics self-efficacy and improving their mathematical performance. Moreover, educators should create opportunities within the classroom for students to experience success more frequently. These positive experiences enhance students' mathematical achievement and play a crucial role in shaping their beliefs about their ability to succeed in mathematics (Özcan & Kültür, 2021).

3.5 Self-Esteem and Self-Efficacy as Predictors of Mathematics Achievement

The present study investigates whether self-esteem and self-efficacy significantly predict mathematics achievement among university students. The researcher used multiple linear regression to test the hypothesis with a 5% significance level.

Table 8. Core Self-Evaluations and Social Support as Predictors of Mathematics Achievement

Variable	B	SE	β	t	p'	R^2 Adjusted	F	p
Self-Esteem	7.157	.657	.443**	10.89	.000	.187	63.40	.000
Self-Efficacy	-.414	.450	-.037	-0.037	.411			

$Note$: $** p < 0.01, * p < 0.05$

Table 8 presents the regression analysis to determine the predictors of mathematics achievement using self-esteem and self-efficacy. Results show that self-esteem and self-efficacy explain 18.7% of the variance, F = 63.40, p < .01, indicating that self-esteem and self-efficacy significantly affect mathematics achievement. The statistics reveal that self-esteem (β = .443, t = 10.89, p' < .01) positively predicts mathematics achievement. Meanwhile, self-efficacy (β = -.037, t = -.037, p' > .05) did not significantly predict mathematics achievement. Therefore, the analysis denotes that students who value their worth and abilities are likelier to achieve better in mathematics. These findings highlight the importance of self-esteem in mathematics achievement.

These findings are in line with previous research indicating that self-esteem plays a crucial role in predicting mathematics performance. Ugwuanyi, Okeke, & Asomugha (2020) investigated the relationship between learners' emotional intelligence, self-efficacy, self-esteem, and mathematics achievement. The outcomes suggest that self-esteem exerted considerable predictive effects on student's academic performance in mathematics, emerging as a key determinant of their success. The analysis underscores the importance of enhancing students' self-esteem by adopting effective teaching practices, which can lead to enhanced academic achievement. Furthermore, Saadat, Ghasemzadeh & Soleimani (2012) and Topçu & Marilena (2016) found that academic self-esteem had a meaningful, direct, and positive relationship with students' academic achievement. Academic self-esteem is the understanding of one's value as a student. Thus, it can be concluded that as a person's academic self-esteem

increases, they will strive to accumulate more and more academic achievements. Higher self-esteem is associated with better student academic success. Therefore, using instructional strategies involving extensive teacher feedback may help students develop a stronger sense of their abilities and a more positive outlook on their achievements (Hyseni Duraku & Hoxha, 2018).

Nonetheless, self-efficacy did not emerge as a significant predictor of mathematics achievement, indicating that it did not exert notable effects on performance in the subject. This finding contradicts earlier research by Lee et al. (2014) & Skaalvik et al. (2015), which suggested that self-efficacy directly and indirectly influences students' academic motivation and achievement. Therefore, further investigation into how self-efficacy can effectively contribute to enhancing students' motivation and achievement is crucial.

4 Conclusion

The study's results led to the following conclusions.

1. The students have positive views of themselves but sometimes experience self-doubt and negative thoughts when learning mathematics.
2. The students demonstrate confidence in their ability to solve problems, achieve goals, and confront challenges within the realm of mathematics learning.
3. Most students performed poorly in mathematics and encountered difficulties learning mathematics.
4. The students with high self-esteem and self-efficacy had better mathematics achievement.
5. The students who value their worth and abilities had higher academic achievements in mathematics.

5 Recommendations

In light of the findings and conclusions presented, the following recommendations are proposed: on the findings and conclusion presented, the following recommendations are suggested:

1. Teachers may establish a classroom culture that values effort, growth, and learning rather than focusing solely on grades or performance.
2. Educators can foster a nurturing environment in which students feel comfortable asking questions, making errors, and gaining insights from them.
3. Teachers may provide positive and constructive feedback highlighting students' progress and strengths.
4. Guidance counselors may provide intervention to challenge students to improve their well-being and academic achievement.
5. Future researchers are encouraged to conduct similar studies. This will further validate and establish the reliability of the study findings.

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