**The Relationship Between Students' Attitudes Towards Mathematics and Academic Performance in the Subject**

**Abstract**

This study investigated the relationship between students’ attitudes toward mathematics and their academic performance in the subject. Addressing the persistent challenge of low mathematics achievement in the Philippines, particularly in Davao City, this research examined how attitudinal factors, including interest, confidence, anxiety, and perceived usefulness, correlated with performance and were grounded in Victor Vroom’s Expectancy Value Theory. A descriptive-correlational design was employed, involving 100 high school students from Paradise Embac National High School. Data were collected using the Attitude Towards Mathematics Inventory (ATMI) and students’ final mathematics grades. Findings indicated moderate overall attitudes toward mathematics, with high perceived usefulness but low interest, confidence, and elevated anxiety. A significant positive correlation (R = 0.990, p=0.000) was found between attitudes and academic performance. These results highlight the need to cultivate positive attitudes and reduce anxiety to improve mathematics achievement, contributing to educational development in the region.

*Key Words: Relationship of Students' Attitudes and Academic Performance in the Subject*

**Introduction**

Mathematics performance has been a persistent challenge in educational systems worldwide, including the Philippines. Students’ poor performance in mathematics often stems from a combination of cognitive and attitudinal factors, with negative attitudes such as anxiety, lack of confidence, and disinterest significantly hindering engagement and achievement (Aikenhead, 2020). These negative attitudes can prevent students from grasping mathematical concepts, leading to sustained academic struggles (Cai et al., 2017).

Globally, low mathematics performance is evident in international assessments. In the 2022 Programme for International Student Assessment (PISA), 76% of Filipino students scored below Level 2 in mathematics, indicating limited proficiency in basic skills (OECD, 2023). This issue is not unique to the Philippines, as many countries face similar challenges, particularly among disadvantaged students (Bernardo et al., 2022). These trends underscore the importance of addressing both instructional quality and students’ attitudes toward mathematics.

In the Philippines, national assessments, such as the National Achievement Test (NAT), have consistently shown poor mathematics performance among high school students. According to the Department of Education (DepEd), the 2019 NAT results indicated that Grade 10 students scored an average of 39.5% in mathematics, far below the desired proficiency level (DepEd, 2020). Despite intervention programs, progress remains limited. Galabo, Abellanosa, and Gempes (2018) found that public school students in Davao City exhibited significant gaps in basic mathematical competencies, reflecting national trends.

In Davao City, local studies mirror these findings. Galabo et al. (2018) reported that students in Cluster 6 Tugbok Secondary Schools demonstrated low mathematics readiness, with most failing to meet grade-level competencies. The Davao City Division ranked among the lowest-performing divisions in Region XI (DepEd Region XI, 2019). Additionally, a study by Reyes and Castillo (2023) in the Davao Region identified a strong correlation between students’ attitudes toward mathematics and their performance during the shift to online learning, emphasizing the role of attitudes in academic outcomes.

The need to do this research is brought about by the increasing alarm over the poor performance of students in mathematics, especially in Davao City. Unless their negative attitudes towards mathematics are rectified, students can continue to lose interest in the subject, and subsequently, they will maintain persistently poor academic achievement. This can create a domino effect: students will acquire math anxiety, shy away from math courses or math-related careers, and eventually restrict future possibilities in fields that demand mathematical and analytical capabilities.

This study aimed to determine the extent to which students’ attitudes toward mathematics influence their academic performance. Specifically, it sought to answer the following questions:

1. What is the level of the attitude of the students towards mathematics in terms of interest, anxiety, confidence,

and perceived usefulness, and level of academic performance in mathematics?

2. Is there a significant relationship between students' attitudes toward mathematics and their academic performance in the subject?

**Ho₁:** There is no significant relationship between students’ attitudes toward mathematics and their academic performance.

**Theoretical Framework**

This research is anchored on the Expectancy Value Theory by Victor Vroom (1964), which explains how students' motivation influences academic performance in mathematics. The theory suggests that students are more likely to perform well if they believe their effort (positive attitude) will lead to good performance (expectancy), that good performance will lead to desirable outcomes (instrumentality), and that these outcomes are valuable to them (valence).

Expectancy [Value Theory](https://www.sciencedirect.com/topics/economics-econometrics-and-finance/value-theory) postulates that motivation for a given [behavior](https://www.sciencedirect.com/topics/neuroscience/behavior-neuroscience) or action is determined by two factors: first, expectancy it is that a wanted (instrumental) outcome is achieved through the behavior or action; second, value that the [individual values](https://www.sciencedirect.com/topics/economics-econometrics-and-finance/individual-value) the desired outcome. Expectancy value theories explain the development of motivation essentially as the result of two factors, namely expectancies about the performance of an activity and expectancies about the value of the activity’s outcomes (B. Studer & S. Knecht, 2016)

**Conceptual framework**

The conceptual framework of this study illustrates the relationship between students’ attitudes toward mathematics and their academic performance.

**Independent Variable** **Dependent Variable**

**Academic Performance**

* Grades in General Mathematics

**Students’ Attitudes Toward Mathematics**

* Interest
* Anxiety
* Confidence
* perceived usefulness

Fig 1- **The above picture shows the Independent and Dependent variables**

Attitudes include components such as interest, anxiety, confidence, and perceived usefulness. These components collectively influence students' engagement, motivation, and performance outcomes in mathematics.

**Method**

This research employed a descriptive-correlational design to examine the correlation between the attitudes of students toward mathematics and their performance. This design enabled both attitudinal data and academic records to be gathered to ascertain any possible correlations.

This study focused on Paradise Embac National High School students during the academic year 2024–2025. It did not account for other factors affecting academic performance such as teaching quality, socio-economic status, or parental involvement. The study was limited to assessing attitudes and academic performance using standardized survey instruments and mathematics grades.

The findings of this research were expected to impact students, teachers, administrators, and policymakers in education. Students were expected to gain increased knowledge on how their attitude impacted their performance, while teachers could formulate plans for developing a good attitude. Policymakers and administrators might have used the findings to establish support programs aimed at raising student achievement levels in mathematics.

The study was conducted in selected high schools within the School of Paradise Embac National High School, one of the schools of Cluster XIII of Davao City Division, where students from Grades 9 to 10 were surveyed and assessed for their mathematics performance. The participants of this research were approximately 100 high school students who were selected via stratified random sampling to provide representation from various year levels and academic tracks.

A standardized Attitude Towards Mathematics Inventory (ATMI) was employed to assess students' attitudes, and academic achievement was measured through students' final school grades in mathematics for the current year.

The independent variable, students’ attitudes toward mathematics, was measured across dimensions such as enjoyment, value, motivation, and anxiety. The dependent variable, academic performance, was taken from students’ final report card grades in mathematics. These scores were classified according to performance bands.

Permission was obtained from school administrators, and consent forms were distributed to students and parents. Data were collected via online and paper surveys during scheduled class hours. Academic records were obtained from school registrars upon approval. The study used descriptive statistics (mean and standard deviation) to summarize the data. Pearson’s correlation coefficient was applied to determine the relationship between attitude and academic performance.

Things considered included: First, informed consent was secured from participants and guardians. Second, the anonymity of responses was strictly maintained. Third, participants were allowed to withdraw at any stage without penalty. Next, the data were used solely for academic research purposes. Lastly, results were shared with the school in aggregate form only.

**Results**

Table 1: Level of attitude and academic performance

|  |  |  |  |
| --- | --- | --- | --- |
| **Attitude towards Mathematics** | **Standard Deviation** | **Mean** | **Verbal Description** |
| **Attitude towards Mathematics** | **1.21** | **2.81** | **Moderate** |
| Interest in Mathematics | 1.16 | 2.96 | Low |
| Confidence in Learning Mathematics | 1.37 | 2.81 | Low |
| Mathematics Anxiety (reverse Score) | 1.43 | 2.43 | Low |
| Math Usefulness  **Academic Performance** | 1.18  **7.23** | 3.05  **84.13** | High  **Satisfactory** |

The descriptive statistics reported in Table 1 provide a complete picture of students' affective stance towards mathematics and their related learning achievements. The aggregate attitude score of 2.81 (SD = 1.21), which falls within the "Low" category, indicates that students tend to have negative or neutral attitudes towards mathematics. This result is in line with national trends in the Philippines, wherein mathematics is stereotypically viewed as a challenging and anxiety-provoking subject (Bernardo et al., 2022; Reyes & Castillo, 2023).

Of the four attitudinal factors, mathematical interest had the highest mean score of 2.96 (SD = 1.16) but was still in the "Low" category. This suggests that there are students who enjoy mathematics, but the general degree of interest is not high enough to support long-term academic motivation. This is supported by the conclusion of Ubat et al. (2024), which indicated that moderate interest in mathematics in junior high school students was positively correlated with performance but not significantly. Interest tends to be influenced by teaching practices, classroom environment, and perceived use value of material (Lee et al., 2019).

Confidence in learning mathematics, with a mean of 2.81 (SD = 1.37), mirrors the overall attitude score and reinforces the notion that students lack self-assurance in their mathematical abilities. Low confidence can lead to avoidance behaviors, reduced persistence, and diminished performance (Gjicali & Lipnevich, 2021). The relatively high standard deviation suggests that confidence levels vary widely among students, possibly influenced by prior experiences, teacher feedback, and peer comparisons.

The mathematics anxiety dimension, reverse scored, had the lowest mean at 2.43 (SD = 1.43), which means anxiety is a strong emotional barrier to the development of positive attitude. This confirms Schukajlow et al. (2017), who further asserted that not only does anxiety debilitate motivation but also interferes with cognitive processing during problem-solving. High scores variability in anxiety indicates that although some students manage well, others have debilitating stress that compromises their study engagement.

Conversely, the perceived usefulness of mathematics was highly rated, with a mean of 3.05 (SD = 1.18). This indicates that students appreciate the applied significance of mathematics in daily life and their future careers, although they may have affective difficulties with the subject. This rational appreciation mirrors the "valence" element of Expectancy Value Theory (Vroom, 1964), the idea that students will exert effort toward activities that they find valuable. But the lack of matching between perceived usefulness and affective readiness (interest, confidence, anxiety) suggests that value alone cannot motivate performance unless in the presence of positive affective dispositions (Steinmayr et al., 2019).

Scholastic performance, as assessed by final grades, recorded a mean of 84.13 (SD = 7.23), which falls under the "Satisfactory" classification. Although this indicates that students are performing to minimum standards, the comparatively high standard deviation indicates wide differences in achievement. These differences can be explained by variations in attitudinal factors, specifically confidence and anxiety. Those with greater confidence and less anxiety tend to participate actively and endure difficulties, achieving improved results (Capuno et al., 2019; Mazana et al., 2023).

Combining these findings highlights the interrelated role of cognitive knowledge and emotional investment in mathematics learning. Although students recognize the value of mathematics, low interest, low confidence, and high anxiety prevent them from putting that knowledge into practice in the form of regular academic achievement. Overcoming these affective obstacles through specific interventions—e.g., building confidence, reducing anxiety, and interest-based teaching—could result in better and more equitable performance.

Table 2: Test of the Relationship

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Independent Variable** | **Academic Performance in Mathematics** | | | |
| **r-value** | **p-value** | **Decision on Ho** | **Interpretation** |
| Attitude Towards Mathematics | 0.990 | 0.000 | Rejected | Significant |

According to Table 2: Test of the Relationship, the findings of the Pearson correlation analysis indicate a strong and statistically significant relationship between students' attitudes towards mathematics and their performance.

The independent variable—Attitude Towards Mathematics—had an r-value of 0.990, with a p-value of 0.000. This r-value is extremely high, showing a very strong positive linear correlation between the two variables. Practically speaking, this indicates that as students' attitudes towards mathematics get better—whether through more interest, confidence, less anxiety, or more faith in its usefulness—their performance in school in the subject tends to follow suit.

The 0.000 p-value guarantees that this relationship is statistically significant at any level conventionally used (e.g., 0.05, 0.01, or 0.001), i.e., the probability that this outcome has been produced by chance is effectively nil. As a result, the null hypothesis (Ho) asserting that there is no relationship between students' attitudes and their performance was rejected.

This result is consistent with existing research like the studies of Capuno et al. (2019) and Cerbito (2020), which highlighted that students' motivation, enjoyment, and confidence in math are good predictors of attainment. It also supports the theoretical basis of Victor Vroom's Expectancy Value Theory, which posits that students' perception of a task's value and their confidence to succeed affect effort and results directly.

Overall, the statistics in Table 2 offer powerful evidence that attitude is not an indirect factor—it is a prime motivator of mathematical success. This highlights the need to encourage positive dispositions towards the subject through active teaching, emotional support, and connection to the lives of students.

**Discussion**

This study's results present a rich and complex picture of students' attitudes towards mathematics and their performance. Although students are clearly aware of the relevance and utility of mathematics, interest, confidence, and anxiety levels continue to be low, with an apparent disconnection between intellectual appreciation and emotional investment. This is more than a pedagogical issue—it is a motivational and psychological hurdle that has the potential to significantly detract from students' long-term participation and achievement in mathematics education.

The data indicate that students evaluated perceived usefulness of math highly, revealing they recognize its utility in everyday situations and subsequent career opportunities. This is consistent with the "valence" element of Victor Vroom's Expectancy Value Theory, which suggests that people will apply more effort when they perceive a positive value for the anticipated outcome. Here, students value mathematics, but their low expectancy—is manifested in low confidence and high anxiety—negatively affects their motivation to learn mathematics in depth.

This effect is also reflected in the research of Moussa and Saali (2022), whereby they discovered that students tend to enjoy mathematics cognitively but do not have emotional investment and self-efficacy. Their study highlighted that although students have an appreciation for the role of mathematics, they quite often feel inadequate and fearful, which discourages them from engaging actively in learning activities. This emotional disengagement may contribute to avoidance behaviors, lower persistence, and eventually lower academic performance.

The extremely strong correlation between attitude and performance in this study (r = 0.990, p = 0.000) supports the primacy of affective considerations in achievement. This correlation is not merely statistically significant but also pedagogically informative. It indicates that students' motivational and emotional orientations toward mathematics are not secondary—they are central determinants of success. This result aligns with the study of Capuno et al. (2019), which stressed that motivation and perceived value are high indicators of mathematics performance. It was illustrated in their study that students who were motivated and who had a perceived value of mathematics as important would perform better, irrespective of their initial competence.

Likewise, Cerbito (2020) and Abalde & Oco (2023) emphasized the significance of enjoyment and confidence in influencing academic performance. Through their study, they established that students who enjoy math and are confident in their performances tend to take up the subject, resist difficulties, and record better scores. These results emphasize the need to develop learning environments that enhance positive emotions and self-efficacy.

The influence of mathematics anxiety in this dynamic is too great to be overestimated. In the current research, anxiety was the lowest-rated attitudinal factor, which means that it is a considerable obstacle to the formation of positive attitude. This concurs with the work of Schukajlow et al. (2017), who illustrated that affective states like anxiety and boredom dampen motivation and lower learning efficiency. Their work highlighted that anxiety not only influences students' willingness to participate but also constrains their cognitive processing when solving problems. This two-pronged effect—emotional and cognitive—render anxiety an especially negative factor in mathematics learning.

The variance in performance outcomes, as reflected by the standard deviation of educational achievement scores, further demonstrates the effects of attitudinal variations. Students who are more confident and less anxious perform better, whereas students with unfavorable dispositions fail to deliver desired results. This is confirmed by Hwang and Son (2021), who concluded that students with positive attitudes outperform their counter-act counterparts all the time, even if initial knowledge levels are the same. Their research highlighted that attitude is not an indicator of previous performance—it is a harbinger of future achievement.

The implications of these results are significant. They indicate that mathematics performance can be improved by means that go beyond curriculum reform or more instructional time. It calls for an all-encompassing approach with which to address the emotional and motivational needs of students. This entails ways of developing confidence, minimizing anxiety, and maximizing interest through meaningful and relevant instruction.

For instance, Mazana et al. (2023) found that reducing stress and increasing fun are among the factors that lead to better attitudes and grades. Their research suggested incorporating interactive learning approaches like gamification, co-learning, and application of math in everyday life to render mathematics more understandable and appealing. These not only improve cognitive knowledge but also encourage positive emotional experiences, which are essential for long-term engagement.

The results also inform the wider literature in student-centered learning, highlighting the value of differentiated instruction to respond to the various needs of learners. Lim and Chapman (2015) recommended that diagnostic assessments be used to measure students' attitudes and adapt teaching approaches to the findings. Through the identification of students experiencing confidence or anxiety, teachers can offer well-intentioned support in the form of peer mentoring, personalized feedback, and stress-reduction strategies.

In addition, the findings of the present study are congruent with the framework of social-emotional learning (SEL) as it stresses the acquisition of self-awareness, self-management, and relationship skills. Combining SEL with mathematics education can enhance students' resilience, regulate anxiety, and create a growth mindset.

This is supported by Rogers and Van Horne (2019), who discovered that the more self-efficacious and emotionally regulated students are, the better they will perform academically.

In support of classroom strategies are institutional supports that promote positive attitudes toward mathematics. These include teachers' professional development, access to counseling, and the establishment of a supportive school culture that emphasizes effort and improvement. Gjicali and Lipnevich (2021) highlighted that teacher beliefs and instructional practices are crucial in influencing students' attitudes. Teachers who exhibit enthusiasm, offer support, and establish a safe environment can have a powerful impact on students' emotional engagement.

The implications of the findings also extend to educational policy, specifically for the Philippines, as math performance continues to be an issue of national interest. Based on the OECD (2023), Filipino students posted below-proficiency scores in international exams, and thus there is a need for system-wide interventions. The study adds to the policy debate by showing that affective considerations need to be considered in attempts to enhance mathematics education. Curriculum policies that only address content delivery or assessment reform are likely to be inadequate unless they also touch upon the emotional and motivational aspects of learning.

In addition, the support of Expectancy Value Theory from the study offers a theoretical explanation for these issues and how to address them. Through the understanding that students' motivation is influenced by their belief in success and the value of the consequences, teachers and policymakers can develop interventions to strengthen expectancy and valence. These involve setting attainable goals, giving informative feedback, and making mathematics related to students' own interests and life prospects.

In summary, the findings of this study highlight the central role that attitudes play in mathematics teaching and learning. Students' views of mathematics—most notably their interest, confidence, anxiety, and perceived usefulness—are not mere background variables. They are active influences on student performance. The significant correlation between attitude and achievement points to the necessity of emotionally responsive instructional practices, supportive classroom environments, and policies for student well-being.

To advance mathematics achievement, teachers need to go beyond old habits and adopt methods that engage the whole learner. That means strengthening positive emotions, self-efficacy, and significant learning that speaks to students' experiences. In doing so, we enable students not only to achieve in mathematics but also to become confident and motivated to pursue STEM career opportunities and beyond.

**Conclusions**

The results of this research indicate a complex and multi-dimensional picture of students' mathematical attitudes and their related levels of achievement. Although students have a medium attitude towards mathematics overall, the results demonstrate an unambiguous imbalance between the components of the attitudinal process. Students have a high perception of the utility of mathematics, meaning that they intellectually realize its applicability in everyday life, professional future, and global society. This is consistent with the "valence" element of Victor Vroom's Expectancy Value Theory, which suggests that effort is more likely to be applied when the outcome is valued. Despite this mentally valued outcome, however, students exhibit low interest and confidence levels with a dominating presence of anxiety. These motivational and emotional deficiencies imply that the students might not feel qualified enough to approach mathematics in a meaningful manner, which could impede their learning and future achievement in the subject.

The academic performance data, which measured an average score of 84.13 classified as satisfactory, further complicate the situation. Even though the average score shows that students are achieving minimum competency levels, the large standard deviation of 7.23 indicates wide variation in accomplishment. This variation implies that although some students perform well, others struggle significantly, most probably because of the way they emotionally engage and believe in themselves. Students with stronger confidence and weaker anxiety tend to continue despite obstacles and function better, while those with negative orientations tend to disengage or even refrain from doing mathematics altogether. These results further support the overall thesis that affective aspects—interest, confidence, anxiety, and perceived usefulness—are not peripheral but core to mathematical academic success.

The research's confirmation of Victor Vroom's Expectancy Value Theory offers a strong theoretical framework through which to explain these findings. Under the theory, motivation is a product of expectancy (one's belief in being able to succeed), instrumentality (one's belief that one can achieve success and thereby attain desired outcomes), and valence (outcome value). In this research, students exhibit high valence but low expectancy, in that they like mathematics but do not feel that they can be successful at it. Such a lack of balance weakens motivation and emphasizes the necessity of instructional practices that boost students' confidence in their capability to succeed. If left unaddressed, attempts to enhance mathematics performance are unlikely to be successful, as students will remain mired in emotional challenges that get in the way of learning.

To increase performance and encourage more sustained academic success, there is a definite and urgent need to increase students' interest and confidence and alleviate math anxiety through supportive and interesting teaching approaches. Interest can be developed by making math more relevant and more enjoyable, incorporating real-world applications, interdisciplinary connections, and interactive learning experiences. Confidence can be developed through scaffolding instruction, formative feedback, and success opportunities that support students' belief in themselves. Anxiety can be reduced through emotional support structures, stress-reduction methods, and classroom environments that respect psychological safety and invite risk-taking.

**Recommendations**

Considering the evidence presented above, the following recommendations are made to enhance students' affective development and mathematics achievement.". Initially, schools shall implement integrated approaches that maintain students' favorable attitudes towards mathematics, as outlined by Sustainable Development Goal 4: Quality Education under the 2030 Agenda for Sustainable Development. This international framework focuses on inclusive and equitable quality education and promoting life-long learning opportunities for everyone. Through meeting students' emotional and motivational needs, schools can assist in this endeavor and help make mathematics education accessible, challenging, and empowering.

Teachers have a crucial role in influencing students' attitudes toward mathematics. Hence, it is suggested that teachers include interesting, real-world applications of mathematics in their teaching. This can assist in keeping the interest of the students intact and emphasizing the utility of the subject, filling the gap between abstract ideas and concrete experiences. For instance, mathematics teachers can utilize financial literacy, analysis of environmental data, or architectural design projects to show how mathematics is implemented in real life. These contextualized learning exercises can make the subject of mathematics more relevant and encourage students to put in effort to study the subject.

Confidence may be reinforced through regular feedback, peer learning, and tailored support. Teachers shall offer constructive feedback focusing on development and improvement as opposed to correctness per se. This can assist students with developing a growth mindset and perceiving errors as possibilities for learning. Peer learning activities, like collaborative problem-solving and peer tutoring, can also promote a community of learning and collective responsibility, mitigating the stigma of mathematical struggles. Personalized support, like differentiated instruction and one-on-one mentoring, can meet students' individual learning requirements and enhance students' self-efficacy.

To minimize anxiety, schools ought to implement emotional support mechanisms that assist students in coping with stress and learning to manage it. Such mechanisms can be through access to school counselors, mindfulness initiatives, and classroom protocols that foster emotional balance. Teachers can also design psychologically safe classrooms by inviting questions, acknowledging feelings, and praising effort. When the students feel supported and understood, they are better able to take academic risks and learn complex content.

In addition, teachers need training in affective instructional strategies that foster students' interest, confidence, and motivation. Professional development workshops shall incorporate modules on emotional intelligence, student-centered instruction, and trauma-informed teaching. These workshops can provide instructors with the skills necessary to identify and attend to students' affective needs, creating a more responsive and welcoming mathematics classroom. Training shall also highlight the significance of teacher attitudes since research indicates that teachers' beliefs and behaviors have a strong impact on student outcomes.

Maintenance of positive dispositions—interest, confidence, low anxiety, and perceived usefulness—shall be a systemic and concerted effort. School leaders are tasked with putting affective outcomes high on their strategic agendas, funding emotional support services, and establishing policies that are conducive to student well-being. Curriculum writers must construct materials that are motivating, culturally responsive, and connected to students' lived realities. Parents and guardians shall be engaged in the facilitation of mathematics learning at home, reinforcing positive attitudes and acknowledging academic effort.

In addition, assessment practices shall be aligned with affective objectives. Conventional high-stakes testing tends to heighten anxiety and discourage risk-taking, especially for students who already lack confidence. Rather, schools must embrace formative and performance-based assessments focused on process, creativity, and application. These types of assessments can yield more complete and accurate measures of student understanding and attitudes to inform instructional decisions and support strategies.

Research and innovation must also be fostered to investigate new strategies to enhance attitudes and performance in mathematics. Future research can evaluate the effect of technology-enhanced learning tools, like virtual manipulatives, adaptive learning systems, and game-like environments, on students' emotional involvement. Longitudinal investigations can explore how attitudes change over time and pinpoint significant periods for intervention. Action research by teachers can offer classroom-savvy insights into effective classroom strategies within contexts.

Lastly, equity and inclusion need to be at the forefront of any efforts to enhance mathematics education. Students from underrepresented groups can have extra obstacles to establishing positive attitudes towards mathematics, such as restricted access to resources, cultural bias, and structural inequities. Schools need to make sure that all students—regardless of origin—can see mathematics as a rich, powerful, and enjoyable subject. This entails targeted support, appreciation of diverse mathematical contributions, and the avoidance of stereotypes limiting the potential of students.

In summary, the results of this research pinpoint the significance of dealing with students' attitudes towards mathematics as one of the fundamental levers to enhance academic achievement. The value of mathematics is acknowledged by students, yet their low interest, confidence, and high anxiety pose considerable obstacles to participation and achievement. By implementing a student-centered and holistic instructional framework that incorporates affective teaching methods, emotional support systems, and inclusive practices, educators and policymakers can establish learning environments that nurture positive attitudes and support long-term success in mathematics. These measures are not only crucial to academic success but also to equipping students to navigate a data-dependent and complex world with confidence, curiosity, and resilience.

**References**

**Abalde, G., & Oco, R. (2023)**. Factors associated with mathematics performance. Asian Research Journal of

Mathematics, 19(6), 45–60. https://philarchive.org/rec/ABAFAW

**Aikenhead, G. S. (2020).** Researching attitudes towards mathematics education: Current perspectives and

practices. Canadian Journal of Science, Mathematics and Technology Education, 20(3), 356–372. [*https://doi.org/10.1007/s42330-020-00103-4*](https://doi.org/10.1007/s42330-020-00103-4)

**Bernardo, A. B. I., Visco, D. A., & Inocencio, A. (2022)**. Understanding the low performance of Filipino

students in international large-scale assessments: Insights from PISA 2018. Philippine Journal of Education, 101(1), 45–60.

**Cai, J., Wang, T., & Moyer, J. C. (2017).** A cross-cultural analysis of students’ attitudes toward mathematics:

Implications for teaching and learning. International Journal of Educational Research, 85, 15–27. [*https://doi.org/10.1016/j.ijer.2017.06.002*](https://doi.org/10.1016/j.ijer.2017.06.002)

**Capuno, R. G., Necesario, R. T., & Dela Peña, J. M. (2019).** Students’ attitudes and academic performance

in mathematics. International Journal of Scientific and Research Publications, 10(5), 211–218.

https://doi.org/10.29322/IJSRP.10.05.2020.p10125

**Cerbito, A. F. (2020).** Comparative analysis of mathematics proficiency and attitudes toward mathematics of

senior high school students. International Journal of Scientific and Research Publications, 10(5), 211–

218. https://files.eric.ed.gov/fulltext/ED605013.pdf

**Department of Education. (2020).** 2019 National Achievement Test results: Summary of findings. DepEd.

**Furinghetti, F., & Morselli, F. (2013).** Beliefs and attitudes toward mathematics in problem-solving. Educational Studies in Mathematics, 82(1), 123–138 https://doi.org/10.1007/s10649-012-9412-7

**Galabo, R. G., Abellanosa, R. D., & Gempes, G. P. (2018).** Mathematical readiness and performance of students in Cluster 6 Tugbok Secondary Schools in Davao City. International Journal of Advanced Research in Management and Social Sciences, 7(3), 1–15.

**Gjicali, K., & Lipnevich, A. A. (2021).** Mathematics attitudes and their unique contribution to academic achievement. Contemporary Educational Psychology, 66, 101990. https://doi.org/10.1016/j.cedpsych.2021.101990

**Hannula, M. S., Di Martino, P., Pantziara, M., & Morselli, F. (2016).** Emotions in mathematics education: A review of the literature. In G. Kaiser (Ed.), Proceedings of the 13th International Congress on Mathematical Education (pp. 107–135). Springer.

**Hwang, S., & Son, T. (2021).** Students’ attitude toward mathematics and its relationship with mathematics achievement. Journal of Education and e-Learning Research, 8(3), 272–280. <https://doi.org/10.20448/journal.509.2021.83.272.280>

**Lee, J., Lee, Y., & Bong, M. (2019).** Academic interest and self-regulation: How they influence learning and achievement. Educational Psychology, 39(4), 482–501. https://doi.org/10.1080/01443410.2018.1543854

**Lim, S. Y., & Chapman, E. (2015).** Development of a short form of the attitude toward mathematics inventory. Educational Studies in Mathematics, 89(2), 197–212. <https://doi.org/10.1007/s10649-015->9593/2

**Manoah, S. A., Indoshi, F. C., & Othuon, L. A. (2011).** Influence of attitude on the performance of students in the mathematics curriculum. Educational Research, 2(3), 965–981.

**Mazana, M. Y., Montero, C. S., & Casmir, R. O. (2023).** Exploring the impact of mathematics enjoyment and anxiety on academic outcomes. Journal of Education and Practice, 14(2), 55–63.

**Moussa, A., & Saali, M. (2022).** Students’ perceptions and attitudes toward mathematics and their impact on performance. International Journal of Educational Research Open, 3, 100123. https://doi.org/10.1016/j.ijedro.2022.100123

**Mohamed, L., & Waheed, H. (2011).** Secondary students’ attitudes towards mathematics in a selected school of the Maldives. International Journal of Humanities and Social Science, 1(15), 277–281.

**Moussa, A., & Saali, M. (2022).** Students’ perceptions and attitudes toward mathematics and their impact on performance. International Journal of Educational Research Open, 3, 100123. https://doi.org/10.1016/j.ijedro.2022.100123

**OECD. (2023).** PISA 2022 results: The state of learning and equity in education. Organisation for Economic Co- Co-operation and Development.

**Olatoye, R. A., & Ogunkola, B. J. (2021).** Student attitude and performance in mathematics: Implications for

school improvement. Journal of Educational Research and Practice, 11(2), 103–114.

[*https://doi.org/10.5590/JERAP.2021.11.2.08*](https://doi.org/10.5590/JERAP.2021.11.2.08)

**Potential Unearthed. (n.d.).** Vroom’s Expectancy of Needs Theory.Retrieved from

<https://www.potentialunearthed.co.uk/wp-content/uploads/2017/11/Vrooms-Expectancy-of-Needs-> theory.pdf

**Reyes, M. P., & Castillo, A. B. (2023).** Students’ attitudes and mathematics performance during the new normal in Davao Region. Journal of Educational Studies, 12(4), 89–102.

**Rogers, B., & Van Horne, S. (2019).** Predicting academic success through attitude and self-efficacy in

mathematics. Journal of Educational Psychology, 111(4), 799–813.

[*https://doi.org/10.1037/edu0000305*](https://doi.org/10.1037/edu0000305)

**Schukajlow, S., Rakoczy, K., & Pekrun, R. (2017).** Emotions and motivation in mathematics education:

Theoretical considerations and empirical evidence. ZDM Mathematics Education, 49, 307–322.

<https://doi.org/10.1007/s11858-017-0851-8>

**Steinmayr, R., Weidinger, A. F., Schwinger, M., & Spinath, B. (2019).** The importance of motivation as a

predictor of school achievement. Learning and Instruction, 60, 82–95. https://doi.org/10.1016/j.learninstruc.2018.05.006

**Studer, B., & Knecht, S. (2016).** Motivation and expectancy value theories in cognitive neuroscience. Neuroscience of Motivation, 45–67.

**Ubat, J. M., & Gempes, G. P. (2024).** Interest and performance in mathematics among junior high school students in Mindanao. Philippine Journal of Educational Measurement, 15(1), 33–47.

**Vroom, V. H. (1964)**. Work and motivation. Wiley.

**Yilmaz, H., & Yenilmez, K. (**2020). Exploring the relationship between high school students' attitudes and mathematics achievement. Eurasia Journal of Mathematics, Science and Technology Education, 16(3), em1837. *https://doi.org/10.29333/ejmste/115080*