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INFLUENCE OF PARENTAL INVOLVEMENT AND STUDENTS' ATTITUDE TO MATHEMATICS SELF-EFFICACY

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ABSTRACT

Nearly 19 million Filipino graduates (2019–2024) are not functionally literate, per PSA. PISA 2022 also ranked Philippines near the bottom in math. Despite the end of COVID-19 pandemic six years ago, its impact continues to affect students particularly their self-efficacy and performance in Mathematics compared to pre-pandemic years. Research revealed that high mathematics self-efficacy encourages the achievement of good learning outcomes, and when students have good learning outcomes, they will be more motivated in the learning process. Unlike other studies, this one focused on students who had only modular learning throughout pandemic. This study aimed to explore how parental involvement and students' attitudes influence math self-efficacy, identifying which specific factors have the most impact. Data from 332 students were gathered using adapted questionnaires and analyzed through mean, Pearson r, and multiple linear regression. The results showed a statistically significant regression model, with a strong correlation between parental involvement, student attitude, and math self-efficacy. Among the domains of parental involvement, mathematics learning counselor, motivator, and resource provider are predictors, however their influence on Mathematics Self-Efficacy is minimal. On the domains of students' attitude, confidence, value, and motivation predict Mathematics Self – Efficacy. Motivation has noticeable effects while others have only minimal influence. The findings suggest that parents may support their children's math self-efficacy by identifying their learning needs and providing appropriate resources. Teachers may use engaging strategies for Students to enjoy math and become more confident and motivated while school administrators can support by supplying materials suited to students' skill level.

KEYWORDS: *Education, Mathematics, Parental Involvement, Students' Attitude, Mathematics Self-efficacy*

INTRODUCTION

Rationale

Data from the Philippine Statistics Authority showed that 18.96 million students who graduated between 2019 - 2024 are not 'functionally literate,' defined by the agency as the ability to read, write, compute, and comprehend. PISA 2022 result also showed that in mathematics the Philippines ranked sixth to the last. This shows that although the COVID-19 Pandemic ended 6 years ago, many students are still affected by its aftermath. Research has validated that the pandemic has negatively impacted students' capacity to perform affecting their self-efficacy in Mathematics compared with the previous years before pandemic. Students who had to abruptly and involuntarily transit to modular learning were not well equipped to function successfully in their new learning environment. The need to adapt to an unanticipated – and perhaps undesired – way of learning has impacted their self - efficacy because of a lack of confidence in, certainty about or acceptance of modular learning (Abdolrezapour et al., 2023; Casinillo, 2022; OECD - PISA 2022 Results; PSA *SSR 2024-08*; Talsma et al., 2021).

Henceforth, this problem needs to be investigated and remedied for high mathematics self-efficacy will improve the achievement of good learning outcomes, resulting to motivation in the learning process as numerous studies found out that higher self-efficacy expectations can lead to better results and increase the motivation for learning mathematics (May, 2009; Zimmermann et al., 2011 as cited by Masitoh & Fitriyani, 2018).

Significantly, parental involvement has emerged as one of today's most important topics in educational circles because of psychological studies. As the pandemic closed all face-to-face classes, parental involvement in a student's education was highlighted as an important contributor to students' mathematics self-efficacy and in academic success. On the other hand, the study of attitudes toward mathematics has given special attention due to its crucial role in the learning of mathematics and perennially, negative attitudes toward the subject are common. Studies found out that student's thoughts reflected in their attitudes toward mathematics will lead to a specific outcome because of their actions. Having a positive attitude means that whatever happens, there is something good that can be expected from it if efforts were exerted (Blackweir, 2016; Emerson, Fear, Fox, & Sanders, 2012; Hill, & Tyson, 2009; McNaught, 2010; Varghese P I, K.B. Jasmine Suthanthira Devi, 2019; Wilder, 2014 as cited by Tenenbaum, 2018).

Moreover, this study is anchored on Self - Efficacy theory of Albert Bandura (1977). This is a representative of an individual's belief in their ability to complete a given task successfully and affects and is influenced by behaviors and social/environmental variables. The SE beliefs and learners' attitude towards Mathematics are essential to the achievement of motivation, which facilitates the learner's self-regulation as well as an academic accomplishment. From a social cognitive perspective, parents play a significant role as they can help

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change child's attitude to develop self-efficacy (Dibenedetto, 2020).

In addition, parental involvement played an important role in students' mathematics self-efficacy. It was revealed in a study that parental involvement had a significant impact on students' self-efficacy. Collectively, self-efficacy in mathematics is strongly related to the students' attitudes towards the subject. It appears to be a more important factor influencing attitudes. Supported by Hoffman and Schraw (2009), they said that students with higher math self-efficacy have a strong attitude to persist longer on difficult math problems and are more accurate in math computations than those lower in mathematics self-efficacy (Friedel et al., 2010; Shaunnie Farr, 2015).

Moreover, upon the resumption of face-to-face classes for the school year 2022 – 2023, the researcher observed that those students that have confidence in doing mathematics can easily understand and connect what they have learned from their previous school years. They are also the students whose parents are actively engaging in school activities supporting their children and communicating teachers on how their students are doing in school. On the other hand, another student of the researcher was suddenly remarkably improved in mathematics. From being quiet and getting low scores in Mathematics, he became confident and studying the subject very well. He became participative and getting higher scores from quizzes and even got the highest score in their 2nd quarter exam. From these observations, the researcher would like to examine on how parental involvement and students' attitudes influence students' mathematics self-efficacy as the theory stated that self – efficacy affects and is influenced by behaviors and social/environmental variables.

Shown in figure 1, the study has two independent variables namely Parental Involvement and Students' Attitude towards Mathematics, and the dependent variable is Mathematics' Self-Efficacy.

Parental Involvement is defined as parents assisting their child at home in informal and in school-directed mathematics-related activities. These roles which also serve as the indicators of this study can include parents as motivators, monitors, resource providers, mathematics content advisers, and mathematics learning counsellors (Cai, 2003 cited by Bartolome, et.al, 2017).

Motivator implies how parents motivate and encourage their child to study mathematics. Monitor is a role of a parent on how they check the progress of their child in learning mathematics. Another role is resource provider which implies how parents provide the needs of their children in learning mathematics. Parents as Mathematics content advisor is a role where they help their children on understanding and solving math problems and helping them in doing their homework. Lastly, parents as mathematics learning counselor implies their understanding and strategies in helping their child in different math topics. Moreover, Kunmar (2020) mentioned four factors related to attitudes towards mathematics including self-confidence, value, enjoyment, and motivation. Self-confidence refers the belief of the students on how well they do in mathematics. Value refers to how the students see the importance of

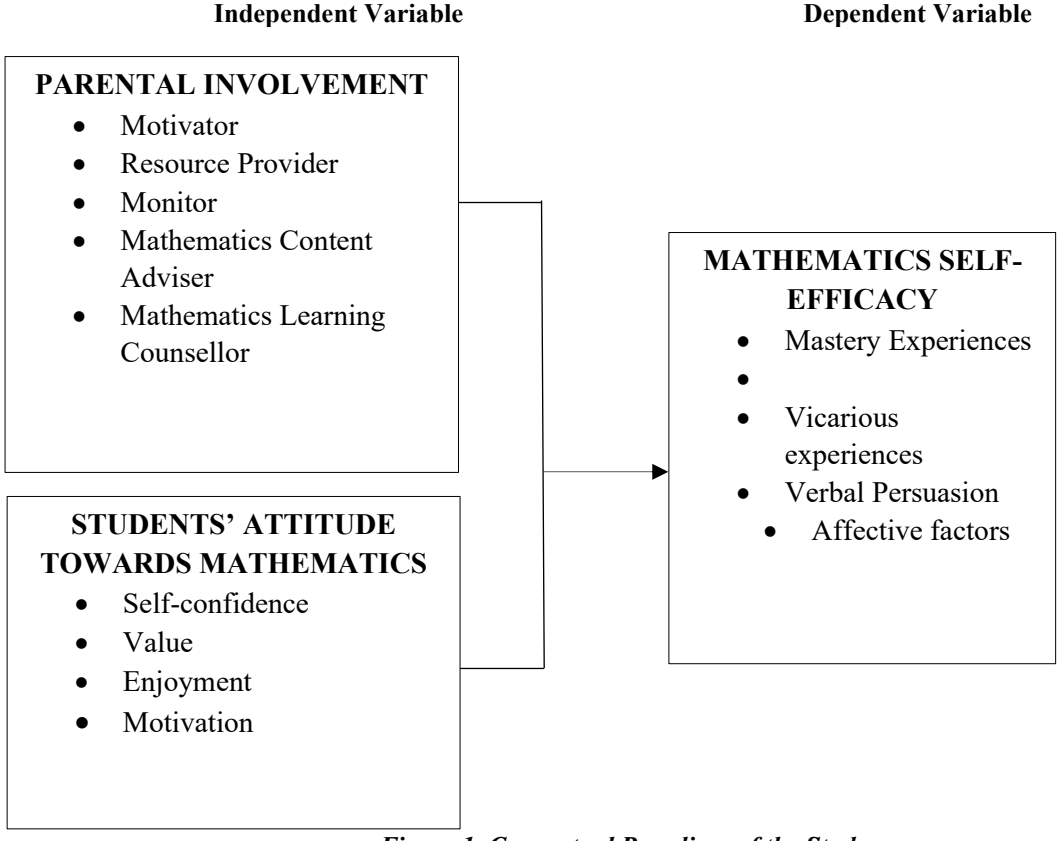


Figure 1. Conceptual Paradigm of the Study

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mathematics Enjoyment refers to how happy or how students love mathematics. Lastly, motivation refers to how motivated the students are in learning mathematics.

In addition, Bandura (1994) constructed four sources of self-efficacy which are indicators of Mathematics self-efficacy, namely: mastery experiences, vicarious experiences, verbal persuasion, and affective factors. Mastery experiences refer to students' progress, success, and how well they do mathematics. Vicarious experiences refer to students' motivation when seeing someone good in math. Verbal persuasion is students' motivation when someone appreciates their skill or progress in learning and in doing mathematics, Affective factor refers to how the students see mathematics.

Much research had been conducted like this study, but this is different because the respondents of this study experienced the modular learning for two years with no face-to-face contact with the teachers. Students were having a hard time coping with the new normal, especially in learning Mathematics. From the result of students' assessments, the struggle of students in learning mathematics is eminently shown. On the other side, the researcher has not come across a study investigating the influence of parental involvement and students' attitude to mathematics self-efficacy and there was no prior research on this topic has been conducted in Maragusan. Based on the scenarios mentioned above, the researcher desired to conduct a study exploring the said variables, hence the urgency to conduct the study.

The main thrust of this study was to determine the influence of parental involvement and students' attitude to mathematics self-efficacy. Thus, it sought to know the level of parental involvement in terms of Motivator, Resource Provider, Monitor, Mathematics Content Adviser, and Mathematics Learning Counsellor, the level of students' attitude towards mathematics in terms of Self-confidence, Value, Enjoyment, and Motivation, and the level of students' mathematics self-efficacy in terms of Mastery Experiences, Vicarious experiences, Verbal Persuasion, and Affective factors. This study also determined the significance of the relationship of the independent variables to the dependent variable. Additionally, this study will determine what domains of Parental Involvement and Students' Attitude that will significantly influence Mathematics Self – Efficacy.

Mostly, advantages of this will assist the following: School administrators, teachers, students, and parents. This will aid the School Administrators in academic area particularly in mathematics in promoting overall students' performance in this mathematics. The teachers could also grasp effective and efficient new strategies and tactics in teaching mathematics.

Furthermore, this will help parents on how to monitor children's capability to solve and conceptualize ideas for them to be guided according to their lesson's resources. It also helps on how to identify students' need for references and reading materials at home. Likewise, this will assist students' confidence in solving mathematics. Also, future researchers could use the data as part of their related literature.

METHOD

Research Respondent

The researcher carefully considered the respondents of the study. The respondents of the study were the students from the selected schools belonged to Maragusan East District; School A with 634 total population of students, School B with 759 students and School C with 549 total number of students. The total population was 1,942 students. The said schools are under the Department of Education in the Division of Davao De Oro.

Moreover, to determine the number of samples required, the researcher used the Slovin's formula as it calculates the number of samples required when the population is too large to directly sample every member. As a result, there were 332 students who became the respondents of the study. Also, simple random sampling was utilized as these fits for Slovin's Formula and to lessen the biases that may occur (Tejada & Punzalan, 2012).

In addition, only the students from schools mentioned above were the respondents. Students who do not belong from the selected schools did not take part of this study.

This study was conducted in secondary schools located in Maragusan. It is one of the municipalities of the province of Davao De Oro and widely know as the summer capital of Davao Region. Maragusan is surrounded by mountains and some of its barangays and schools are in high areas. This was the reason why the researcher chose only the three said schools for the safety of the researcher.

Materials and Instrument

The instrument that was used in this study was the sets of questionnaires with a 5-point Likert scale survey that were carefully studied and developed by different researchers. All questionnaires were validated by expert validators. A pilot test with 50 participants was also conducted to assess the reliability of the questionnaire.

For parental involvement, the Parental Involvement Questionnaire (PIQ) developed by Cai, Moyer, and Wang (1996) was utilized to assess parental involvement in students' learning of mathematics. As a result of the pilot test, the PIQ demonstrated good reliability and validity for assessing parental involvement in students' learning of mathematics, as indicated by a Cronbach's alpha coefficient of 0.82 which indicates that the questionnaire has good internal consistency reliability. It suggests that the items in the questionnaire are consistently measuring the same underlying construct.

The scaling and parameters for Parental Involvement will be adopted as follows:

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Range of Means	Descriptive Equivalent	Interpretation
4.20 – 5.00	Very High	This indicates that the Parental Involvement is very much evident.
3.40 – 4.19	High	This indicates that the Parental Involvement is highly evident.
2.60 – 3.39	Moderate	This indicates that the Parental Involvement is moderately evident.
1.80 – 2.59	Low	This indicates that the Parental Involvement is rarely evident.
1.00 – 1.79	Very Low	This indicates that the Parental Involvement is not evident.

Moreover, for students' attitude towards mathematics, Attitudes Toward Mathematics Inventory developed by Tapia and Marsh (2004) was utilized. It was a reliable instrument that has a coefficient alpha of 0.93 which is an excellent internal consistency. This means the items are highly correlated and likely measure the same construct very reliably.

The scaling and parameters for Students' Attitude will be adopted as follows:

Range of Means	Descriptive Equivalent	Interpretation
4.20 – 5.00	Very High	This indicates that the Students' Attitude is very much felt.
3.40 – 4.19	High	This indicates that the Students' Attitude is highly felt
2.60 – 3.39	Moderate	This indicates that the Students' Attitude is moderately felt.
1.80 – 2.59	Low	This indicates that the Students' Attitude is rarely felt.
1.00 – 1.79	Very Low	This indicates that the Students' Attitude is not felt.

In addition, the researcher based and adapted the Middle School Mathematics Self-Efficacy Scale of Usher and Pajares (2009) as an instrument for the dependent variable, Mathematics Self – Efficacy. The 24-item scale developed not only reflects the four sources hypothesized by Bandura but also displayed internal consistency reliability as it displayed Cronbach's alpha of 0.896 above the cutoff of .80 recommended by Henson (2001).

The scaling and parameters for Mathematics Self-Efficacy will be adopted as follows:

Range of Means	Descriptive Equivalent	Interpretation
4.20 – 5.00	Very High	This indicates that the Mathematics Self-Efficacy is very much felt.
3.40 – 4.19	High	This indicates that the Mathematics Self-Efficacy is highly felt.
2.60 – 3.39	Moderate	This indicates that the Mathematics Self-Efficacy is moderately felt
1.80 – 2.59	Low	This indicates that the Mathematics Self-Efficacy is rarely felt.
1.00 – 1.79	Very Low	This indicates that the Mathematics Self-Efficacy is not felt.

Design and Procedure

This study is a quantitative non-experimental research design using correlational techniques. This method is used when the objective is to describe the status of the situation as it existed at the time of the study to explore the causes of a particular phenomenon. In correlation research, it involved collecting data to determine whether the degree of a relationship exists between two of more quantifiable variables (Travers, 2006 as cited by Marzini, 2013).

This descriptive survey dealt with quantitative data about the said phenomenon. The quantitative aspect was an appropriate schedule for gathering the data designed for the target respondents to answer the questions. The process of gathering the data was based using questionnaires. The focus of the study was to determine the influence of parental involvement and students' attitude to mathematics self-efficacy.

Upon the approval of the panel members, the researcher undergone the subsequent steps and procedures in gathering the data for the study ensuring the confidentiality of the participants in the implementation of this study. The researcher then went to the statistician for the pilot test to ensure the reliability of the questionnaires. Then the researcher sent a letter of permission to the office of the Division of Davao de Oro Superintendent to conduct the study. Upon approval, the researcher carried the approval letter of the office of the Schools Division Superintendent to conduct the study to the selected schools. The researcher then went to the principals or respective heads of the selected schools who facilitates meetings for the appropriate research participants to implement the study and gather data.

Moreover, when the selected schools conducted a General Parent – Teacher Association meeting, the researcher attended the meeting and explained to students and parents the purpose of the study and personally handed the parents' consent and explained its purpose. The researcher ensured that the participants know and understand the purpose of the study and highlighted to them that they may opt to decline if they are unwilling to participate. The participants were also assured that either they participate or not, they will not be harmed or face any unfavorable consequences. The researcher then explained to the respondents the level of risks in participating in this study. The researcher also informed the parents of the respondents for their protection from potential harms such as but not limited to physical, psychological damages, social harms, economic harms, criminal and civil liability for adverse event management. Also, voluntary participation and complete anonymity were guaranteed to all participants. The researcher considered the privacy of the participants with utmost priority.

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The researcher was committed to ensuring that any personal information or data provided by the participants was kept confidential and secure, and that their privacy was respected throughout the research process. Complete anonymity was guaranteed to all participants.

Prior to commencing data collection, the researcher thoroughly explained the research to the participants, and the aspects of their roles to help them understand it and its risks. Their participation was also completely voluntary. The participants in the study voluntarily confirmed their willingness to participate after knowing all the aspects that are relevant to their role as a participant. It was all documented by means of written, signed, and dated informed consent form. The informed consent form was written in a language that participants easily understand. It minimized the possibility of coercion or undue influence, and the participants was given sufficient time to consider participation.

Finally, the researcher tallied and handed it to a professional statistician to tabulate all the data that was gathered from the respondents, subject to statistical analysis. The statistical results were then analyzed and interpreted with objectivity with the guidance of the researcher's adviser to ensure true, correct, and accurate result and interpretation. With these, conclusions were drawn, and recommendations were formulated based on the findings of the study. The following statistical tools were utilized in this research work.

Mean. This will be used to give a concise description in the levels of parental involvement, students' attitude, and mathematics self-efficacy.

Pearson – r. This will be employed to determine the relationship of the independent variables; parental involvement, and students' attitude and the dependent variable; mathematics self-efficacy.

Multiple Linear Regression. This was used to explain the relationship between one continuous dependent variable from three independent variables.

Importantly, this study underwent thorough validation, review, and approval by the UMERC prior to its commencement. Ethical principles were strictly observed, including voluntary participation, privacy and confidentiality, informed consent, appropriateness of identified recruiting parties, assessment of potential risks and corresponding mitigation measures, and recognition of benefits. The absence of conflicts of interest was ensured, and organizational or locational permissions were duly secured.

The researcher demonstrated respect for intellectual property by properly citing all relevant authors and sources. To safeguard originality, the manuscript was subjected to plagiarism detection tools such as Grammarly and Turnitin, ensuring that no misinterpretation or misappropriation of others' work occurred. Honesty, integrity, and credibility were upheld throughout the process, with no evidence of intentional misrepresentation, exaggeration, or distortion to fit theoretical expectations.

Finally, the researcher, as the principal author, ensured appropriate attribution of authorship. Credit was granted to individuals who made substantial contributions to the conception and design, data acquisition, analysis and interpretation, drafting or critical revision of the manuscript, and final approval of the version to be published.

RESULT AND DISCUSSION

The findings and answers to the objectives posted in the study were presented, analyzed, interpreted and discussed in this chapter under the following headings: level of Parental Involvement, students' attitude, and mathematics self-efficacy and its relationship to the two independent variables.

Level of Parental Involvement

The level of Parental Involvement in terms of Motivator, Resource Provider, Monitor, Mathematics Content Advisor, and Mathematics Learning Counselor is shown in table 1. The result shows that the five indicators of Parental Involvement got an overall mean score of 3.36 and a standard deviation of 0.54 with descriptive equivalent Moderate. Among the indicators, Motivator has the highest mean of 3.61 with 0.63 standard deviation and described as High. On the other hand, Monitor got the lowest mean of 3.1 and a standard deviation of 0.79 with a descriptive equivalent of moderate.

Table 1.
Level of Parental Involvement

Indicators	Mean	*SD*	*Descriptive Equivalent*
Motivator	3.61	0.63	High
Resource Provider	3.26	0.69	Moderate
Monitor	3.1	0.79	Moderate
Mathematics Content Advisor	3.46	0.79	High
Mathematics Learning Counselor	3.36	0.71	Moderate
Overall	**3.36**	**0.51**	Moderate

This result indicates that the parental involvement is moderately evident which denotes that parent in their children's mathematics studies is present but not very strong. Parents as motivator is highly evident which means that they are able and know how to motivate their children to learn math and encourage them to work hard on math problems even though the problems are difficult. However, their role as monitor is moderately evident. Checking their child's homework, spending time to talk about math problems, requiring showing the results on math assignments, and monitoring the amount of time their children spent on math is not consistently done. While parents do participate in their children's math education,

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their involvement is not consistently high. Also, the standard deviation of 0.54 suggests that responses do not vary widely, meaning most parents exhibit similar levels of involvement.

This result supports Epstein's Framework of Involvement (1995) on learning at home, and parenting categories. The moderate level of involvement found supports Epstein's idea that not all parents engage equally across all domains, and some dimensions, like motivation, are naturally more accessible to parents than others like direct content support. Motivation has also been found by Ramanlingan and Maniam (2020) on their study titled Teachers' Perspective on the Importance of Parents' Roles in Students' Academic Achievement using Epstein's School and Family Partnership Model that to be the most important factor in determining students' academic achievement. As such, parents need to encourage, listen to, respond to, praise, guide, monitor, and discuss with their children about their studies.

Level of Students' Attitude

Presented in table 2 is the level of Students' Attitude. The result shows that among the four indicators, Value got the highest mean score of 3.88 with a standard deviation of 0.77 which is described as high. Motivation has the lowest mean with 3.22 and a standard deviation of 0.79 with a descriptive equivalent of moderate. The overall mean and standard deviation of Students' Attitude is 3.44 and 0.62 respectively with a descriptive equivalent of high.

Table 2.
Level of Students' Attitude

Indicators	Mean	*SD*	*Descriptive Equivalent*
Confidence	3.35	0.73	Moderate
Enjoyment	3.31	0.77	Moderate
Value	3.88	0.77	High
Motivation	3.22	0.80	Moderate
Overall	**3.47**	**0.65**	High

The result shows that even though the respondents value mathematics, they motivation to do math is not consistently high. Albeit students believe that Math is important in everyday life, a necessary subject, and believe that knowing math will make them earn a living, they erratically find math as enjoyable subject and enjoy the challenges of math. Not all the time they are comfortable expressing their own ideas on how to look for solutions to a difficult problem.

This result supports Self – Determination Theory of Edward L. Deci and Richard M. Ryan which stated that "True motivation flourishes when people feel autonomous, competent, and connected." The finding of moderate motivation despite high value may indicate that students don't feel competent or autonomous enough in math learning to be intrinsically motivated. Value without supportive learning environments does not guarantee high motivation (Ryan & Deci, 2000; Ryan & Deci, 2017).

Moreover, empirical studies also found that students choose math courses largely based on perceived value and utility, even when motivation or enjoyment is lower (Kirkham et al., 2023). Pizon and Ytoc (2021) also stated on their study that Mathematics performance is not driven by a single factor, but by a dynamic interplay of motivation, attitude, learning style, and teaching strategies—each shaping the learner's path to success. However, Sing et al., (2016) found that value and motivation are highly correlated, implying that students who value math should also be highly motivated.

Level of Mathematics Self - Efficacy

Table 3 presents the level of Mathematics Self-Efficacy, which has an overall mean of 3.28 and a standard deviation of 0.61, corresponding to a descriptive equivalent of moderate. Among the indicators, Verbal Persuasion recorded the highest mean of 3.44 with a standard deviation of 0.68, categorized as high. In contrast, the Affective Factor had the lowest mean of 3.15 and a standard deviation of 0.82, with a descriptive equivalent of 'moderate.

Table 3.
Level of Mathematics Self-Efficacy

Indicators	Mean	*SD*	*Descriptive Equivalent*
Mastery Experiences	3.19	0.73	Moderate
Vicarious Experiences	3.36	0.70	Moderate
Verbal Persuasion	3.44	0.69	High
Affective Factor	3.15	0.82	Moderate
Overall	**3.29**	**0.54**	Moderate

This suggests that, on average, students have a fair level of confidence in their mathematical abilities, but there is room for improvement. Among the different factors influencing self-efficacy, Verbal Persuasion had the highest mean (M = 3.44, SD = 0.68), which falls into the high category. This indicates that encouragement from teachers, peers, or other influential figures plays a significant role in boosting students' confidence in mathematics.

On the other hand, the Affective Factor had the lowest mean (M = 3.15, SD = 0.82), categorized as moderate. This suggests that students' emotions, such as anxiety or stress related to math, may negatively impact their confidence. They feel stressed and

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erratically get excited and energized as soon as they begin their math work. The higher standard deviation (0.82) also indicates greater variation among students in this area, meaning some struggle significantly more with emotional factors than others.

The result supports Albert Bandura's Self – Efficacy Theory (1977) . The study's finding that Verbal Persuasion had the highest mean confirms that encouragement from others (teachers, peers, mentors) significantly boosts students' confidence in their abilities. The Affective Factor having the lowest mean also aligns with Bandura's view that negative emotional states can undermine self-efficacy (Bandura, 1986). Moreover, Recent studies support that verbal persuasion is a strong positive influence, while affective factors (like anxiety) can hinder self-efficacy. It is also emphasized that math self-efficacy is multidimensional, influenced by both internal (motivation, emotion) and external (teaching, feedback) factors which confirms the importance of affective and social factors in shaping students' confidence in math (Sørlie Street et al.,2024; Zakariya, 2022).

Significance on the Relationship between Parental Involvement and Mathematics Self-Efficacy

Presented in Table 4 is Relationship between Parental Involvement and Mathematics Self-Efficacy. The correlation coefficient between Parental Involvement and Mathematics Self-Efficacy is 0.459. This indicates a moderate positive correlation, meaning that as parental involvement increases, students' self-efficacy in mathematics also tends to increase. Thus, rejecting the hypothesis.

The result shows that when parental involvement increases, students' mathematics self – efficacy also increases. Parents should be more involved in their children's study in mathematics that their belief in their capacity to do better in mathematics will increase. This result supports that parents play a powerful role in shaping their children's learning journey. Guided by Vygotsky's sociocultural theory emphasis of the "more knowledgeable other," they help children grow beyond what they can do alone – especially in early math. But many parents

Table 4.
Relationship between Parental Involvement and Mathematics Self-Efficacy

Indicators	Dependent Variable	r-value	p-value	Decision
Motivator	Mathematics Self - Efficacy	0.372*	<0.001	Reject H_o
Resource Provider		0.352*	<0.001	Reject H_o
Monitor		0.351*	<0.001	Reject H_o
Mathematics Content Adviser		0.241*	<0.001	Reject H_o
Mathematics Learning Counselor		0.417*	<0.001	Reject H_o

*p<0.05
Overall r-value = 0.459
Overall p-value <0.001

feel unsure of how to support this growth.Mowder's parents' development theory reminds us that parenting itself is a learning process, shaped by one's own life experiences and education. Bronfenbrenner adds another layer, showing how a child's development is influenced not just by family, but by the broader environment—school, community, and society (Bronfenbrenner, 1992; Mowder, 2005; Vygotsky, 1986).

Empirical studies also showed that when parents believe in their children's abilities and stay involved in their education, children become more confident and motivated. They believe they can succeed—and often do. It was also found that parental involvement has a meaningful impact on students' academic achievement and significantly predicted students' self-efficacy in a study of Nigerian secondary school students. These findings reinforce just how vital a parent's role truly is (Betts, 2021; Betts & Son, 2022 cited by Lamberg & Moss, 2023).

Significance on the Relationship between Students' Attitude and Mathematics Self-Efficacy

Table 5 showed the correlation coefficient of 0.791 which indicates a strong, positive, and statistically significant ($p < 0.01$) relationship between students' attitude towards mathematics and their mathematics self-efficacy. This means that students with more positive attitudes tend to have higher self-belief in their mathematical abilities. Thus, rejecting the hypothesis.

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Table 5.
Relationship between Students' Attitude and Mathematics Self-Efficacy

Indicators	Dependent Variable	r-value	p-value	Decision
Confidence	Mathematics Self - Efficacy	0.692*	<0.001	Reject H_o
Enjoyment		0.695*	<0.001	Reject H_o
Value		0.441*	<0.001	Reject H_o
Motivation		0.751*	<0.001	Reject H_o

*p<0.05
Overall r-value = 0.791
Overall p-value <0.001

This means that as students' attitudes toward mathematics improve, their mathematics self-efficacy also tends to increase. This suggests that fostering positive attitudes toward math—such as making it more engaging, relevant, and less intimidating—could significantly boost students' confidence in their math abilities. Students who feel good about math often believe they can succeed in it. When students enjoy math and see its value, they become more confident in their ability to do it well.

This finding supports Bandura's Social Cognitive Theory (1986), which explains that self-efficacy is shaped by personal experiences, emotional states, and social influences. A positive attitude toward math helps students feel more capable, which boosts their confidence and willingness to engage with the subject. It also aligns with Vygotsky's Sociocultural Theory, which emphasizes the importance of social and emotional support in learning, and Bronfenbrenner's Ecological Systems Theory, which highlights how a student's environment; home, school, and society shape their development. Empirical studies from the past decade confirm this connection. One of these is the study of Hwang and Son (2021) of which they found out that students who liked and valued math had higher confidence and achievement. Similarly, Yang, Maeda, and Gentry (2024) showed that math self-efficacy is closely tied to students' attitudes and is a strong predictor of academic success. A positive attitude toward math builds confidence—and that confidence leads to success.

Regression Analysis on the Influence of Parental Involvement and Students' Attitude to Mathematics Self-Efficacy

Table 6 presents the result of the Regression Analysis on the Influence of Parental Involvement and Students' Attitude to Mathematics Self-Efficacy. It showed that the overall regression model is statistically significant as it obtained an F – value of 293.804 with a p-value of <0.001. The obtained valued 0.798 of R indicates a strong correlation between the predictors and the dependent variable. With an adjusted R^2 0.635, suggests that approximately 63.5% of the variance Mathematics Self – Efficacy is explained by the model. which indicates a strong correlation between the predictors and the dependent variable. Students' Attitude has a strong positive influence on Mathematics Self-Efficacy (β = 0.736), and is highly significant, and Parental Involvement also has a positive and significant effect (β = 0.120), though its impact is smaller compared to Students' Attitude.

Table 6.
Regression Analysis on the Influence of Parental Involvement and Students' Attitude to Mathematics Self-Efficacy

Independent Variables	Unstandardized Coefficients		Standardized Coefficients Beta	t – value	p – value	Decision
	B	***SE***				
(Constant)	0.333	0.141				
Parental Involvement	0.135	0.042	0.120*	3.219	0.001	Reject H_o
Students' Attitude	0.721	0.036	0.736*	19.830	<0.001	Reject H_o
Dependent Variable: Mathematics Self – Efficacy						

*p<0.05
R = 0.798
Adjusted R^2= 0.635
F – value = 293.804
p – value <0.001

These findings are supported by Bandura's Social Cognitive Theory (1986), which posits that self-efficacy beliefs are shaped by personal experiences, attitudes, and social influences. Students who hold positive attitudes toward mathematics are more likely to believe in their ability to succeed, thereby enhancing their self-efficacy. This aligns with the strong beta coefficient observed for Students' Attitude.

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Furthermore, Eccles' Expectancy-Value Theory (1983) provides a complementary explanation. According to this theory, students' motivation and performance are influenced by their expectations of success and the value they assign to the subject. A positive attitude toward mathematics reflects both high expectancy and high value, which in turn fosters stronger self-efficacy.

The role of Parental Involvement, though less pronounced, is still significant. This is consistent with Bronfenbrenner's Ecological Systems Theory (1979), which emphasizes the influence of the microsystem—particularly family—on a child's development. Parental support, encouragement, and engagement in academic activities contribute to the development of students' confidence and belief in their mathematical abilities. Additionally, Vygotsky's Sociocultural Theory (1978) supports the notion that learning is a socially mediated process. Parental involvement can serve as a scaffold, helping students navigate challenges and build competence in mathematics, thereby enhancing self-efficacy. Lastly, Attribution Theory (Weiner, 1985) suggests that students with positive attitudes are more likely to attribute success to internal factors such as effort and ability. These adaptive attributions reinforce their belief in their capacity to succeed in mathematics, further strengthening self-efficacy. The findings are well-grounded in established psychological and educational theories, highlighting the critical roles of both internal attitudes and external support systems in shaping students' mathematics self-efficacy.

Regression Analysis on the Influence of the Domains of Parental Involvement to Mathematics Self-Efficacy

Table 6.1 presents the results of a regression analysis examining how five domains of parental involvement—Motivator, Resource Provider, Monitor, Mathematics Content Adviser, and Mathematics Learning Counselor—influence students' mathematics self-efficacy. Each domain is represented by its unstandardized coefficient (B), standard error (SE B), and standardized coefficient (Beta), which allows for comparison of their relative impact. The model has an R^2 value of 0.254, indicating that 25.4% of the variance in mathematics self-efficacy is explained by these predictors. The F-statistic of 22.491 suggests that the overall model is statistically significant.

Table 6.1

Regression Analysis on the Influence of the Domains of Parental Involvement to Mathematics Self-Efficacy

Independent Variables	Unstandardized Coefficients		Standardized Coefficients Beta	t – value	p – value	Decision
	B	*SE*				
(Constant)	1.362	0.200				
Motivator	0.183	0.053	0.188*	3.448	<0.001	Reject H_o
Resource Provider	0.144	0.051	0.162*	2.846	0.005	Reject H_o
Monitor	0.078	0.048	0.101	1.629	0.104	Do not Reject H_o
Mathematics Content Adviser	-0.063	0.047	-0.082	-1.329	0.185	Do not Reject H_o
Mathematics Learning Counselor	0.229	0.055	0.266*	4.179	<0.001	Reject H_o
Dependent Variable: Mathematics Self – Efficacy						

*p<0.05
R = 0.504
Adjusted R^2= 0.242
F – value = 22.491
p – value <0.001

The Mathematics Learning Counselor role had the strongest positive influence on mathematics self-efficacy (Beta = 0.266), followed by Motivator (Beta = 0.188) and Resource Provider (Beta = 0.162). The Monitor role had a smaller positive effect (Beta = 0.101), while the Mathematics Content Adviser role showed a slight negative influence (Beta = -0.082).

The regression analysis revealed that different forms of parental involvement influence students' mathematics self-efficacy in distinct ways. The role of the Mathematics Learning Counselor had the strongest positive effect, followed by Motivator and Resource Provider, suggesting that when parents offer emotional support, encouragement, and learning resources, students are more likely to believe in their mathematical abilities. The Monitor role had a smaller positive effect, while the Mathematics Content Adviser role showed a slight negative influence, implying that direct instructional involvement may not always be helpful. The model was statistically significant and explained 24.2% of the variance in mathematics self-efficacy,
confirming that parental involvement plays a meaningful role in shaping students' confidence in math.

These findings align with Bandura's Social Cognitive Theory, which emphasizes the role of social influences—such as parental modeling and encouragement—in shaping self-efficacy beliefs (Bandura, 1997). Recent studies support this view. Wu et al. (2022) found that parents with higher self-

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efficacy were more positively involved in their children's math learning, which in turn enhanced students' motivation and engagement. Similarly, Outhwaite et al. (2025) highlighted that parental self-efficacy in supporting math at home predicted the frequency of math-related activities, reinforcing the importance of affective support. These findings suggest that not all parental involvement is equally effective—supportive and autonomy-encouraging roles are more beneficial than directive or controlling ones. This implies that parents should empower rather than pressure students, helping to build a more positive and confident mathematical mindset.

Regression Analysis on the Influence of the Domains of Students' Attitude to Mathematics Self-Efficacy

Shown in table 6.2 is the Regression Analysis of Students' Attitude on Mathematics Self-Efficacy that presents the results of a multiple regression analysis examining how four attitudinal domains—Confidence, Enjoyment, Value, and Motivation—predict students' self-efficacy in mathematics. For each domain, the table provides the unstandardized coefficient (B), the standard error of B (SE B), and the standardized coefficient (Beta), which allows for comparison of the relative strength of each predictor. The model's adjusted R^2 value is 0.659, indicating that 65.9% of the variance in mathematics self-efficacy is explained by these four predictors.
The F-statistic of 163.462 suggests that the overall model is statistically significant.

Table 6.2.
Regression Analysis on the Influence of the Domains of Students' Attitude to Mathematics Self-Efficacy

Independent Variables	Unstandardized Coefficients		Standardized Coefficients Beta	t – value	p – value	Decision
	B	***SE***				
(Constant)	0.790	0.115				
Confidence	0.245	0.037	0.290*	6.541	<0.001	Reject H_o
Enjoyment	0.147	0.039	0.186*	3.733	<0.001	Reject H_o
Value	0.045	0.029	0.057	1.554	0.121	Do not Reject H_o
Motivation	0.315	0.037	0.410*	8.466	<0.005	Reject H_o
Dependent Variable: Mathematics Self – Efficacy						

*p<0.05
R = 0.814 F – value = 163.462
Adjusted R^2 = 0.659 p – value <0.001

From the result, it showed that Motivation emerged as the strongest predictor of mathematics self-efficacy, with the highest Beta value of 0.410, followed by Confidence (Beta = 0.290), indicating that students who are more motivated and confident tend to have higher self-efficacy in mathematics. Enjoyment also had a positive effect (Beta = 0.186), suggesting that students who enjoy math are more likely to believe in their ability to succeed. Interestingly, Value, which reflects how important or useful students perceive math to be, had the smallest Beta value (0.057), indicating a relatively weak influence on self-efficacy in this model. Overall, the results highlight that internal factors such as motivation and confidence are the most influential components of students' attitudes in shaping their belief in their mathematical capabilities.

The regression analysis explored how students' attitudes—specifically confidence, enjoyment, value, and motivation—affect their mathematics self-efficacy. Among these, motivation emerged as the strongest predictor, followed by confidence, while enjoyment had a moderate effect. Interestingly, perceived value had the weakest influence. This suggests that while students may recognize the importance of mathematics, it is their internal drive and belief in their abilities that more directly shape their confidence. The model was statistically significant and explained 66.3% of the variance in mathematics self-efficacy, indicating a strong relationship between these attitudinal factors and students' belief in their mathematical capabilities.

These findings align with Bandura's (1997) Social Cognitive Theory, which emphasizes that self-efficacy is shaped by personal experiences, emotional states, and social influences. Recent studies support this view. Yang et al. (2024) found that self-efficacy significantly predicted math achievement across diverse student groups. Similarly, Laranang and Bondoc (2020) reported that students with higher motivation and confidence performed better in mathematics. These results reinforce the idea that fostering motivation and confidence is essential for building self-efficacy.

CONCLUSION AND RECOMMENDATION

Conclusion

The following conclusions were drawn based on the findings of this investigation. The level of parental involvement in terms of motivator, resource provider, monitor, mathematics content adviser, and mathematics learning counselor is moderate. The level of students' attitude toward mathematics in terms of confidence, value, enjoyment, and motivation is high. The level of mathematics self-efficacy in terms of mastery experience, vicarious experience, verbal persuasion, and affective factors is moderate.

Moreover, it was also found out that parental involvement has significant relationship with mathematics self – efficacy with correlation coefficient of 0.459. The students' attitude to mathematics self – efficacy has a strong significant relationship with 0.791 correlation coefficient. This means that as parental

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involvement and students' attitude increases, mathematics self-efficacy also increases.

Also, the regression analysis of parental involvement on mathematics self-efficacy showed that the domains that significantly influence mathematics self-efficacy are Mathematics Learning Counselor, Motivator, and Resource Provider. The model has an R^2 value of 0.254, and F-statistic of 22.491 of which suggests that the overall model is statistically significant. The Mathematics Learning Counselor role had the strongest positive influence on mathematics self-efficacy (Beta = 0.266), followed by Motivator (Beta = 0.188) and Resource Provider (Beta = 0.162). The Monitor role had a smaller positive effect (Beta = 0.101), while the Mathematics Content Adviser role showed a slight negative influence (Beta = -0.082).

On the other hand, the domains of students' attitude namely Confidence, Enjoyment, Value, and Motivation significantly influence mathematics self – efficacy with R^2 value of 0.663 and the F-statistic of 163.462. Among the domains, the result showed that motivation emerged as the strongest predictor of mathematics self-efficacy, with the highest Beta value of 0.410, followed by Confidence (Beta = 0.290), Enjoyment also had a positive effect (Beta = 0.186), and Interestingly, Value, which reflects how important or useful students perceive math to be, had the smallest Beta value (0.057). Overall, the results highlight that internal factors such as motivation and confidence are the most influential components of students' attitudes in shaping their belief in their mathematical capabilities.

Collectively, the results support the Self - Efficacy theory of Albert Bandura (1977). It represents an individual's belief in their ability to complete a given task successfully and affects and is influenced by behaviors and social/environmental variables. The SE beliefs and learners' attitude towards Mathematics are essential to the achievement of motivation, which facilitates the learner's self-regulation as well as an academic accomplishment. From a social cognitive perspective, parents play a significant role as they can help change child's attitude to develop self-efficacy

Recommendation

Based on the conclusions of this study, the following recommendations are offered:

Among the indicators of Parental Involvement, monitor got the lowest mean. Parents may improve this by checking their children's homework regularly, spend time talking with them about their progress in math, and check the results of their math quizzes, assignments and notebook. Parents may also contact teachers or even visit to school to know the progress of their children. With these, parent's role as monitor may be improved as their awareness regarding their children's status in mathematics increases.

In Students' Attitude, the indicator Motivation had the lowest mean. The students may develop their motivation by making math more personal and relevant to their life so that they may also be confident and enjoy math even more as they have value it. Teachers may help students be motivated in learning mathematics by using effective and efficient new strategies ang tactics in teaching mathematics that will cater the needs of the students to increase their motivation like integrating and relating fun real world problems that involves computation, translation of verbal phrases to mathematical phrases and vice versa, planning of strategies to be employed, and critical thinking. They may also be free and open for questions to boost students' motivation. Parents may continue to encourage their children, motivate them to learn, and spend time talking with them.

In Mathematics Self-Efficacy, the mean of Affective Factor is the lowest. This might be improved by helping the students manage their stress as soon they begin their math work so that they may feel energized, excited and enjoy being in math class. Students may increase their determination to do better in mathematics by believing in themselves and trusting the people around them. Teachers may make their lesson more engaging that student's may feel at ease. They may also be more approachable that students may feel more comfortable to ask questions whenever they don't understand the lesson. Moreover, parents may help their children improve their affective factor by acknowledging their efforts through verbal appreciation.

Additionally, Parental Involvement and Students' Attitude influence Mathematics Self-Efficacy. Parents may continue to counsel their children in learning mathematics to overcome weakness. They may figure out good approaches to help and teach them different topics. Also, their expectations may match it to their children's potential to ease their children's pressure to learn very well. On the other hand, students may look upon and appreciate the efforts of their parents and teachers for them to become motivated to learn, enjoy doing math works and have a higher mathematics self-efficacy. Students may become comfortable expressing their own ideas on how to look for solutions to a difficult problem in math by believing in themselves unafraid of making mistakes but willing to learn and improve.

Moreover, Parental Involvement and Students' Attitude predict Mathematics Self – Efficacy. The roles of parents should be strengthened to help students' mathematics self-efficacy improved. Parents may consistently monitor their children at home and in school, encourage them to continue learning at their home, provide necessary materials such as books, variety games and puzzles that encourages math development, and help them do their math homework. Also, teachers may do constant communication with the parents giving feedback about the performance of their children. School administrators may give support to teachers, parents and students by promoting excellence, providing materials at school that may support students' math skills improvement, and conducive classrooms that promotes meaningful learning. In this way, students may feel that they are surrounded with strong support and become determined, motivated, confident to do well in mathematics as they have a positive outlook in math resulting to higher mathematics self-efficacy.

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Lastly, future researchers may consider the result of this study by opening their minds in exploring the significance of this study and will be more creative with their investigations on other factors, domains, and indicators that significantly influence students' mathematics self-efficacy.

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