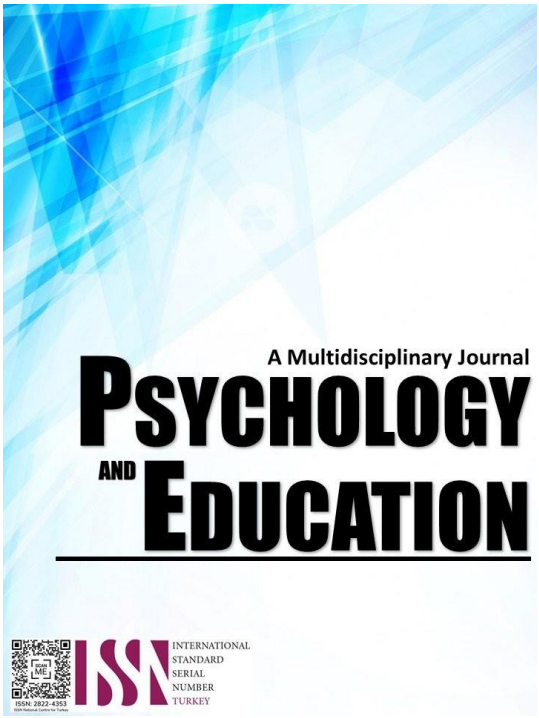
PARENTAL INVOLVEMENT AND MOTIVATIONAL STRATEGIES OF TEACHERS AS PREDICTORS OF STUDENTS' LEARNING INTEREST TOWARDS MATHEMATICS



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Research Article

Parental Involvement and Motivational Strategies of Teachers as Predictors of Students' Learning Interest towards Mathematics

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Abstract

This study investigates the impact of parental involvement and teachers' motivational strategies on students' interest in learning mathematics. Using a quantitative approach with 353 freshmen in Basic Math, data were collected through an adapted survey and analyzed using Pearson's r to assess variable relationships. Significant positive correlations were found, with r-values ranging from 0.447 to 0.541 ($p = 0.001$), except for a weaker correlation in monitoring ($r = 0.253$). Results indicate that active parental engagement and teacher motivation strategies foster a positive math learning attitude, enhancing academic performance. However, parental roles as motivators and math content advisors were not significant predictors of learning interest ($p = 0.069$ and 0.802). The study suggests that while parents may find it challenging to fulfill these roles due to limited math knowledge, maintaining supportive relationships and offering encouragement can still positively influence their children's learning interest.

Keywords: *MAED Teaching Mathematics, parental involvement, motivational strategies of teachers, student learning interest, correlational study, Philippines*

Introduction

Mathematics is widely recognized as a foundational pillar for the advancement of science and technology within any nation, playing a crucial role in fostering economic and technical development (Adigun, 2018). It is considered a mandatory subject due to its pivotal role in shaping a nation's progress. When it comes to mastering mathematics, one of the key factors influencing students' achievements or their avoidance of the subject is their level of interest (Kihwele & Mkomwa, 2021). However, it is important to note that mathematics is an abstract discipline, and this abstract nature often leads to a decline in student interest, resulting in subpar academic performance (Yeh et al., 2019). Undeniably, the correlation between disinterest in mathematics and low academic performance in the subject is evident.

Globally, the issue of students' underperformance in mathematics has posed significant challenges. In Tanzania, the prevailing problem of poor academic results is closely linked to students' lack of enthusiasm for mathematics, with many students finding the subject uninteresting and dull (Mazana et al., 2020). Similarly, in the United States, there is a widespread concern about students' subpar achievements in math (Guhl, 2019). This trend is largely attributed to the negative attitudes held by students towards the subject, which, in turn, diminishes their interest and ultimately leads to unsatisfactory performance (Mazana et al., 2019). Meanwhile, in the Philippines, (Peteros et al. 2020) reported that the performance levels in mathematics in the year 2020 were disappointingly low, with the majority of students struggling in the subject. This suggests that many teachers may be failing to create an engaging and enjoyable learning experience for their students in the realm of mathematics.

Students' interest plays a pivotal role as an internal factor influencing their academic achievements. It is not a spontaneous occurrence but rather develops through active participation, experiences, and habitual engagement in learning or work. In the context of mathematics education, the significance of interest cannot be overstated. Individuals who exhibit a strong interest in mathematics tend to be highly motivated, which, in turn, fosters a positive attitude toward the subject (Hwang & Son, 2021). However, cultivating and sustaining students' interest in learning mathematics can be a challenging task for educators. It is worth noting that a loss of interest in mathematics is a primary contributor to students' academic struggles, as students tend to excel in tasks that genuinely captivate their interest (Adigun, 2018).

Boosting students' enthusiasm in learning mathematics depends on several aspects, with instructors and parents playing critical roles in cultivating early math comprehension. Establishing a solid foundation and implementing effective teaching strategies and interventions are essential to prevent ongoing math- related challenges for students during their elementary school years (Guhl, 2019). The involvement of parents is particularly significant in this endeavor. When parents demonstrate a genuine interest in their children's mathematical efforts and progress, and express confidence in their capabilities, it has a notably positive impact on students' academic achievements (Murphy et al., 2023; Rodríguez et al., 2017). Parents, as the earliest and most influential educators in a child's life, exert a considerable influence on their educational journey, given that students spend more time at home than in schools. As a matter of fact, parental involvement can address students' psychological needs, ultimately fostering a conducive environment for positive mathematical achievements (Huang et al., 2021).

Moreover, motivational strategies employed by teachers significantly enhance students' interest in studying mathematics. Among the external factors influencing students' interest and motivation to learn, the teacher's influence stands out (Tambunan, 2018; Yusuf & Dada, 2016). Teachers bear a crucial responsibility in nurturing students' enthusiasm for mathematics and motivating them to excel in the subject. Studies have consistently highlighted the teacher's pivotal role in enhancing students' interest and motivation in mathematics

(Tambunan & Naibaho, 2019). Recognizing the importance of interest and motivation in mathematics education, some practitioners in the field of mathematics education conduct research, assess learning styles, and develop various teaching approaches or models to ensure that students remain motivated and engaged in their mathematical learning (Tambunan et al., 2020).

While previous research has explored the connections between parental involvement and students' interest in learning mathematics (Myers, 2021), as well as the impact of motivational strategies of teachers on students' interest in mathematics (Tambunan, 2018), many of these studies have primarily focused on examining these relationships separately. Moreover, these studies have often been conducted on an international scale and have centered on elementary and secondary school students. The literature reveals a gap in the investigation of the interplay among parental involvement, teachers' motivational strategies, and students' learning interest—particularly among college freshmen.

Furthermore, the specific context of Davao de Oro has not been explored in existing studies regarding the association between parental involvement and students' interest in mathematics, as well as the impact of motivational strategies of teachers on students' interest in the subject. This research gap has served as the driving force behind the current study, which seeks to fill this void and shed light on the relationships among these variables in the unique context of Davao de Oro.

The primary objective of this research is to assess and quantify the extent of parental involvement, teachers' use of motivational strategies, and students' levels of interest in mathematics. The study addresses several objectives: to describe the level of parental involvement, focusing on roles such as motivator, resource provider, monitor, mathematics content advisor, and mathematics learning counselor; to describe the level of teachers' motivational strategies, including cognitive, metacognitive, and resource management strategies; and to describe students' level of interest in mathematics, in terms of emotion, engagement, knowledge, and value.

Additionally, this study seeks to ascertain whether a significant relationship exists between parental involvement and students' interest in mathematics, as well as between teachers' motivational strategies and students' interest in mathematics. It also aims to identify which domains of parental involvement and teachers' motivational strategies significantly predict students' interest in mathematics.

To test these relationships, the study examines the following null hypothesis at a 0.05 level of significance: there is no significant relationship between parental involvement and students' interest in mathematics, there is no significant relationship between teachers' motivational strategies and students' interest in mathematics, and no predictive effect of the domains of parental involvement or teachers' motivational strategies on students' interest in mathematics.

This study is primarily grounded in Vygotsky's Social Constructivism theory, as articulated in his work from 1968. This theoretical framework places emphasis on the learner's active construction of knowledge within a social context, highlighting the integral roles of parental involvement and teacher support in this process (Cobb, 1994; Ates, 2021, Erbil, 2020). Furthermore, the theory of symbolic interactionism has been employed within the field of mathematics education to elucidate the process through which meaning is generated via social interactions (Yackel & Cobb, 1996; Grimell, 2023).

In the realm of this theory, students are viewed as active constructors of knowledge, drawing upon their accumulated experiences from their surroundings. Cognitive constructivism's subset, social constructivism, emphasizes collaborative learning where kids create knowledge with peers, teachers, and parents. It emphasizes facilitators and collaboration in learning. Within social constructivism, a child's knowledge is not exclusively molded by physical experiences. Instead, it develops through human interactions with a cultural, meaningful, and significant environment (Akpan et al., 2020).

Furthermore, this theory strongly supports the creation of opportunities that promote collaboration among students, teachers, and parents in the creation of wisdom and the enhancement of understanding. Kapur (2018) observed that the social construction of knowledge transpires through multiple methods and in various contexts. In educational or training institutions, social media platforms, religious communities, and marketplaces, facilitation might take the shape of group discussions, teamwork, or other instructional interactions. Students, through their interactions with others and their navigation of both tangible and intangible elements of their environment, acquire significant insights and experiences. These experiences are essential for providing the knowledge and skills required for leading successful and functional lives.

Another pertinent theory underpinning this study is the Expectancy-Value Theory, which revolves around the concept of motivation and can offer insights into why parents exhibit varying levels of motivation when it comes to assisting their children in meaningful ways with their mathematics education, as previously identified in research (Cai, 2003). Studies have demonstrated that the performance of children in mathematics can be substantially improved by the active involvement and roles of their parents in their education (Cai, 2003; Siegler & Mu, 2008).

Parental engagement has demonstrated a beneficial effect on improving children's academic achievements while also fostering their social and emotional development. The strengthening of connections between parents and schools is clearly linked to an increase in students' achievements. A clear link can be observed between the extent of parental involvement in their children's educational activities and the resulting enhancement in their children's academic performance (Ates, 2021; Castro et al., 2015).

To illustrate, parents' active participation contributes to the enhancement of their children's proficiency in reading, science, and mathematics (Mirazchiyski & Klemencic, 2014; Zimmer, 2024). Significantly, parents' active involvement and their expectations

during their children's learning journey play a crucial role in assisting their children in overcoming anxiety, which, in turn, contributes to improved mathematics achievement in areas like word problems and algebraic reasoning (Macmull & Ashkenazi, 2019; Vukovic et al. 2013). Furthermore, Wang et al. (2021) have noted an indirect connection between interactions between fathers and children and a child's academic performance, with self-esteem acting as a mediator in this relationship. Notably, students who receive strong support from their families tend to adopt a positive attitude toward their learning, which, in turn, has a beneficial impact on their academic outcomes (Mao et al., 2021).

In the realm of education, the classroom teacher wields the most significant influence on students' achievement and motivation within the school environment. Consequently, educators and teachers bear a profound responsibility to employ teaching strategies that effectively sustain or enhance engagement and motivation among their students. These strategies should be designed to cater to students' individual needs, stimulate intrinsic motivation, and foster the cultivation of positive and constructive attitudes. It is noteworthy that many of these teaching strategies geared toward increasing student motivation also yield positive effects on academic achievement (Anwer, 2019).

Multiple effective strategies exist to enhance student engagement and motivation within the classroom setting. These involve fostering collaboration among students, presenting mathematics lessons in engaging and relevant ways, and ensuring that mathematical concepts are contextualized effectively. Additionally, it is crucial to determine which elements of mathematics are truly engaging for students. An effective strategy includes prompting students to investigate mathematical concepts through mathematically rich contexts by employing open-ended questions and tasks. This approach cultivates curiosity and increases student interest (Bouzid, 2020).

Additionally, in alignment with the expectancy theory, Green et al. (1999) posited that academic lessons within classrooms encompass both academic and social dimensions. The academic aspect pertains to the lesson's structure and content, while the social dimension communicates what learners perceive as important in terms of what they should do and learn. It is crucial for teachers to recognize that their contribution to the learning process extends beyond the confines of specific academic content. The nature of individual interactions between learners and teachers in classrooms significantly influences learners' expectations regarding their future success. Based on expectancy-value theory, many motivational tactics have been recognized to improve learners' success expectations and cultivate their valuation of learning activities. These tactics function as essential instruments for educators aiming to foster a good and engaging learning environment (Green, 2002; Loh, 2019).

Meanwhile, numerous factors associated with low performance in mathematics include students' disinterest in the subject, the perception of mathematics as intricate, diminished self-confidence, discouragement stemming from unsatisfactory classroom test results, underprivileged backgrounds, and the perceived irrelevance of mathematical content to real-life contexts (Mazana et al., 2019). In response to these issues, educators have been actively investigating creative methods to stimulate students' interest in mathematics to improve academic achievement. The mathematics island concept (Yeh et al., 2019), task design strategies (Coles & Brown, 2016), and mobile learning in mathematics (Ndume et al., 2020) are among the pedagogical innovations. Teachers' motivational tactics are crucial in fostering and enhancing students' enthusiasm in mathematics study.

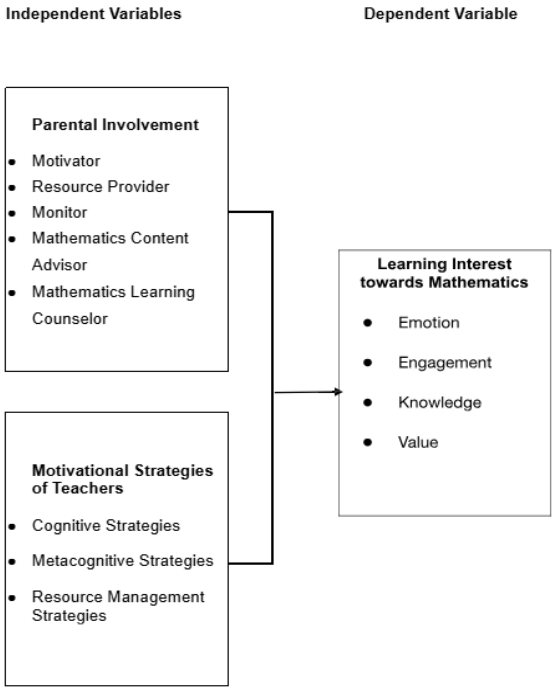

Figure 1. *The Conceptual Framework of the Study*

Figure 1 presents the conceptual framework of the study. The involved variables in this academic journey are parental involvement, motivational strategies of teachers, and learning interest towards Mathematics. The independent variables are parental involvement and teachers' motivational strategies while the dependent variable is learning interest towards Mathematics. Apparently, the framework shows the interrelationship of the involved variables.

The first independent variable is parental involvement which has five observed indicators, namely: motivators, resource providers, monitors, mathematics content advisors, and Mathematics learning counselors (Cai et al., 1996; Cai et al., 1999; Dela Cruz & Natividad, 2022). This study defines motivators as the emotional support that parents provide for their children's learning. The term resource provider describes the parents' role in supplying necessary resources for learning Mathematics. Mathematics content advisors refer to parents who offer guidance on Mathematics content. Monitors are characterized by the parents' involvement in tracking their children's learning and progress. Lastly, Mathematics learning counselors are parents who comprehend their children's current circumstances, learning challenges, potential, needs, and demands, and offer suitable support to assist their children in overcoming learning obstacles.

The second independent variable pertains to the motivational strategies employed by teachers. The framework includes three indicators: cognitive strategies, metacognitive strategies, and resource management strategies, along with informational resource management strategies (Pintrich & De Groot, 1990; Wang, 2021). This study defines cognitive strategies as the methods employed by teachers to create a framework for learning when tasks cannot be accomplished through sequential steps. Metacognitive strategies are characterized as the memorable plans or approaches that enable students to engage in problem-solving. Resource management strategies encompass time management, learning environment management, effort management, and the utilization of support from others by teachers.

Meanwhile, the dependent variable is learning interest towards Mathematics. It has four indicators, namely: emotion, engagement, knowledge, and value (Snow, 2011). In this study, emotion refers to positive feeling towards Math; engagement refers to the commitment in learning towards Math; knowledge refers to the extent of information and skills towards Math; and value refers to students' high regards towards Mathematics.

As reflected in the framework, parental involvement leads to developing students' learning interest towards Mathematics. As highlighted by Naite (2021), parents are among the most important contributors to the growth and development of their children. This is as a result of the authority and talent that they possess to mold and develop their children into persons who are motivated, inspired, and lenient by their explicit involvement in the process of learning activities. On the other hand, parents who do not participate in their children's educational process are merely thought to be negligent, which is a way of demoralizing and demotivating their children. In consequence, this has a detrimental impact on the accomplishments that they have achieved.

Parents that remains active in the school system see improvements in their children's behavior and attendance, grades, social skills, and school adaptation. Additionally, children whose parents participate in school activities are less likely to experience behavioral problems or low self-esteem. Additionally, teachers gain from parent involvement as well. Teachers are more prepared when they have more information about their pupils, and they feel more empowered to push children to learn more and take academic risks when they know they have their parents' support (Casey, 2022).

Meanwhile, motivational strategies of teachers are also linked to students' learning interest towards Mathematics. In order to increase students' interest for mathematics, educators implement motivation strategies that include recognition, rewards, encouragement, and praise (Kihwele, 2021). Numerous students will be unable to enhance their academic performance in the absence of appropriate teaching methods and the efficient utilization of allotted instructional time (Mosha, 2018). It is likely that the teaching methods employed were less effective and impactful, as students have encountered difficulty in developing a mathematical skill. The academic performance of students in mathematics is substantially enhanced by innovative instructional methods (Abd-Algani, 2019).

Hopefully, the present study aims to provide a significant contribution and a clear understanding of the three variables, which will serve as the foundation for formulating and improving existing policies within the educational context. This could indicate the programs or activities that need to be prioritized and implemented to enhance students' interest in learning Mathematics. It is commonly accepted that interest plays a crucial role in the learning of mathematics (Wong & Wong, 2019; Yu & Singh, 2016). Students exhibiting a greater interest in mathematics demonstrated reduced performance-avoidance goals across both high and low cognitive process mathematical tasks (Gilbert, 2016; Hwang & Son, 2021).

From the global perspective, this study may address the long-overdue global issue regarding students' lack of interest in Math which is believed to be affected by several factors. This undertaking would serve as additional inputs regarding learning interest towards Mathematics considering the other factors such as parental involvement and teachers' motivational strategies. This study shall benefit relevant institutions in the local setting, namely: CHED officials, school administrators, Math teachers, students, and researchers.

For the CHED officials, it will serve as their basis on formulating policies or existing policies relevant to intensifying students' learning interest in Mathematics. With this, they may craft relevant and appropriate interventions to reinforce the interest of students in Math by helping teachers to be equipped with varied motivational strategies in teaching Math and helping teachers to be oriented of different means in motivating parents to get involved in the academic welfare of their children.

In the case of the school administrators, they may create school-based programs, projects, and initiatives that help college instructors

to improve their craft in teaching specifically on their motivational techniques in helping their students to get interested in Mathematics. More so, they may provide to be equipped with varied motivational strategies in teaching Math and helping teachers to be oriented of different means in motivating parents to get involved in the academic welfare of their children. Teachers, on the other hand, may embrace all the learning opportunities provided to them which would be beneficial to students. Finally, for the researcher community, the researchers may consider this study as a prototype model. They may further explore the involved variables considering other research approaches.

Methodology

Respondents

The study's respondents were freshman students who were enrolled in colleges within District I, Davao de Oro province, namely Davao de Oro State College – Compostela and Montevista Branch, and Monkayo College of Arts, Sciences and Technology, and were currently taking the subject Mathematics in the Modern World. There were 353 respondents to this study, comprising 182 respondents from Monkayo College of Arts, Sciences and Technology (MONCAST), 120 respondents from DDOSC-Compostela Branch, and 51 respondents from DDOSC-Montevista Branch. To select the participants for this study, the process involved utilizing stratified random sampling. In stratified sampling, the entire population was divided into distinct strata or groups, and samples were selected from each stratum according to specific criteria. The overall approach was referred to as stratified random sampling when the sampling procedure employed within each stratum was simple random sampling (Thomas, 2020).

This research endeavor took place within three of the colleges located in Davao de Oro, a province well-regarded in Region XI. The researcher noted a significant gap in existing studies conducted in this province, particularly in the realm of students' learning interest in mathematics, considering both parental involvement and teachers' motivational strategies. This dearth of research in the area motivated the researcher to undertake this study, especially given her current employment at one of the colleges in Davao de Oro. Furthermore, it was worth highlighting that no precise data or her current employment at one of the colleges in Davao de Oro. Furthermore, it was worth highlighting that no precise data or statistics had been documented thus far, presenting a comprehensive assessment of students' learning interest in mathematics, taking into account parental involvement and teachers' motivational strategies in the context of Davao de Oro.

In the process of selecting respondents, specific criteria were taken into account. The study targeted college freshmen or first-year college students, both male and female, who were currently enrolled in courses that included a mathematics component or basic math subject. This criterion ensured that participants had relevant experiences to assess parental involvement in mathematics, evaluate their teachers' motivational strategies in teaching mathematics, and gauge their own learning interest in the subject. Consequently, sophomore, junior, and senior students, staff, faculty, administration, and parents were excluded, as well as freshmen who were not enrolled in courses that included mathematics.

Moreover, it was essential to emphasize those respondents who may have felt uncomfortable or uneasy about completing the survey questionnaire had the autonomy to opt out of participation. They were not compelled to take part in the study, and their decision to withdraw was fully respected. The well-being and comfort of the respondents were of paramount importance throughout the research process.

Instrument

Three instruments were employed in this study, all of which had been tailored to suit the research objectives. These questionnaires had been adjusted with the guidance of experts, and a few of them were standardized tools sourced from the internet.

The Parental Involvement Questionnaire (PIQ) used in this study had been adapted from prior research conducted by Cai, Moyer, and Wang (1996) and Staples (2018). It comprised a total of 25 items, distributed among five categories: motivator, resource provider, monitor, Mathematics content advisor, and Mathematics learning counselor. To ensure its appropriateness and effectiveness, the questionnaire underwent a pilot testing phase.

The questionnaire assessing motivational strategies of teachers in this study had been adapted from the work of Pintrich et al. (1991) and the study of Aslam (2018). This instrument encompassed a total of 29 items and was structured around three key indicators: cognitive strategies (items 1-11), metacognitive strategies (items 1-10), and resource management strategies (items 1-8). To ensure its suitability and reliability, the questionnaire was subjected to a pilot testing phase.

The questionnaire designed to assess students' learning interest in mathematics in this study drew inspiration from the work of Snow (2011) and the study of Rajak and Gayen (2022). This instrument was composed of a total of 20 items, categorized into five variables: emotion (items 1-5), engagement (items 1-7), knowledge (items 1-5), and value (items 1-3). To verify its appropriateness and effectiveness, the survey was put through a pilot testing process.

For all the involved variables, its mean interval ranged from 1.00 to 5.00, having a descriptive level that varied from very low to very high. The appropriate interpretation scales are the following for Parental Involvement, Motivational Strategies of Teachers and Student's Learning Interest.

During the pilot testing phase, the survey was exclusively administered to freshmen students who would not be part of the actual study's respondent pool. A minimum of 50 respondents were invited to participate in this pilot testing exercise. As noted by Lewis et al. (2021), the typical sample size for pilot and feasibility studies tended to range from approximately 30 to 36 participants per group, although there was considerable variability. The researcher sought permission from the school administrator to conduct the pilot testing, oversaw the distribution and retrieval of the survey questionnaire, and subsequently collected the data obtained. Following this, the gathered data were meticulously tallied, tabulated, analyzed, and interpreted to assess whether the survey questionnaire had attained the necessary levels of reliability. The questionnaire was adapted to suit the specific context of the local setting. To enhance its precision and relevance, the refinement of the questionnaire was conducted with the guidance of the advisor and expert validators. These validators assessed the questionnaire's content for construct validity, assigning ratings to determine its quality and appropriateness as a research tool.

Procedure

This study falls under the domain of quantitative research, employing a descriptive-correlational approach with a consideration of mediating effects. Quantitative research methodologies are chosen for their capacity to elucidate and analyze problems or phenomena by collecting numerical data and subjecting it to mathematical analysis, notably through statistical techniques (Apuke, 2017).

Indeed, this research is characterized as quantitative in nature, as it revolves around the analysis of numerical data as its primary unit of examination. It also utilizes statistical tools to dissect and interpret raw data. Furthermore, this study embodies a descriptive correlation approach, signifying the primary objective is to delineate relationships between variables without delving into the establishment of causal connections (Noah, 2021).

Descriptive research is characterized by the absence of researcher control over the variables under examination, with its primary objective being the depiction of the inherent characteristics of these variables, as outlined by Sahin (2021). Conversely, a correlational research design delves into and quantifies the relationships existing between the study's variables, all without any attempt to manipulate them. Correlation analysis also evaluates the magnitude and direction of these relationships, encompassing both positive and negative directions, as well as strong and weak associations.

Within the framework of this study, a descriptive research approach was adopted as its primary objective was to assess and quantify the extent of parental involvement, teachers' motivational strategies, and students' learning interest in mathematics. Additionally, it sought to investigate the relationships between parental involvement and students' learning interest in mathematics, as well as between teachers' motivational strategies and students' learning interest in the subject.

The pilot testing involved 50 respondents and provided essential insights for the main study. Internal consistency was evaluated using Cronbach's alpha, revealing strong reliability coefficients for all constructs. Parental involvement scored 0.886, indicating high reliability, while motivational strategies for teachers achieved an impressive 0.931, reflecting excellent internal consistency. Additionally, the scale for student learning interest in mathematics recorded a Cronbach's alpha of 0.871, demonstrating good reliability. These findings confirmed the robustness of the measurement scales, validating their use in the study and supporting the accuracy of the results.

The researcher meticulously adhered to a well-defined procedure and protocol to collect data for this study. Initially, the researcher sought approval and endorsement from the University of Mindanao. . Upon securing approval, formal request letters were submitted to the CHED office and the school administrators who participated in the research. Subsequently, the researcher personally delivered the questionnaire to each respondent after getting permission from the organization's employer of institution. The research and development staffs at the Monkayo College of Arts, Sciences and Technology and Davao de Oro State College- Main Campus and Montevista Branch, they were given the survey questionnaire during the distribution procedure and asked to provide an immediate response. They got two days to fill out the questionnaire, after then the researcher collected the results.

The survey questionnaire was designed with the study's explanation and instructions integrated directly into the instrument to ensure convenience and clarity for respondents. This approach guaranteed complete correctness in the questionnaire responses. Sufficient time was allotted for respondents to provide their answers. Data collection commenced only after the paper had been thoroughly reviewed and endorsed by the University of Mindanao Ethics and Research Committee (UMERC) under Protocol No. UMERC-2024-213.

Upon completion of the questionnaire collection, the gathered data was systematically tallied, tabulated, analyzed, and interpreted in alignment with the study's objectives. Initially, the data was analyzed to extract the mean, allowing for an interpretation of the typical levels of parental involvement, motivational strategies of teachers, and student learning interest. Subsequently, Pearson r was employed to assess the significant relationships between the variables, while multiple regression analysis was utilized to determine whether the combination of independent variables significantly predicted the dependent variable.

This research strictly followed the ethical guidelines set by the University of Mindanao Ethics Review Committee (UMERC). Participants were not coerced into participating and had the freedom to withdraw from the study if they experienced any discomfort during its course. In compliance with the Data Privacy Act of 2012, which safeguards fundamental human rights concerning privacy, the identity of participants was kept confidential for their safety. This confidentiality extended to their responses to the survey

questionnaire, which were treated as confidential and provided on a voluntary basis. Since the respondents were minors, parental permission was sought, and their names were not disclosed in the survey questionnaire. The participants were made fully aware that they could leave the study at any time.

Results and Discussion

This section provides an overview of the study's findings, which were all gathered and documented from the parental involvement, motivational strategies of teachers, and students' learning interest in mathematics that were adapted and modified. The findings were then carefully examined and interpreted.

Level of Parental Involvement

Presented in Table 1 is the level of parental involvement experienced by freshman students who are enrolled in Davao de Oro State College – Compostela and Montevista Branch and Monkayo College of Arts, Sciences and Technology and are currently taking up the subject Mathematics in the Modern World. This variable consists of the following indicators – motivator, resource provider, monitor, mathematics content advisor, and mathematics learning counsellor.

The results indicate that the overall level of parental involvement has a mean of 3.669 with a standard deviation of 0.708, signifying a high level of parental engagement in the students' academic lives. This high mean suggests that parental involvement is notably observed and plays an influential role in the academic endeavors of the respondents. The findings aligned with Dela Cruz and Natividad's (2022) perspective that parental involvement is a critical factor in students' educational journeys, contributing to improved academic performance, positive behavior, and emotional growth. This view challenges the findings of Dwyer and Hecht (2019), who noted a generally low level of parental involvement in schools, suggesting that not all parents actively engage in their children's academic achievements and activities. Enthusiastically involved parents can help cultivate positive behaviors, strengthen motivation, and support the emotional development of their children. This level of involvement, as observed in the study, demonstrates how parents can act as pivotal figures in their children's educational progress, providing resources, guidance, and encouragement that collectively contribute to academic success.

Table 1. *Level of Parental Involvement*

Indicators	*Mean*	*SD*	*Descriptive Level*
Motivator	3.929	0.752	High
Resource Provider	3.769	0.771	High
Monitor	3.377	0.906	Moderate
Mathematics Content Advisor	3.619	0.959	High
Mathematics Learning Counsellor	3.653	0.891	High
Overall	3.669	0.708	High

Table 1 shows a mean score of 3.929 (SD = 0.752) for the "Motivator" dimension of parental involvement, indicating a high level of parental engagement in motivating their children. This suggests that parents are actively encouraging and inspiring their children's academic efforts. In synced with the study of Sak et al. (2021), parents play a crucial motivational role by using strategies that align with their children's individual personalities and developmental stages, fostering positive attitudes toward learning. Parents contribute as motivators by helping set goals, offering rewards, sharing examples, and providing daily support. However, the effectiveness of these strategies depends on aligning them with children's developmental stages, as motivational needs evolve over time. Younger children may respond more to external rewards, while older students benefit from encouragement fostering autonomy. This highlights the need for flexibility in parental motivation strategies to support children's growth and engagement throughout their educational journeys.

Secondly, the "Resource Provider" dimension of parental involvement has a mean score of 3.769 (SD = 0.771), indicating a high level of involvement among parents in providing necessary learning resources. Conforming to the study of Manlangit et al. (2020), as cited by Agua and Balasabas (2022), parents bear significant responsibility for supplying resources that enhance their children's learning experiences. The findings emphasize that parents who create a supportive, resource-rich environment enable their children to better absorb and understand academic content. This underscores the critical role parents play as resource providers, supporting students' daily educational needs and contributing positively to their school success.

Meanwhile, the "Monitor" dimension of parental involvement has a mean score of 3.377 (SD = 0.906), indicating a moderate level of parental engagement in overseeing their children's academic activities. This level suggests that monitoring is a noticeable aspect of parental involvement. Integrated with the study of Ayimbila et al. (2022) found that parents' monitoring of academic performance is one of the most effective methods for upholding high educational standards and supporting positive outcomes. Additionally, monitoring children's behavior plays a crucial role in fostering long-term academic success. The study underscores the importance of parents actively engaging in monitoring to positively influence their child's educational journey.

Correspondingly, the indicator, Mathematics Content Advisor, obtains a mean of 3.619 with a standard deviation of 0.959. This suggests a high level of involvement indicating how parents take up the role of becoming mathematics content advisor in their children's

academic endeavors. Similarly, Agua and Balasabas (2022) , in their study, also found that parents strongly exert effort in comprehending mathematical concepts that their child is learning in order to provide them an explanation as to how such concepts are to be utilized in their daily lives. These acts of effort can be exhibited when parents attempt to help their child in answering their mathematics activities and assignments at home.

In a similar note, the indicator, Mathematics Learning Counsellor, garners a mean of 3.653 and a standard deviation of 0.891, indicating a high level of description. This suggests that parents can sometimes serve as math learning counselors for their children. Alongside this, Dela Cruz and Natividad (2022), in their study, emphasized how parents' can align their personal expectations with their child's innate potential by making an effort to identify their child's strengths and weaknesses in Mathematics. Furthermore, it was noted that favorable outcomes would arise when parents served as counselors in their child's academic life. These results include, but are not limited to, higher student attendance, school happiness, improved academic performance and motivation, responsibility, confidence, and less discipline problems.

Level of Motivational Strategies of Teachers

Presented in Table 2 is the result on the level of motivational strategies employed by teachers towards their students in learning mathematics. This variable includes the following indicators – cognitive strategies, metacognitive strategies, and resource management strategies.

Overall, the level of motivational strategies employed by teachers garners a mean of 4.119 and a standard deviation of 0.558. This indicates a high degree of evidence suggesting how motivational strategies of teacher are truly observed and exhibited in helping students learn especially in mathematics. Similarly, Perez and Pulana (2022), in their study, also discussed that teacher' motivation serves as a critical factor influencing their effectiveness in teaching. As such, allowing teachers to employ motivational strategies in classrooms would have a significant influence in nurturing the minds and hearts of every learner. In the long run, their motivational strategies were also found to have significant effect in improving learners' academic and behavioral success.

Table 2 presents the indicator, Cognitive Strategies, with its mean, 4.085, and standard deviation equating to 0.671. This indicates a high degree of cognitive strategies utilized by teachers as a form of motivational strategy in helping their students learn mathematical concepts. In support of this, Muwonge et al. (2019) further stressed how the use of cognitive learning strategies in motivating students such as organization, elaboration, and critical thinking becomes positively correlated with their academic performance. In addition, their study also emphasized that giving student an ample amount of opportunity to use certain cognitive learning strategies significantly contributes not only to their academic processes, but also to their motivational beliefs and self-efficacy.

Table 2. *Level of Motivational Strategies of Teachers*

Indicators	*Mean*	*SD*	*Descriptive Level*
Cognitive Strategies	4.085	0.671	High
Metacognitive Strategies	4.071	0.655	High
Resource Management Strategies	4.200	0.616	Very High
Overall	4.119	0.558	High

Similarly, the indicator, Metacognitive Strategies, garners a mean of 4.071 and a standard deviation of 0.655, indicating a high degree of metacognitive strategies employed by teachers in order to fully motivate their students in learning mathematics. Aligned with this, Durukan et al. (2022) explained in their study, allowing students to exercise their metacognition stimulates awareness about instructional designs and processes, as well as the reasons behind such in classroom contexts through the idea of defining, reflecting, and assessing. Furthermore, when teacher's aide in developing students' metacognitive skills, the predetermined learning outcomes will be fostered and achieved.

Lastly, the indicator, Resource Management Strategies, obtains a mean of 4.200 and a standard deviation of 0.616. This result points to a very high degree of resource management strategies being utilized by teachers so as to help students learn mathematical concepts. Accordingly, this result also concurs with the findings entailed by the study of Mutungwa and Orodho (2014) in which resource management strategies, such as human skills, information technology, and inventory and financial resources skills, provide a positive impact towards the enhancement of schools' academic performance. More so, it was also discussed that resource management strategies, when efficiently and effectively deployed by teachers, become very critical in the academic processes when necessary. Furthermore, teaching and learning resource availability also helps teachers employ effective teaching, providing students with conducive and comfortable learning environment.

Level of Student Learning Interest

Displayed in Table 3 is the result on the level of student learning interest towards mathematics. This variable includes the following indicators – emotion, engagement, knowledge, and value.

Overall, the variable, Student Learning Interest, garners a mean of 3.758 and a standard deviation of 0.691. This indicates a high extent of learning interest as shown by the respondents in their mathematics classes. Despite mathematics being an abstract subject causing several learners to lose interest, echoing this, Peteros (2020) posited that recognizing and rewarding learners for their performance in

mathematics classes boosts their interest and confidence in the subject. Furthermore, it was reported how employing enjoyable and engaging activities clearly helps in enhancing the performance of students since interest significantly plays a critical role in the teaching-learning process. As such, when student interest is piqued, academic performance also improves in the process.

As presented, the garnered mean on the indicator, Emotion, settles at 3.875, alongside a standard deviation equal to 0.831. This leads to a high level of emotion that is exhibited by the respondents, that is, positive feeling or or liking towards learning mathematics. Related to this, Forsblom et al. (2022) explained how emotions play such a vital role in classroom contexts, emphasizing how emotions affect students' interest, motivation and self-regulated learning. Hence, teachers are encouraged to pique their students' emotions in order to improve academic achievement. Furthermore, it was also found that harboring positive feelings also influence students' career choices, establishing the ideas that harnessing these emotions are instrumental to students' lifelong learning.

Table 3. *Level of Student Learning Interest*

Indicators	*Mean*	*SD*	*Descriptive Level*
Emotion	3.875	0.831	High
Engagement	3.391	0.946	Moderate
Knowledge	3.752	0.792	High
Value	4.015	0.810	High
Overall	3.758	0.691	High

While engagement obtains a mean of 3.391 and a standard deviation of 0.946. Thus, it can be interpreted that there is a moderate degree of engagement as recorded from the respondents when it comes to their commitment to learn mathematics. In parallel with this, Sen (2022) explained in his how students' engagement in mathematics subject becomes an expression of their own passion for acquiring the lesson, proficiency, as well as esteem for solving mathematical problems. Furthermore, it was also emphasized that the more involved a student is in learning, the more open he is to learning. With this, participation in mathematics is crucial for every student's acquisition of mathematical understanding and abilities.

Subsequently, the indicator, Knowledge, garners a mean of 3.752 and a standard deviation of 0.792. This indicates a high degree of information and skills recorded from the respondents when it comes to their interest in learning mathematics. As the study and findings of Bone (2021) entailed, in order to improve learners' knowledge, skills, and achievement in mathematics, there must be a growing demand for progress monitoring tools since these will be handy in assessing their current learning, predicting their future performance, and facilitating their teachers' efforts in preparing effective instruction. In a nutshell, it is imperative to employ monitoring procedures to fully ensure the extent of students' knowledge and skills in mathematics.

Lastly, the indicator, Value, arrives at a mean of 4.015 and a standard deviation of 0.810, indicating a high level of value that the respondents exhibit in showing their interest in learning mathematics in instructional contexts. This result is backed up by the study of Ryan et al. (2022) in which they concluded that students enjoy and value the subject more when their motivation is piqued through appropriate intervention strategies including instructional practices and processes. Moreover, students who also engage in mathematics-related behaviors such as taking part in mathematics contests and clubs were also found to enjoy and value the subject more. With this extent of value towards mathematics, students were also implied to pursue mathematics or mathematics-related disciplines in higher education.

Relationship between Parental Involvement and Student Learning Interest

Presented in Table 4 below are the results on the test of relationship between parental involvement and learning interest of the students in mathematics.

Table 4. *Relationship between Parental Involvement and Learning Interest of the Students towards Mathematics*

Indicators	*Dependent Variable*	*r-value*	*r2*	*p-value*	*Decision*
Motivator	Learning Interest of the Students towards Mathematics	0.459*	0.2107	<0.001	Reject Ho
Resource Provider		0.541*	0.2927	<0.001	Reject Ho
Monitor		0.253*	0.0640	<0.001	Reject Ho
Mathematics Content Advisor		0.447*	0.1198	<0.001	Reject Ho
Mathematics Learning Counsellor		0.476*	0.2268	<0.001	Reject Ho

The table summarizes the indicators of parental involvement, whether it has a significant relationship towards the learning interest of the respondents in mathematics. The indicators, Motivator, Resource Provider, Monitor, Mathematics Content Advisor, and Mathematics Learning Counsellor, all show significant positive relationship towards the learning interest of students towards mathematics with p-value < 0.001, hence the null hypothesis is rejected. The indicators, motivator, resource provider, mathematics content advisor, and mathematics learning counsellor all have moderate correlation with the students' learning interest as reflected on their r-values, 0.459, 0.541, 0.447, and 0.476, respectively. Meanwhile, the indicator, monitor, possesses weak positive correlation with

an r-value of 0.253.

This result is in accordance with the study of Durisic and Bunijevac (2017), in which they discussed how the six factors of parental involvement – parenting, interacting, helping others, studying at home, making decisons, and working together with the community – lead to various results for the schools' stakeholders. Also, parental involvement provides motivation for learners to engage in the teaching-learning process which, in turn, would significantly improve their academic performance. Similarly, Kaukab (2016), in her study, also provided evidence that effective parental involvement keeps the student motivated, interested, and keen in their works, bridging the gap between the school and the parents. Furthermore, parental involvement was described to not only enhance students' learning but also facilitate the overall development of the learners' personalities and behaviors.

Relationship between Motivational Strategies and Student Learning Interest

Presented in Table 5 below is the result on the test of significant relationship between the motivational strategies employed by teachers and learning interest of the students towards mathematics. The table summarizes the indicators of motivational strategies, whether it has a significant relationship towards the learning interest of the respondents in mathematics.

The indicators, Cognitive Strategies, Metacognitive Strategies, and Resource Management Strategies, were found to have significant relationship towards student learning interest in mathematics. With p-value < 0.001, the null hypothesis can then be rejected, thus, concluding that the motivational strategies employed by the teachers are significantly correlated with the interest of the students to learn mathematics content. More so, the indicators, cognitive strategies, metacognitive strategies, and resource management strategies, all possess moderate positive correlation with student learning interest as reflected on their r-values, 0.480, 0.519, and 0.462, respectively.

Similarly, Pulana and Perez (2022), in their study, stressed how improving the motivational strategies employed by teachers become significantly influential on the learners' academic and behavioral success as their motivation is considered as a crucial element influencing their own performance effectiveness. Furthermore, their study also delved into emphasizing the use of varied strategies in motivation in order to uphold student interest which, in turn, will positively influence their academic performance. The results are also in accordance with those of Elashhab (2020), highlighting that since the teachers' role to motivate unmotivated students is greatly critical, implementing motivational strategies which accommodate students' variety of learning styles is of high importance. Moreover, engaging learners in activities employing suitable materials and methods will most likely positively influence their motivation to learn, providing them a positive reflection as well, in the process.

Table 5. *Relationship between Motivational Strategies of Teachers and Learning Interest of the Students towards Mathematics*

Indicators	*Dependent Variables*	*r-value*	*r2*	*p-value*	*Decision*
Cognitive Strategies	Learning Interest of the Students towards Mathematics	0.480*	0.2304	<0.001	Reject Ho
Metacognitive Strategies		0.519*	0.2694	<0.001	Reject Ho
Resource Management Strategies		0.462*	0.2134	<0.001	Reject Ho

Regression Analysis on the Domains of Parental Involvement that Significantly Predict Learning Interest of the Students towards Mathematics

Displayed in table 6.1 is the result on the test of regression analysis on whether or not the domains of parental involvement significantly predict the interest of the learners to learn mathematics content. This test mainly focuses on the indicators of parental involvement – motivator, resource provider, monitor, mathematics content advisor, and mathematics learning counselor – and their impact towards learning interest of the respondents.

Table 6.1. *Regression Analysis on the Domains of Parental Involvement that Significantly Predict Learning Interest of the Students towards Mathematics*

Indicators	*Unstandardized Coefficients*		*Standardized Coefficients Beta*	*t-value*	*p-value*	*Decision*
	B	*SE*				
(constant)	1.669	0.173				
Motivator	0.106	0.058	0.116	1.824	0.069	Do not Reject Ho
Resource Provider	0.339	0.055	0.378*	6.136	<0.001	Reject Ho
Monitor	-0.110	0.042	-0.114*	-2.615	0.009	Reject Ho
Mathematics Content Advisor	0.014	0.056	0.019	0.251	0.802	Do not Reject Ho
Mathematics Learning Counsellor	0.196	0.058	0.253*	3.379	<0.001	Reject Ho
Dependent Variable: Learning Interest of the Students towards Mathematics						

**p<0.05 R-value = 0.592 F-value = 37.401 R2 = 0.350 p-value < 0.001*

Table 6.1 displays an R-value of 0.592, a p-value<0.001, R2 of 0.350, with a significance of 0.05. Further, when taken as a whole, parental involvement significantly predicts student learning interest with an R-value of 0.592. Moreover, the parental involvement domains account for 35% of the variance in the degree of student learning interest. The rest of 65% is due to random variation, indicating that other variables not included in the study could also affect how much of an influence there is on students' interest in learning.

The test indicates that the indicators, resource provider, monitor, and mathematics learning counsellor, significantly predict the level of students' learning interest towards mathematics. In addition, since their p-value<0.05, then the null hypothesis can be rejected. When other domains are constant, it can be implied that for every one unit increase in the level of resource provider, the level of student learning interest also increases by 0.339 units. Meanwhile, for every one unit increase in the level of mathematics learning counsellor, there is also a 0.196 unit increase in the level of student learning interest.

As continuation of this, Manlangi et al. (2020) contend that parents are accountable and responsible for the acquisition of their child's variety of materials and resources; hence they should prepare a conducive learning environment for their students at home. Furthermore, parents were found to have no challenges with the schedules of giving and retrieving modules and materials for their children according to Dangle & Sumaoang, (2020). With this, it can be concluded that when parents fulfill these roles of theirs, students become motivated to pursue learning mathematics content.

Additionally, Agua and Balasabas (2022) implied that parents' regular checking and monitoring of the child's learning progress will help build a strong foundation for student behavior, thus, impacting their motivation to learn more. When students are monitored when it comes to their current academic progress, they become more engaged in their academic life which, in turn, inspires them to do better.

Furthermore, there is enough evidence stating that parents who very strongly know their children's strengths and weaknesses find several strategies and approaches necessary to help their child overcome his/her weaknesses in learning mathematics topics. This, in turn, assists their child in keeping motivated and interest to learn even harder mathematics concepts that will boost his/her academic progress according to Agua & Balasabas, (2022).

On the contrary, the indicators, motivator and mathematics content advisor, garners p-values<0.05, thus failing to reject the null hypothesis stating that these indicators do not significantly predict the level of student learning interest towards mathematics. This result is in congruence with the study of Agua and Balasabas (2022) in which they detailed how parents find mathematics content hard to comprehend. In addition, it was found that their level of understanding when it comes to mathematics content could not permit for significant learning outcomes for their children. In light of this, since parents have a hard time understanding the subject and its topics, fulfilling the role of a motivator will oftentimes be a major challenge as well. However, maintaining healthy and strong relationships with their children and giving praise and encouragement can help facilitate their roles as motivators by Manlangit et al., (2020).

Regression Analysis on the Domains of Motivational Strategies of Teachers that Significantly Predict Learning Interest of the Students towards Mathematics

Table 6.2 presents the results on the test of regression analysis on whether or not the domains or indicators of motivational strategies employed by the teachers significantly predicts the learning interest of students towards mathematics. This test specifically focuses on the indicators – cognitive strategies, metacognitive strategies, and resource management strategies.

Table 6.2. *Regression Analysis on the Domains of Motivational Strategies of Teachers that Significantly Predict Learning Interest of the Students towards Mathematics*

Indicators	*Unstandardized Coefficients*		*Standardized Coefficients Beta*	*t-value*	*p-value*	*Decision*
	B	*SE*				
(constant)	0.876	0.231				
Cognitive Strategies	0.191	0.066	0.185*	2.874	0.004	Reject Ho
Metacognitive Strategies	0.271	0.073	0.257*	3.695	<0.001	Reject Ho
Resource Management Strategies	0.238	0.063	0.212*	3.790	<0.001	Reject Ho
Dependent Variable: Learning Interest of the Students towards Mathematics						

**p<0.05 R-value = 0.566 F-value = 54.874 R2 = 0.321 p-value < 0.001*

Table 6.2 displays an R-value of 0.566, a p-value<0.001, R2 of 0.321, with a significance of 0.05. Overall, when taken as a whole the domains of motivational strategies employed by teachers are significantly predicting students' learning interest with an R-value of 0.566. More so, 32.1% of the variance in the level of student learning interest can be explained by the level of motivational strategies employed by teachers. The remaining 67.9% is random fluctuation, indicating that other factors not examined in the study may also have an impact on the amount of effect on student learning interest.

As the results imply, the three indicators all significantly predict the level of student learning interest given their p-values<0.05, thus rejecting the null hypothesis. It can also be concluded that for every one unit increase in the level of cognitive strategies, metacognitive strategies, and resource management strategies, the level of student learning interest also increases by 0.191, 0.271, and 0.238 units, respectively.

Corresponding to this, Dinsmore and Fryer (2019), exemplified that cognitive strategies, as something that is under motivational strategies, allow students to make progress toward solving problems and accomplishing tasks. As such, it was entailed that teachers fostering a wide array of cognitive strategies expect significant development among learners on their cognitive and motivation aspects, which include their interest in a particular learning area alongside an improvement in the knowledge bank, as well.

Aligned with this, Durukan et al. (2022) also highlighted that preparing and employing metacognition-related strategies, several aspects within students are improved such as, but not limited to, their higher-level thinking skills, problem-solving skills, and behavioral skills. These strategies were also found to significantly impact students' motivation to learn since their metacognition involves knowing how they learn best and the strengths and weaknesses that come with it.

Lastly, Alhameli and Upadhyay (2023) purported that an effective resource management strategy guarantees that every aspect of education, from school infrastructure to collaboration with parents and the community, is systematically designed and employed in order to facilitate the diverse needs of learners in instructional contexts. As such, with proper implementation of resource management strategies, this not only improves students' academic progress but also enhances student motivation and learning outcomes.

Conclusions

The results of this study pointed out the following conclusions;

First, the results inferred that that there is an overall high level of parental involvement recorded from the respondents, alongside its indicators – a high-level motivator, resource provider, mathematics content advisor, and mathematics learning, and a moderate-level monitor.

Second, the results of the study also implied a high degree of motivational strategies employed by teachers in classroom contexts. More so, there was also a high-level degree of cognitive and metacognitive strategies. On the other hand, a very high level of resource management strategies was also recorded.

In addition, as the results described, the overall level of student learning interest was recorded to be high. More specifically, its indicators, emotion, knowledge, and value, were recorded to have high degree of observation while engagement settles at a moderate level.

Moreover, the results also entailed that there is a significant relationship between the independent variables, parental involvement and motivational strategies of teachers, with the dependent variable, student learning interest. This also establishes the notion of intensifying the integration of parental involvement in the teaching-learning process to enhance student interest. Meanwhile, a wide array of motivational strategies can also be recommended in order to engender admirable student learning results.

With this, the test on regression further described that, generally, both the parental involvement and motivational strategies of teachers were found to be significant predictors of student learning interest. If there is adequate parental involvement and appropriate motivational strategies employed, then increasing student learning interest will also follow.

More specifically, the domains of parental involvement, resource provider, monitor, and mathematics learning counsellor, all significantly predict student learning interest. When parents fulfill these roles, students become much more interested and motivated to learn. On the contrary, roles such as motivator and mathematics content advisor pose as a tougher challenge as the results implied that these do not significantly predict student learning interest.

Similarly, the domains of motivational strategies, cognitive, metacognitive, and resource management strategies, all significantly predict student learning interest. This indicates that applying appropriate motivational tactics provide an avenue for learners to be engaged in teaching-learning process.

Subsequent to the careful and detailed analysis of the results that this study has garnered and the corresponding conclusions, the researcher implied the following recommendations concerning the future and implementation of the study.

First, based on the study's findings indicate that "My parents spend time talking with me about my progress in math" received the lowest mean score of 3.289, with a standard deviation of 1.042, yet still falls under a high description level within the monitoring items. To improve students' success in mathematics, it is recommended that counselors work with parents to foster a supportive, rather than directive, approach to involvement. Parents should aim to create an encouraging environment that allows children to explore mathematical concepts at their own pace. To achieve this, parents can engage in open conversations with their children about their learning goals, initiate problem-solving discussions, and celebrate even small achievements. By promoting a partnership where parents remain engaged without overwhelming their children, children will feel more empowered and take ownership of their learning journey. Therefore, finding a balanced level of parental involvement is highly recommended to create a more effective and supportive learning experience.

Second, based on table 2.2, the study identified that the items, "Our math teacher teaches us to preview and figure out the key content so that we can focus on listening to the teacher's instructions in class" and "Our math teacher teaches us to reflect on whether our mathematics learning method is effective," both received the lowest mean score of 4.040, with standard deviations of 0.821 and 0.865,

respectively, yet still maintain a high description level among metacognitive strategies. To further develop these strategies, it is recommended that educators actively engage students in their own learning processes. Teachers are encouraged to implement explicit instruction on metacognitive techniques, such as self-questioning, reflective journaling, and peer discussions. These approaches can help students become more aware of their own thought and learning processes. Creating a classroom environment that encourages students to evaluate their understanding and adapt their methods is also recommended to boost engagement and motivation. Furthermore, teachers should consider setting appropriately challenging tasks that prompt students to use these metacognitive strategies, helping them take ownership of their learning. Providing regular feedback and opportunities for reflection is highly recommended to strengthen students' metacognitive skills, which can lead to enhanced academic outcomes and a deeper interest in mathematics.

Moreover, according to Table 3.2, the study's findings reveal that "I read books about math" received the lowest mean score of 3.306, with a standard deviation of 1.186, yet still ranks high among engagement items. To boost students' interest in mathematics, it is recommended that teachers implement diverse, engaging strategies to foster active participation and intrinsic motivation. Teachers are encouraged to use interactive methods, such as collaborative learning, where students work together on problem-solving tasks, and active questioning sessions that stimulate critical thinking and encourage students to articulate their understanding. To make mathematics more relatable, incorporating real-life applications of mathematical concepts is recommended, allowing students to see the relevance of math in everyday contexts.

In addition, leveraging technology and project-based learning can create a dynamic environment that captures students' attention and fosters curiosity. By creating a supportive and inclusive classroom where students feel safe to share ideas and take risks, teachers can significantly enhance students' engagement and interest in math. This, in turn, is likely to lead to improved academic performance and a more positive attitude toward the subject.

In addition, based on Table 4 and 5, given the positive relationship between parental involvement, teachers' motivational strategies, and student learning interest, the researcher strongly recommends enhancing both parental engagement and motivational techniques used by teachers to foster student enthusiasm for learning. For parents, it is essential to recognize the significant role they play in their children's education. Beyond monitoring academic progress and behavior, parents are encouraged to take on roles as advisors and counselors, offering guidance and support that starts at home. When parents embrace these roles, they provide a strong foundation that nurtures their child's learning journey.

Additionally, parents should consider fulfilling various roles that address their children's needs and interests more holistically, which can further enhance academic and personal growth. For teachers, it is highly recommended to develop and apply effective, motivating teaching strategies that actively engage students. Incorporating reward systems, positive reinforcement, and engagement techniques can spark students' interest in learning mathematical concepts and create a more enjoyable classroom experience. Schools and institutions are encouraged to provide professional training for teachers on effective motivational strategies and engagement systems. Such training would equip educators with the tools needed to boost student interest not only in mathematics but across all subjects, helping to foster long-term academic success and essential life skills. By adopting these recommendations, parents, teachers, and schools can work together to create a supportive, motivating environment that greatly enhance students' learning experiences and outcomes.

Moreover, based on the findings in Table 6.1, parental involvement in roles such as resource providers, monitors, and mathematics learning counselors significantly influences students' interest in learning mathematics. To maximize these benefits, parents are encouraged to actively engage in their children's math education, providing emotional support and relevant content guidance. Creating a positive, supportive home environment fosters open communication, allowing children to freely share their thoughts and challenges in math without fear of judgment. Parents can enhance motivation and confidence in their children by celebrating even small achievements and setting clear, achievable goals. It is also beneficial for parents to familiarize themselves with the current math curriculum and teaching methods so they can provide appropriate support, including discussing assignments, helping with problem-solving strategies, and offering resources tailored to their children's needs. In these roles, parents significantly contribute to their children's growing interest and self-assurance in mathematics, leading to improved academic outcomes.

Lastly, based on the findings in Table 6.2, since motivational strategies employed by teachers significantly influence students' interest in learning mathematics, it is recommended that teachers place greater emphasis on metacognitive strategies, which are particularly effective in enhancing this interest. Teachers should integrate explicit instruction on metacognitive skills, such as self-regulation, goal setting, and reflective practices, to help students gain awareness of their learning processes. By teaching students how to monitor their understanding, evaluate their problem-solving approaches, and adjust their strategies as needed, educators can empower students to take ownership of their learning. Incorporating activities like think-aloud protocols and peer discussions can also enhance metacognitive awareness, encouraging students to engage more deeply with mathematical concepts. Regular feedback and opportunities for self-reflection will further reinforce these strategies, promoting a growth mindset and greater motivation in mathematics. Prioritizing metacognitive strategies will enable teachers to create a more dynamic and supportive learning environment that not only boosts student engagement but also fosters improved academic performance in mathematics. This approach supports students' long-term success by equipping them with valuable skills for self-directed learning.

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