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Impact of Learners' Psychosocial Attributes and Teachers' Instructional Characteristics on Students Performance in Mathematics

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***Abstract*: This study examined the relationship and impact of psychosocial attributes and instructional characteristics on the mathematics performance of Grade 9 students in six public secondary and integrated schools in New Bataan District, Davao de Oro, for the school year 2025–2026. Using a quantitative descriptive-correlational design, 166 respondents completed two adapted questionnaires measuring psychosocial attributes (academic self-efficacy, academic motivation, locus of control, mathematics anxiety, and peer influence) and instructional characteristics (knowledge of mathematics content, communication ability, use of appropriate teaching strategies, and classroom management skills). Data were analyzed using mean, standard deviation, Pearson r, and multiple regression. Results showed that both psychosocial attributes and instructional characteristics were often observed, indicating moderate student engagement and satisfactory teaching practices. Students' mathematics performance was nearly proficient, suggesting that adequate teaching and classroom conditions alone did not ensure full proficiency. No significant relationship was found between overall psychosocial attributes or instructional characteristics and mathematics performance; however, academic self-efficacy emerged as the only significant predictor. These findings implied that strengthening students' confidence in their abilities was more critical to improving performance than teaching methods alone, highlighting the need for interventions such as motivational activities, peer tutoring, and confidence-building strategies.**

***Keywords*: Psychosocial Attributes, Teacher's Instructional Characteristics, Mathematics Performance, Regression Analysis, Philippines.**

1. Introduction

Students' academic performance in mathematics remains a major concern worldwide. According to the [1], many nations report that a significant proportion of students do not achieve mathematical competency, hindering their readiness for higher education and employment. Accordingly, poor mathematics performance is a widespread problem in both developed and developing countries. Likewise, this difficulty stems from a variety of factors, including ineffective teaching strategies, a lack of learning components, and students' negative attitudes toward the subject.

In Ghana, as reported by [2], one study targeting 440 senior high school students in the Kumasi Metropolis identified major issues affecting mathematics achievement. The study found that a high percentage of students showed a lack of interest in studying mathematics, due to the perception that they were incapable of understanding the subject. Furthermore, the research noted that the insufficient coverage of the mathematics curriculum further worsened students' performance. Research results indicate that psychological variables, including self-efficacy beliefs, and systemic variables, such as curriculum implementation, both play significant roles in determining students' performance in mathematics.

Conversely, in Cagayan de Oro City, Philippines, learners persist in trying to cope with math because of a variety of interconnected issues preventing academic achievement. In a study by [3], it was found that, in addition to poor study habits, students experience low motivation, limited parental guidance, and insufficient classroom participation. Their research at Agusan National High School concluded that even students with an overall positive disposition toward mathematics still do not perform well due to inadequate learning strategies, fear of problem-solving, and limited reinforcement outside the classroom. Congested classrooms and limited teacher training in differentiated instruction further compound these issues.

In the Davao de Oro Division, the National Achievement Test scores for the school year 2023–2024 reveal low mathematics proficiency among both Grade 6 and Grade 12 learners, indicating serious issues in mathematics instruction. Additionally, at Cagan National High School in New Bataan District, only 42% of students across grade levels demonstrated proficiency in mathematics, with many still having difficulty with the subject. Accordingly, teachers often reported that students have little interest in studying mathematics and lack the basic skills required to comprehend higher-level lessons. Most are disengaged in class, participating very infrequently or completing assignments very infrequently. Students are unable to perform basic math operations, which leaves them frustrated and low on motivation. Also, math anxiety is prevalent, which impacts their confidence level as well as their effective problem-solving skills.

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Although many studies have investigated factors influencing students' mathematics performance, recent findings indicate that such studies often examine learner or teacher variables separately rather than in combination. A study by [4] found that students with consistently low mathematics self-efficacy performed poorly, underscoring the strong predictive power of psychosocial attributes for achievement. Similarly, [5] reported that differentiated instruction significantly improved learners' mathematics performance, demonstrating that teacher instructional attributes are crucially related to mathematics outcomes. On the other hand, [6] found that both self-efficacy and perceived teaching quality predicted motivation and persistence in mathematics. However, he treated these two as parallel rather than interactive influences. Although the abovementioned contributions are of great value, it is likewise evident that a research gap exists, as very few studies integrate learners' psychosocial attributes and teachers' instructional attributes to examine their combined predictive effect on mathematics performance. More specifically, this neglect of holistically framed interaction studies in the Philippine basic education context represents an important omission that this study would address.

2. Review of Related Literature

To provide direction and a frame of reference for this study, relevant literature and studies will be presented. It includes literature and studies that are directly or indirectly related to this study.

A. Psychological Attribute and Learning Performance

An in-depth analysis of recent literature demonstrates that psychosocial qualities play a critical role in mathematics learning. As documented by [7], specific affective qualities, such as attitudes towards math, goal setting, motivation, self-concept, self-efficacy, self-regulated learning, and study habits, have a profound effect on mathematical performance and achievement. These studies indicate that students' motivational and emotional inclinations play a crucial role in their involvement and success in mathematics.

In further support of this view, [8] demonstrates that attitudes and self-efficacy are strong predictors of mathematics performance among senior high school students. Their research shows that factors such as vicarious experiences with peers, perceived value of mathematics, anxiety levels, and vicarious experiences with adults all affect students' mathematical performance. Also, it highlights the need to create positive psychosocial environments and support systems to boost students' confidence and attitudes towards mathematics, thus enhancing their performance.

Consequently, the declining performance of students in mathematics is a long-standing issue in most education systems, with increasing focus on non-cognitive factors that could be contributing to this trend. As noted by [9], mathematics anxiety and the perceived value of technology were major predictors of students' mathematical performance, whereas students' engagement did not have a statistically significant impact. In another similar study, [10] found that students with higher mathematics self-efficacy tend to have lower anxiety, which is associated with better academic performance in mathematics. These results indicate that cognitive and affective variables, including self-esteem and anxiety management, are key determinants of students' achievement in mathematical courses.

Additional research supports the need to address psychosocial factors to improve mathematics performance. As indicated by [11], mathematics anxiety is a negative predictor of performance among elementary students, whereas self-efficacy is a positive predictor. [12] also established that psychosocial variables such as self-efficacy and anxiety significantly influence students' achievement in mathematics and recommended implementing educational interventions to promote psychological resilience and academic confidence.

B. Teachers' Instructional Characteristics

Students' perceptions of teachers' instructional styles significantly affect students' learning achievement in mathematics. In the Philippines, as reported by [13], students who perceived their teachers as knowledgeable and effective in their teaching showed higher interest and performance in mathematics. Likewise, a study by [14] found that students' agreement with their teachers' teaching techniques and classroom demeanor positively affected students' academic achievement. If students perceive that their teachers are capable and supportive, they are likely to be more motivated and engaged in learning. Conversely, negative attitudes can contribute to poor performance and lower confidence in mathematics. These results highlight the significance of teachers in shaping students' learning experience.

Globally, the same patterns have been evident across various educational contexts. In a study by [15], students who believed their teachers were highly knowledgeable about the subject they taught performed better in mathematics. They also documented that teachers' passion and commitment affected pupils' attitudes towards the subject. The findings support the idea of [16] in another research, which found that students' tendency to ask for help and enhance their mathematical proficiency was facilitated by teacher support. Students who are not afraid to ask questions have a better grasp of the math concepts. The research suggests that the teacher's style can have a significant impact on the students.

It has also been identified that teachers' instructional characteristics play an important role in shaping students' mathematics learning experiences and outcomes. Effective instructional practices, such as clear concept explanations, the use of varied teaching styles, and responsiveness to students' needs, are considered important factors for greater knowledge and academic success. It has also been identified that mathematics instructors with high-level mathematical skills and the ability to clearly explain concepts and promote better conceptual understanding among students, as identified by [17], are important. Similarly, as identified by [18] in their study, instructional methods with high levels of instructors' participation, formative assessment, and coordinated feedback are positively related to students' mathematics performance.

Apart from content delivery, other affective instructional

qualities, such as the teacher's excitement, the environment, and encouragement, also affect students' attitudes and engagement in mathematics education. This result is reinforced by the study conducted by [19], which indicated that for children to learn better, the teacher should be excited about the subject matter, and the environment should be conducive to students engaging well in the learning process. In a similar study by [20], the authors emphasized the importance of supportive instructional practices and strong student-teacher relationships in reducing students' fear of mathematics and increasing motivation.

C. Students' Performance in Mathematics

Students' math performance is shaped by numerous factors, both globally and in the Philippine context. One major problem linked to low performance is the global learning crisis, characterized by students advancing through education without acquiring critical math skills [21]. For example, in Kenya, Tanzania, and Uganda, 75% of third-grade students are unable to read a simple sentence, reflecting underlying learning deficits that include mathematics. Likewise, in Nigeria, 53% of 10-year-olds cannot read or write, further complicating the development of numeracy [22]. Such results highlight the imperative for systemic reforms in global mathematics education.

Globally, the quality of instruction and teaching pedagogy has been identified as a critical factor affecting students' performance in mathematics. For example, [23] argued that effective teaching methods aimed at improving student understanding of mathematics have a great impact on student performance. Similarly, [24] argued that incorporating problem-solving skills into mathematics instruction increases students' interest in mathematics. These findings suggest that teacher training programs should focus on effective teaching methods to maximize learning.

In the Philippines, socio-economic determinants shape students' math performance. Accordingly, [25] reported that family income and parents' educational attainment contribute significantly to students' math performance. Students belonging to more affluent families with better-educated parents outperform their less privileged peers, reflecting the effects of socio-economic inequality on school outcomes. Additionally, [26] found that cultural beliefs and attitudes towards mathematics affect students' motivation and performance. The study also highlights the need for culturally responsive teaching strategies in addressing these challenges in student learning outcomes.

Moreover, instructional language has been extensively researched regarding its impact on students' achievement in mathematics. The study by [27] found that students who learned mathematics in their mother tongue in their early years of schooling demonstrated better comprehension and problem-solving skills than those who learned it in a second language. This finding aligns with the Department of Education's policy on Mother Tongue-Based Multilingual Education, which aims to enhance students' learning outcomes by utilizing their mother tongues [28]. Literature agrees that language plays a significant role in teaching mathematics, especially in multilingual societies like the Philippines.

Furthermore, psychological aspects, including mathematics anxiety and self-efficacy, play a critical role in affecting students' performance both internationally and in the Philippines. As reported by [29], high mathematics anxiety has a negative impact on students' working memory, resulting in decreased performance. On the contrary, [30] found that higher self-efficacy beliefs in mathematics among Filipino students predicted taking on challenging tasks and persisting in difficult situations, ultimately leading to better academic performance. These studies are significant in highlighting the need to prioritize students' psychological well-being in mathematics education through supportive learning environments and confidence-building techniques.

On the other hand, students' performance in mathematics in North Cotabato is affected by both the instructional characteristics of the teacher and the psychosocial characteristics of the students. A study conducted by [31] in Maguindanao Division concluded that the professional and personal characteristics of the teachers were very satisfactory but did not strongly influence the academic performance of students in mathematics. The teaching strategies and management may not be efficiently translated into the students' performance. Moreover, [32] revealed that, although the students had a positive attitude and an excellent home environment, their performance in mathematics remained poor. The study revealed that students' attitudes, particularly their value of mathematics and self-efficacy, were good predictors of students' performance.

3. Theoretical Framework

This research was founded on [33] Social Cognitive Theory (1986), which provided a holistic understanding of human learning as an interplay among personal, action, and environmental factors. Bandura believed that learning is not only an experience-based event but is also an event of observation, imitation, and introspection. This framework is anchored in the concept of self-efficacy, an individual's belief in their ability to accomplish tasks. Psychological factors, such as self-efficacy, motivation, and anxiety, directly affect learners' learning outcomes. Bandura also focused on the role of environmental factors, such as learning approaches and teacher support, in shaping learners' learning outcomes. The teacher plays an important role in creating a pleasant learning environment by being supportive and effective, which helps learners become confident and motivated. Both factors are important for success, especially in learning challenging subjects such as mathematics.

Social Cognitive Theory applies to this research, as it offers a comprehensive account of the dynamic, reciprocal relationship between students' psychosocial factors and teachers' instructional features. The student's perception of teachers' instructional tactics depends on their psychosocial factors. The instructional quality, characterized by clarity, engagement, feedback, and emotional support, on the other hand, influences learners' psychological states, creating a continuous cycle of influence. For instance, effective teaching

strategies that meet learners' emotional needs while also providing clear explanations can reduce arithmetic fear and enhance motivation, helping learners grasp complex concepts more easily. The complex relationship between the two variables suggests that to enhance learners' arithmetic performance, psychosocial and instructional factors must be targeted simultaneously.

In addition, the interplay between psychosocial and instructional factors influences learners' arithmetic performance through continuous interactions among personal, environmental, and behavioral factors. The learners have personal factors that influence their behavior in relation to arithmetic learning situations. The teachers, through their instructional strategies, create a learning environment that can facilitate or hinder the learners' personal factors. The learning environment, through its interaction with the learners' personal factors, influences their engagement in arithmetic. The dynamic relationship between the two variables suggests that learners' arithmetic performance depends on the extent to which their learning environment aligns with their personal factors.

4. Statement of the Problem

The main objective of this study was to determine the significant relationship and impact of learners' psychosocial attributes and teachers' instructional characteristics on students' performance in mathematics among selected public secondary junior high schools in New Bataan District, Davao de Oro, SY 2025-2026. Specifically, this study aimed to find answers to the following questions:

1. What is the level of psychosocial attributes as perceived by the respondents in terms of:
   1.1 Academic Self-Efficacy,
   1.2 Academic motivation,
   1.3 Locus of Control,
   1.4 Mathematics Anxiety, and
   1.5 Peer Influence?
2. What is the level of teachers' instructional characteristics of teachers as perceived by the respondents in terms of:
   2.1 Knowledge of mathematics content,
   2.2 Communication ability,
   2.3 Use of appropriate strategies, and
   2.4 Classroom management skills?
3. What is the level of students' performance in mathematics in terms of their test scores?
4. Is there a significant relationship between psychosocial attributes and the performance of students in mathematics?
5. Is there a significant relationship between instructional characteristics of teachers and the performance of students in mathematics?
6. Can the domains of psychosocial attributes significantly predict the performance of students in mathematics?
7. Can the domains of instructional characteristics of teachers significantly predict the performance of students in mathematics?

5. Research Methods

This study employed a quantitative research design to measure and examine relationships among variables, specifically a descriptive-correlational design. [34] define quantitative research as the systematic collection and analysis of numerical data to identify patterns, correlations, and trends. The descriptive component was used to portray the situation at the time of the investigation and to explain the phenomenon. [35] describes descriptive research as the study of individual events and situations in their natural context. Additionally, the study employed a correlational research design, specifically predictive correlational research, which [36] defines as examining the statistical relationships between variables to predict outcomes.

In this research study, Andap National High School, Bantacan National High School, Camanlanagan National High School, Cogonon Integrated School, Magangit Integrated School, Pongpong Integrated School, and Tandawan Integrated School, public secondary and integrated schools located in New Bataan, Davao de Oro, were selected as the sites of interest.

Additionally, 166 Grade 9 students from six selected secondary schools located within the New Bataan District, namely Andap National High School, Bantacan National High School, Camanlangan National High School, Cogonon Integrated School, Magangit Integrated School, and Tandawan Integrated School, were used as respondents for this research during the school year 2025-2026.

Stratified random sampling was used to improve representativeness. The strata were formed by using six selected schools. As emphasized by [37], stratified random sampling is a good approach for obtaining a representative sample of the groups. It improves the accuracy and reliability of the data. To determine the exact number of samples to be used for this research, this researcher consulted the Raosoft sample size calculator to obtain a 95% confidence level and a 5% margin of error. The total number of respondents was computed to be 166, given a total population of 423 Grade 9 students.

Moreover, the data on learners' psychosocial attributes and teachers' instructional characteristics were collected using two sets of adapted and modified questionnaires. The first part focused on the Psychosocial Attributes Questionnaire developed by [38], which was used to gather data on five indicators: academic self-efficacy, academic motivation, locus of control, mathematics anxiety, and peer influence. The second part covered the Instructional Characteristics Questionnaire by [15], which comprised four dimensions: knowledge of mathematics content, communication ability, use of appropriate teaching strategies, and classroom management skills. All items in the two questionnaires were rated on a four-point Likert scale: 4 – Strongly Agree, 3 – Agree, 2 – Disagree, and 1 – Strongly Disagree to determine respondents' level of agreement with each statement. Meanwhile, the third part of the data collection involved collecting the first-quarter Mathematics examination scores of Grades 9 learners to assess their academic performance.

6. Results and Discussions

A. Level of Learners' Psychosocial Attributes

Table 1 depicted the results of the summary level of learners' psychosocial attributes based on the identified indicators, namely academic self-efficacy, academic motivation, locus of control, mathematics anxiety, and peer influence.

Results demonstrated that psychosocial attributes such as academic motivation, locus of control, math anxiety, academic self-efficacy, and peer influence were all agreed and manifested by the learners which suggest that students typically exhibit these traits at a moderate level. This indicates that although students have a reasonable level of self-assurance, drive, and self-control, they also occasionally feel anxious and are influenced by their peers to some extent. According to one interpretation of this result, students can control their feelings and actions when learning mathematics, but they still require assistance to develop their positive psychosocial traits. The implication for educators is to create instructional strategies that minimize anxiety and foster positive peer interactions while increasing students' motivation and sense of self-efficacy.

Table 1
Summary level of learners' psychosocial attributes

Indicators	Mean	Descriptive Equivalent
Academic Self-Efficacy	2.86	Agree
Academic Motivation	3.13	Agree
Locus of Control	3.10	Agree
Mathematics Anxiety	2.95	Agree
Peer Influence	2.99	Agree
Overall Mean	**3.01**	**Agree**

This supports the idea of [39], students who are more motivated and believe in themselves are more likely to employ self-regulated learning techniques, stay resilient, and perform better. Similarly, locus of control is important: students who believe they have control over their success (internal locus) are more accomplished and persistent than those who blame performance on outside forces. An internal locus of control combined with high self-efficacy has been shown to significantly improve students' academic outcomes through its influence on motivation and learning engagement [40].

Furthermore, peer pressure and moderate math anxiety are indicators of both opportunities and difficulties in the classroom. Math anxiety is still prevalent among students, according to [41]. On the other hand, supportive peer relationships can lessen anxiety and promote positive attitudes toward learning mathematics. Thus, the "often observed" level of these psychosocial attributes indicates that although students have the fundamental traits necessary for academic success, they still need organized interventions to bolster them even more. To turn these moderate psychosocial levels into more powerful facilitators of mathematical achievement and long-term academic growth, educators and educational institutions should create learning environments that are collaborative, anxiety-reducing, and motivating.

B. Level of Teachers' Instructional Characteristics

Table 2 presented the results of the summary level of Instructional Characteristics based on the identified indicators, namely knowledge of mathematics content, communication abilities, use of appropriate teaching strategies, and classroom management skills.

The findings also showed that the general degree of instructional characteristics were all agreed and manifested by learners, as evidenced by teachers' communication skills, use of suitable teaching strategies, classroom management abilities, and content knowledge of mathematics. This indicates that teachers typically exhibit proficiency in these crucial areas of instruction, which empowers them to effectively present lessons and create a supportive learning environment. According to the findings, most teachers effectively manage classrooms, apply appropriate teaching strategies, communicate concepts clearly, and have a sufficient level of content mastery. Although these strengths are apparent, the "often observed" rating suggests that they are not yet constant across all teaching contexts. Therefore, it is recommended that reflective teaching practices, peer collaboration, and ongoing professional development be used to further improve these instructional traits and guarantee long-term gains in student learning and teaching quality.

Table 2
Summary level of teachers' instructional characteristics

Indicators	Mean	Descriptive Equivalent
Knowledge of Mathematics Content	3.13	Agree
Communication Abilities	3.20	Agree
Use of Appropriate Teaching Strategies	3.11	Agree
Classroom Management Skills	3.24	Agree
Overall Mean	**3.24**	**Agree**

The findings support the claims which point out that teachers' instructional characteristics have a significant impact on students' learning mathematics experiences and outcomes. Successful instruction practices, such as clarity of explanation, the use of different teaching styles, and student need responsiveness, are important variables in greater knowledge and academic accomplishment. [17] argue that mathematics teachers who have excellent mathematical expertise and can clearly convey content encourage better conceptual understanding in students. Similarly, [18] discovered that teaching techniques involving high levels of instructor participation, formative assessment, and coordinated feedback are favorably associated with student mathematical performance. These data suggest that how teachers deliver, and coordinate mathematics teaching has a direct impact on students' achievement in the subject.

Aside from content delivery, affective instructional characteristics such as teacher excitement, classroom environment, and encouragement all have an impact on students' attitudes and involvement in mathematics education. [19] found that children learn better when their teachers are passionate and create a good classroom climate that encourages engagement and risk-taking. In a comparable study, [20] emphasized the importance of supportive instruction and excellent teacher-student connections in reducing math fear and increasing motivation. These studies highlight the importance of both cognitive and affective components of instruction,

demonstrating that excellent mathematics teaching requires not only material mastery but also the ability to interest and motivate students.

Furthermore, [42] found that the efficacy of the instruction, the teacher's personal efficacy, the quality of the teacher, and the motivation of both the teacher and the students all had an impact on the mathematical accomplishment of the students. Peer-assisted learning, classroom management, topic knowledge, student views, and parental interest all have an impact on students' achievement, claim [43]. According to research by [44] teacher attitude, teacher quality, motivation, self-efficacy, cooperative learning, and teacher-student relationships all affect students' math performance.

C. Level of Students' Performance in Mathematics

Table 3 demonstrated the results of the level of students' performance in mathematics. The level of students' performance in mathematics was described as nearly proficient, indicating that students have developed fundamental knowledge and skills and a core understanding, and can transfer them through authentic tasks with little teacher guidance and some assistance from peers.

This level of performance demonstrates to students that they have a firm grasp of fundamental math concepts and can apply them to real-life situations with minimal support. This ability to handle real-life problems and tasks is a clear indication that they are beginning to work independently. However, they still require some support and the opportunity to learn in a group setting. The learning environment at this level clearly indicates that students have a firm grasp of foundational math concepts. However, they still need further strengthening to reach a level of mastery and confidence. It means that the students' math understanding and performance can be improved by providing scaffolding, increasing the level of difficulty, and peer collaboration.

Table 3
Level of students' performance in mathematics

MPS	Frequency	Percentage	Level of Proficiency
90 – 100	10	6	Highly Proficient
75 – 89	29	17.5	Proficient
50 – 74	63	38	Nearly Proficient
25 – 49	58	34.9	Low Proficient
0 – 24	6	3.6	Not Proficient
Total	**166**	**100.00**	
	MPS: 55.73		**Nearly Proficient**

Several research findings support the profile of learners who are nearly proficient in mathematics, indicating that such learners usually have sound foundational knowledge and can already apply concepts with limited guidance. It has also been emphasized in studies that attitudes, study habits, and interest in the subject are strong predictors of learners' performance in mathematics [45], [46], reflecting the profile of learners who can already engage in authentic tasks, but who can benefit from occasional support. [47] further identified continuous mathematical exposure as resulting in enhanced competence, as evidenced by higher accuracy in task engagement, thus supporting the notion that continuous exposure enhances competence. Relatedly, [48] found that learners with stronger analytical thinking and reasoning competencies demonstrate higher levels of mathematical competence. This assertion was also reiterated by [49], thus strengthening the interpretation that learners at this level are developing their higher-order thinking.

This study's results are further reflected in the findings of [50], who estimated high academic performance for learners with strong learning engagement and continuous support systems. In this context, the ability to attain a level of "very satisfactory," or almost proficient, is not just about students' ability but also their attitude towards learning, support from their backgrounds, and their ability to work with their parents and teachers. Similarly, [51] note that attending school has little effect on the performance of the students, which implies that there are more underlying factors, such as the quality of education, support from home, and meaningful experiences, which are more important to the students' math achievement. All these studies, therefore, indicate that as students are encouraged to build on their prior knowledge and skills, they also need support, organization, and experience with "real-world math problems" to increase their confidence and proficiency.

On the other hand, [52] emphasized that "low math skills can cause anxiety," indicating a need to further solidify students' fundamental skills to progress from near proficiency to full mastery. Moreover, other studies have emphasized that "the absence of important knowledge and a solid grasp of basic knowledge in mathematics can directly affect students' academic performance negatively." [53], for instance, revealed that "students who did not master basic numeracy and arithmetic skills were unable to master more advanced mathematical concepts, which negatively impacted their performance in secondary math." Moreover, [54] revealed that "Filipino students' weak fundamental skills in number sense and problem-solving skills prevented them from advancing to more challenging content."

Several studies increasingly highlight the roles that both thought processes and emotions play in how well students grasp fundamental math skills. For instance, [55] suggest that while math anxiety and academic self-efficacy can negatively impact performance by reducing engagement and limiting the ability to grasp fundamental math skills, it is also important to note that [56] suggest that a lack of motivation and academic self-confidence can cause difficulties when it comes to retaining fundamental knowledge that is required to grasp new concepts.

[57] argued that the lack of performance in math is not solely the fault of the absence of prerequisites or the role of emotions. By using the PISA results from various countries, the authors demonstrated that there are indeed external factors such as teacher competence, teaching methods, the learning environment, and the student's SES that significantly affect the student's performance in math. The rationale behind their argument is that if changes are made on a larger scale, such as improvements in the availability of learning tools and the quality of the learning environment, even if the student has limited prior knowledge, the results would improve significantly.

D. Relationship between Learners' Psychosocial Attributes and Students' Performance in Mathematics

Table 4 presented the results of the relationship between psychosocial attributes and students' performance in mathematics. The results further indicate that learners' psychosocial attributes had a mean score of M = 3.05 (SD = 0.21), suggesting that respondents generally demonstrated favorable psychosocial characteristics. In contrast, students' performance in Mathematics obtained a mean score of M = 22.21 (SD = 8.21), reflecting moderate achievement with considerable variability in scores. However, the Pearson product–moment correlation revealed a very weak positive relationship between psychosocial attributes and Mathematics performance, r = .053, p = .501 greater than the .05 level of significance, the relationship was not statistically significant. This implies that learners' psychosocial attributes were not significantly associated with their Mathematics performance in this study, and therefore, the null hypothesis was not rejected.

Table 4
Relationship between learners' psychosocial attributes and students' performance in mathematics

Descriptive Statistics	Psychosocial Attributes	Performance of Students in Mathematics
Mean	3.05	22.21
Standard Deviation	.21	8.21
Pearson's r	**.053**	
p-value	**.501**	

The research results confirm the idea proposed by [55]. Accordingly, although psychosocial attributes are related to learning behavior, their direct relationships with academic achievement, especially in mathematics, may be weak or context dependent. In their study, they described how math anxiety and self-efficacy influence students' engagement and emotional disposition toward mathematics, yet the increases in math achievement scores were not always significant when cognitive and instructional variables were considered. Similarly, [58] found that while motivation and self-efficacy foster higher satisfaction and engagement, their impact on measurable learning outcomes diminishes when effective instructional design and skill mastery are low. Results further show that psychosocial factors alone are insufficient to explain variations in math performance. Hence, it is important to combine effective motivational strategies with evidence-based teaching strategies.

More evidence supports the proposition that external factors and instructional factors are stronger predictors of student performance in math than psychosocial factors. [57] conducted a study using PISA data. They concluded that the relationships between student performance in math and teacher competence, teaching practices, and socioeconomic context are stronger than those between student performance and psychosocial factors. Another study by [59] concluded that emotions such as anxiety, motivation, and confidence influence student performance in math. However, this influence is minimal and statistically insignificant when cognitive and instructional factors are considered. Moreover, it shows that although psychosocial factors are important, they cannot be relied upon to predict math performance, and that comprehensive interventions that address all factors are essential if performance is to be improved significantly and measurably.

E. Relationship between Teachers' Instructional Characteristics and Students' Performance in Mathematics

Table 5 showed the results of the relationship between teachers' instructional characteristics and students' performance in mathematics. The results show that teachers' instructional characteristics obtained a mean score of $M = 3.21$ ($SD = 0.42$), indicating that respondents generally perceived instructional practices to be favorable. Meanwhile, students' performance in Mathematics had a mean of $M = 22.21$ ($SD = 8.21$), reflecting moderate achievement with considerable variability in scores. The Pearson product–moment correlation analysis revealed a very weak positive relationship between teachers' instructional characteristics and students' Mathematics performance, $r = .039$, $p = .614$. Since the p-value is greater than the .05 level of significance, the relationship is not statistically significant. This finding suggests that teachers' instructional characteristics were not significantly associated with students' Mathematics performance in this study, and thus, the null hypothesis was not rejected.

Table 5
Relationship between teachers' instructional characteristics and students' performance in mathematics

Descriptive Statistics	Instructional Characteristics	Performance of Students in Mathematics
Mean	3.21	22.21
Standard Deviation	.42	8.21
Pearson's r	**.039**	
p-value	**.614**	

The findings also align with several studies that underscore the quality and alignment of instructional characteristics with students' mathematics learning outcomes. [32] found that mathematics performance could not be significantly predicted by teachers' classroom management, students' attitudes, and home environment; thus, instructional characteristics alone may not fully explain learners' achievement in mathematics. In China, the role of individual characteristics of teachers that influenced student cognitive performances, as revealed by the [60], included aspects associated with homeroom teachers, such as experience and management roles, but not subject-related teaching roles, as these did not have any effect on student scores. Likewise, [61] have commented that the effectiveness of instruction is not essentially a function of the teaching method per se but rather of how it involves students in the meaningful processes of problem-solving, reasoning, and reflection. These studies suggest that when instructional strategies do not consider the purposeful design or match learners' cognitive and developmental stages, the effects on performance may become negligible, as observed in the current study.

In agreement with that, [62] noted that while instructional quality and teacher competence are identified as significant predictors of academic achievement, their benefits can be weakened when teachers lack pedagogical flexibility or the

ability to adapt the method to diverse learners. On the same note [63], in presenting the TIMSS 2019 findings, indicated that effective instruction is related to student achievement when clear lesson structure, feedback, and adaptive teaching are combined. The result implies that while teaching methods play a vital role in the learning process, their impact depends on how well they align with the learning setting. The research indicates that unless teaching methods are well aligned with students' needs, their impact on students' math achievement would be minimal or imperceptible.

On the other hand, other studies have shown that the impact of teaching methods on students' math achievement is limited because these methods do not entirely account for differences in students' math performance. According to the [1], other studies have shown that students' socio-economic status, the availability of school resources, and students' self-regulation skills have a greater impact on students' math performance than the teaching methods used. The results were also supported by [64] findings, which showed that students' motivation, parental support, and psychological involvement have a greater impact on students' math performance than the teaching methods used. This further supports the assertion that teaching methods play a vital role in providing quality education, and their impact should be considered alongside other factors.

F. Regression Analysis of Learners' Psychosocial Attributes and Students' Performance in Mathematics

Table 6 presented the results of the regression analysis on how psychosocial attributes, such as academic self-efficacy, academic motivation, locus of control, mathematics anxiety, and peer influence, relate to the performance of students in mathematics. The R-squared value is .037, indicating that only 3.7% of the variation in students' performance is explained by these factors. Generally, the model was not significant, F = 1.22, p = .300, indicating that psychosocial attributes do not significantly predict mathematics performance. Of all the predictors, only academic self-efficacy approached significance, B = 3.371, t = 1.976, p =.050, suggesting that students who are confident in their academic abilities tend to perform slightly better in mathematics. On the other hand, academic motivation, locus of control, mathematics anxiety, and peer influence were found to have negligible effects on students' mathematics performance in this study. Thus, the null hypothesis that psychosocial attributes do not have a domain that significantly predicts students' performance in mathematics, is rejected.

The results showed that of the five psychosocial attributes, such as academic self-efficacy, academic motivation, locus of control, mathematics anxiety, and peer influence, only academic self-efficacy significantly predicts the performance of students in mathematics. This supports the notion that a student's belief in their capability to do mathematics is an important precursor to their performance. Students with higher levels of self-efficacy are more likely to persist in tackling challenging mathematical problems, using effective strategies, and avoid deterioration in the face of setbacks. Correspondingly, students who display lower levels of self-efficacy are increasingly likely to show avoidance, anxiety, and learned helplessness despite motivational capability or peer pressure, leading to poorer performances. Academic self-efficacy plays the role of mediator, with performance directly influenced by confidence in one's ability, leading to greater effort, focus, and perseverance in mathematical learning.

Numerous studies confirm that academic self-efficacy is a potent predictor of student success in mathematics and other subjects. According to [39], self-efficacy not only influences the type of task students prefer to accomplish but also the level of work and the length of time they persist in the task, thereby controlling academic outcomes through motivation and thoughts. According to [65], when students have self-efficacy, they have higher aspirations and better problem-solving skills, including complex math problems. This discussion of the studies implies that academic self-efficacy not only predicts academic success; it also influences other psychosocial factors, making it a vital construct in academic achievement.

Following this line of reasoning, [66] demonstrates that students with high self-efficacy exhibit self-regulated learning, which influences their academic performance. In a study by [67], math self-efficacy is closely associated with adaptive behaviors, including persistence, active involvement, rapid recovery, and the use of a variety of strategies, as well as perceptions of the sources of success and failure. In a study by [68], academic self-efficacy is a powerful predictor of academic success in mathematics. This implies that academic self-efficacy is a powerful and consistent predictor of academic success in mathematics compared to other psychosocial attributes.

Table 6
Relationship between learners' psychosocial attributes and students' performance in mathematics

Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients Beta**	**T**	**Sig.**
	B	**Std. Error**			
(Constant)	10.681	8.036		1.329	.186
Academic Self-Efficacy	3.371	1.706	.169	1.976	.050
Academic Motivation	-1.614	1.631	-.082	-.990	.324
Locus of Control	.106	1.808	.005	.059	.953
Mathematics Anxiety	1.422	1.438	.082	.989	.324
Peer Influence	.632	1.776	.030	.356	.723

R^2 = .037
F = 1.22
p-value = .300
Dependent Variable: **Students' Performance in Mathematics**

Table 7
Relationship between teachers' instructional characteristics and students' performance in mathematic

Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients Beta**	**T**	**Sig.**
	B	**Std. Error**			
(Constant)	22.742	6.630		3.430	.001
Knowledge of Mathematics Content	1.033	1.723	.059	.600	.550
Communication Ability	-.022	1.926	-.001	-.012	.991
Use of Appropriate Teaching Strategies	.553	1.944	.024	.284	.776
Classroom Management Skills	-1.685	1.728	-.094	-.975	.331
R^2 = .008					
F = 3.11					
p-value = .870					
Dependent Variable: **Students' Performance in Mathematics**					

G. Regression Analysis of Teachers' Instructional Characteristics and Students' Performance in Mathematic

Table 7 presents the results of a regression analysis investigating the effects of instructional characteristics on students' mathematics performance, including knowledge of mathematics content, communication ability, use of appropriate teaching strategies, and classroom management skills. The R-squared was .008, showing that only 0.8% of the variance in students' mathematics performance can be explained by these instructional factors. The overall model was not significant F = 3.11, p = .870). The results indicate that, together, the instructional factors have little ability to predict students' performance. None of the predictors contributed significantly individually, as all p-values were above the .05 threshold. These results show that while instructional factors are crucial to teaching quality, they do not make a significant difference in students' mathematics performance, possibly because other external or learner-related variables may be playing an overriding role. As a result, the null hypothesis that instructional characteristics do not have a significant domain for predicting students' performance in mathematics is accepted.

Regression analyses of instructional characteristics and the performance of students in mathematics showed that none of the domains, including knowledge of mathematics content, communication ability, the use of appropriate teaching strategies, and classroom management skills, significantly predicted students' performances. This result might indicate that, while these instructional characteristics are critical to effective teaching, they may not readily translate into measurable differences in students' academic outcomes. One possible reason is that, in addition to teachers' instructional traits, student performance in mathematics may be determined by other factors, such as learners' attitudes and motivation, the learning environment, socio-economic background, or the availability of learning resources.

The outcome is consistent with [69] conclusion that there is not a single teaching strategy that works in every circumstance. Therefore, to improve students' performance in mathematics, teachers may need to adapt their pedagogy to fit their situations and involve all students in the learning process. Additionally, [70] supported this claim by using a qualitative approach grounded in theory and a systematic design to examine the relationship between teaching methodology and students' academic performance among Senior High School students in Bono East. He discovered that differences in students' academic performance within the district were explained by teachers' teaching experience, qualifications, and pedagogical approach. Also, when [71] investigated the reasons for the subpar performance of Senior High School pupils in Dare Salam, they found a strong correlation between the teaching approach and students' academic achievement. In both teaching and learning, instructional strategies are crucial. People have varying cognitive capacities and mathematical backgrounds, given the complexity of the classroom. Educators must embrace approaches that consider these distinctions.

However, other studies found that students' success in mathematics was significantly correlated with teachers' instructional features. When [72] examined the factors related to teachers that influence students' academic success in mathematics in the Ashanti Region, they found a strong correlation between students' academic performance and teachers' qualifications. This result is like that of [73], who found a substantial association between students' performance in elective mathematics and teachers' qualifications in a quantitative examination of the predictive determinants of students' performance in mathematics. Without question, a math teacher's qualifications are crucial to the teaching and learning process. Thus, to effectively and comfortably teach mathematics to all students, regardless of their cognitive characteristics, the instructor must possess both professional and academic credentials.

Furthermore, the quality of teaching and learning is greatly influenced by teachers' academic and professional credentials, and the quality of teaching and learning, in turn, influences students' performance. Therefore, to improve students' arithmetic performance, schools need to hire math teachers with the necessary academic and professional credentials. However, in a qualitative study of teacher-related aspects of students' performance in the Ahafo region, [74] found that teachers without professional qualifications produced the same, or even better, outputs as professional teachers.

7. Conclusions and Recommendations

This study sought to ascertain the levels of students' psychosocial attributes, teachers' instructional characteristics, and students' performance in mathematics. It also sought to investigate the important correlations and predictive influence between these variables and mathematics performance. The findings revealed that students agreed and manifested on all

aspects of their psychosocial attributes, including academic self-efficacy, motivation, sense of control, mathematics anxiety, and peer influence. Also, the students also agreed and often observed on all aspects of the teachers' instructional characteristics, including students' perceptions of teachers' knowledge of mathematics content, communication skills, use of appropriate teaching strategies, and classroom management. The students performed nearly proficiently in mathematics. This indicated a solid grasp of the basics of mathematics.

Despite the study's positive findings, it failed to establish significant relationships between psychosocial attributes and mathematics performance, and between instructional characteristics and performance. Academic self-efficacy was found to be the sole predictor of mathematics performance among the psychosocial attributes' domains. Moreover, this study is important for highlighting the significance of students' confidence in their own ability and for showing that other factors may be more influential in mathematics performance. Thus, these findings emphasize the need for more targeted, intensive, and research-based instructional interventions that focus not only on what students observe but also on the quality, depth, and consistency of instructional delivery.

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