Students' Basic Math Skills and Study Habits in Relation to Their Performance in Mathematics

[1]Joalse Christy S. Gumapac, [2]Jaycee C. Yulo,
[3]May Noren D. Nanud, [4]Genelyn R. Baluyos
[1]College of Education
[1]Misamis University, Ozamiz City, Philippines
[1]joalsechristy3@gmail.com, [2]jhaycee.yulo16@gmail.com

***Abstract*— The students' basic mathematics skills and study habits play a crucial role in shaping their learning and performance in mathematics. This study explored the basic math skills and study habits of students in relation to their performance in Mathematics. An online survey form was randomly distributed to 121 secondary students. The researchers adopted the descriptive-correlational research design and utilized the Students' Basic Mathematics Skills Questionnaire, Students' Study Habits Questionnaire, and students' records of grades as instruments. The statistical tools that the study used are Mean, Standard Deviation, Frequency, Percentage, Pearson Product-Moment Correlation Coefficient, and Stepwise Multiple Regression Analysis. The outcomes show that the pupils performed very well in Mathematics throughout all themes, especially strengths in presenting and communicating; study skills were also very strong in motivational attitude, proper note-making, and pre-testing readiness. Overall, mathematics performance is generally satisfactory except for considerable associations between achievement and capabilities in knowledge and comprehension, estimation, and computation. However, no significant relationship was found between study habits and performance except for the fact that knowing and understanding, as well as estimating and computing skills, have a significant impact on their mathematics performance. The study concludes that students' proficiency in basic math skills, especially in understanding, estimating, and computing, significantly influences their mathematics performance, whereas their study habits do not have a significant impact. It is highly recommended that educators first lay the foundational skills of the student in mathematics understanding, estimation, and computation since these are high-impact areas for students' performance in mathematics. More importantly, although good study habits are crucial, more emphasis should be given to critical math skills than to merely achieve better academic results. Further research is required to ascertain what kinds of instructional strategies most effectively boost students' basic math abilities and monitor the persistence of their impacts on mathematics achievement.**

***Index Terms*— academic achievement, basic math skills, study habits, mathematics performance**

I. INTRODUCTION

Mathematics is one of the central subjects that a student learns at the secondary stage, but it is essential for academic progress as well as for cognitive and problem-solving skills for surviving in this world. (Arisoy & Aybek, 2021). Mathematics is one of the core subjects of secondary education. At the secondary stage, many modern concepts and methods are introduced into the mathematics syllabus (Kumar et al., 2024). However, despite the significance of mathematics achievement by students, this achievement has been declining. So, educators are worried about this trend. Among the reasons why student achievement in mathematics has been declining in schools is that students view mathematics as a difficult and boring subject (Hadi et al., 2018). These challenges manifest in different ways, including low academic performance, loss of confidence, and lack of engagement with mathematical content. Mathematics may be perceived to be a difficult and boring subject, which makes students feel disconnected and lose confidence. Therefore, students who feel less confident or who are failing in math may not pursue some fields that require very strong mathematical fundamentals (Acharya, 2017). Moreover, Math student achievements have not been good enough (Arsenault et al., 2023).

Proficiency in basic mathematical concepts and skills is a good indicator of students' overall academic achievements, especially in the fields of science, technology, engineering, and mathematics (STEM) (Hajovsky et al., 2019). Thinking about various basic numerical skills makes it possible to assess their particular predictive power in terms of further mathematical achievement, as well as basic mathematical learning failure (Hirsch et al., 2018). Of course, one of the key aspects of the conditions determining a student's success is his or her academic success. It also has a huge impact on education, mainly as a practical tool to assess how students are learning (Tus, 2020). Education is the act of fostering an individual's abilities and potential to succeed in a given society or cultural environment. As we all know, education is primarily focused on individual development. The student's academic performance in mathematics is an important determinant of their overall educational success and can significantly influence their choices in the future for academics and careers. Thus, improving academic outcomes and fostering the personal growth and development of every student requires an approach to the challenges that exist within mathematics education.

Understanding the factors that influence students' performance in mathematics is of the greatest importance to educators. The importance of studying students' basic knowledge in mathematics is to explore the level of attitude toward problem-solving and mathematics achievement among students (Akhter & Akhter, 2018). Also, it shows that there is a significant relationship between the students' knowledge and willingness to learn (basic knowledge and skills and study habits) and their performance in mathematics, which plays a very significant role in education, primarily as a concrete tool to assess the students' learning process (Tus, 2020). Mathematics proficiency is closely linked with academic success but is also highly responsible for shaping future career prospects and contributions to the betterment of society (Piesch, 2020). Remediation of the root problems in mathematical learning for students has become essential in fostering the skills needed to confront a more quantitatively orientated world (Mazana et al., 2019).

Some other previous research has worked on different aspects of mathematics education, including learning mathematics by students in connection with teaching methods and personal differences (Baran et al., 2019). Other studies have focused on identifying influences in terms of socioeconomic factors, quality of teachers, and teaching resources on the performance of learners in mathematics (Peng et al., 2020). Although the literature on these areas is available, there is still a lacuna in understanding how these basic math skills and study habits interrelate in affecting students' performance in mathematics. The available evidence suggests that students' mastery of the fundamental mathematical concepts and competencies, as well as their study habits and self-regulation strategies, play a significant role in determining mathematics achievement (El-Adl & Alkharusi, 2020). For example, research has established that students' understanding of symbolic magnitude estimation, a core component of numerical cognition, predicts their overall mathematics performance (Graham & Was, 2021). In the same way, it has been established that factors such as study habits,

fear/anxiety, and parental involvement correlate with elementary and secondary students' mathematics and geometry proficiency (Flores, 2019).

Many studies have focused on the critical factors that contribute to student's performance in mathematics. In particular, their math skills and study habits have gained much attention. For instance, the researcher examined the characteristics most significantly associated with success in an introductory business statistics course and emphasized the critical role that basic math skills play in determining the overall academic performance of the students. Their findings also underscore how students with higher foundational math skills tend to achieve better grades (Kim et al.,2019).

In addition to mathematics skills, study habits have proven to be a pivotal aspect that influences mathematics performance. Self-regulation and active involvement in the learning process indicate that students with disciplined and consistent study habits often outperform others. In addition, techniques like spaced repetition and retrieval practice have been proven to be very effective in improving learning outcomes in mathematics, which further shows the impact of structured study habits on academic success (Svartdal et al., 2022).

Basic math skills, study habits, and other factors interact to affect mathematics performance (Tossavainen, 2020). Classroom management practices greatly affect students' learning experiences. The influence of classroom organization, teacher-student interactions, and instructional clarity on students' mathematical achievement was investigated, and an enabling learning environment was emphasized (Rabiya et al., 2017).

The attitude of a student towards mathematics is a powerful influencer in his mathematical career. Students' success depends upon their attitude toward mathematics (Andamon & Tan, 2018). It also influences the participation rate of learners—the influence of attitudes, beliefs, and perceived self-efficacy on mathematics performance. The author showed that students' attitudes are reciprocal and interconnected with the results of academic achievement. Positive attitudes toward math have been related to higher motivation, engagement, and, finally, improved performance in the subject (Dowker et al., 2019).

The home environment significantly influences students' mathematical development (Zippert & Rittle-Johnson, 2020). Some have studied the role of the home environment, availability of educational resources, and similar attitudes toward education in influencing students' mathematical skills and attitudes (Sitopu et al., 2024). A supportive home environment creates a positive attitude toward math, encourages practice, and reinforces learning, which contributes to improved mathematics performance.

The researcher identified an apparent knowledge gap in the prior research concerning the correlation between students' study habits and their overall performance in mathematics. In addition, the prior research did not address the subject of how the relationship between students' basic math skills and study habits specifically influences their performance in mathematics. This study encompasses several unexplored dimensions that have attracted research attention from other disciplines. The relationship between students' basic math skills and their study habits should be explored further to provide an understanding as to why such is not the case with their performance in mathematics (Miles, 2017).

The main objective of this research was to examine how students' basic math skills and study habits affect their academic achievement in mathematics at Misamis University during the school year 2023-2024. Understanding what factors influence students' performance in mathematics is crucial, especially in secondary schools, where foundational knowledge and effective study practices provide a foundation for future academic success.

Studies have continually shown that study habits have a significant role in students' academic performance. Studies have highlighted the fact that students who engage in disciplined and organized study routines tend to perform better in their academic subjects, including mathematics. However, despite this well-established relationship, it remains very important to explore how these findings apply within specific contexts like Misamis University and also consider the evolving challenges being faced by students today, whether it is changes in curriculum, technology use, or learning environments.

In order to dig up new insights from this school and period into how study habits and basic math skills influence student outcomes, the paper provides new insights reflecting the current climate and action strategies to make improvements in math instruction. The research assists educators and administrators at Misamis University in finding the right way to support their students and optimize teaching approaches toward improving their performance in mathematics.

This study is important because it informs teaching techniques, interventions, and support programs that have been modified to meet students' needs. The findings from this study can be used to inform the development of targeted activities aimed at enhancing the basic math skills and study habits of children, thereby enhancing their mathematical performance. Further, the study findings may be utilized to inform the development of mathematics curriculum as well as policies regarding education to provide an amiable learning environment, which promotes improved student performances in mathematics.

II. METHODS

Research Design

It utilized a descriptive-correlational designed quantitative study. In this case of the descriptive study, there was just a single sample without comparison at the study design; rather, these studies are typically carried out to describe how these elements of the sample have various characteristics in relation to some variables present (Omair, 2015). This study utilized quantitative approach is assessing the relationships between basic math skills, study habits, and performance in mathematics. Correlational studies attempt to establish whether variations exist in the attributes of a population based on whether its members have experienced a specific event of interest in a naturalistic setting (Lau, 2017). The descriptive-correlational design was appropriate for this study since it described the students' basic skills in mathematics and how students' study habits related to their performance in mathematics.

Research Setting

The research was carried out in the Basic Education Department of Misamis University. Misamis University is the leading educational institution in Ozamiz City, Misamis Occidental. It is the very first and only university in Mindanao certified by Det Norske Veritas, The Netherlands, for Quality Education and Service under ISO standards. Misamis University's priority is the students. Misamis University wishes to ensure that students acquire the information, resources, and support they require to be successful. The stature of Misamis University in the region continues to establish it as a top institution of learning. The university nurtures student competence through its creative processes of teaching and learning. Mathematics at levels K-10 is based on quantities, shapes, functions, logic, and reasoning. It is a scientific tool and a language with its symbols and rules, hence facilitating

the effective expression of concepts and ideas. The K to 10 Mathematics Curriculum lays a solid foundation for further studies in Grades 11 to 12. In addition, it equips Filipino learners with essential concepts and life skills that are important for their continued development as learners and as responsible citizens of the Philippines.

Research Respondents

The respondents of the study were 121 students at the Junior High School in Misamis University, Misamis Occidental, who were selected through a purposive sampling technique. Purposive sampling is a non-probability technique where researchers intentionally choose participants based on their relevance to the study. The choice is determined by characteristics, expertise, or experience that can offer meaningful perspectives on the research question, which is especially suitable for focused studies in mathematics (Thomas, 2022). The selection of the respondents was based on the following criteria: (1) students who were currently enrolled in a mathematics course at the Junior High School level; and (2) students who were willing to participate in the study. The researchers ensured that the mentioned criteria would be fulfilled before conducting the survey.

Research Instruments

The study used two questionnaires, the Students Basic Math Skills and Students Study Habits, as data-gathering instruments.

A. Students Basic Math Skills Questionnaire (Appendix A). This questionnaire was researcher-made. However, before using these questionnaires officially, the researcher made sure to conduct pilot testing for their validity. In conducting pilot testing, ten percent (10%) of the respondents were tested to check the validity of the questionnaires, as the value of Cronbach's alpha surpasses the needed value to be accepted, which is 0.7. Cronbach's alpha = 0.88.

The items were constructed using a 4-point Likert scale format, and the students responded to the statements on a scale ranging from always (4), often (3), sometimes (2), to never (1). The instrument contains 30 items with six constructs, namely, Knowing and Understanding (5 items), Estimating, Computing and Solving (5 items), Visualizing and Modelling (5 items), Representing and Communicating (5 items), Conjecturing, Reasoning, Proving and Decision-Making (5 items), and Applying and Connecting (5 items). The items were relevant to this study since they emphasized students' basic math skills.

In determining the basic math skills, the following scale was used:

Responses	Continuum	Interpretation
4- Always	3.25-4.0	Very Good
3- Often	2.5-3.24	Good
2- Sometimes	1.75-2.49	Poor
1- Never	1.0-1.74	Very Poor

B. Students Study Habits Questionnaire (Appendix B). This questionnaire was adopted by Lucas and Corpus (2014). The items were constructed using a 4-point Likert scale format, and the students responded to the statements on a scale ranging from always (4), often (3), sometimes (2), to never (1). The instrument contains 55 items with six constructs, namely, motivating (8 items), Organizing and planning one's work (10 items), Working with others, Utilizing resources and feedback (8 items), Managing School Work Stress (8 items), Note-taking and reading (11 items), and preparing an assignment/project (10 items). The questionnaire contains items relevant to this study since it emphasizes students' study habits.

In determining the student's study habits, the study used the following continuum:

Responses	Continuum	Interpretation
4- Always	3.25-4.0	Very Good
3- Often	2.5-3.24	Good
2- Sometimes	1.75-2.49	Poor
1- Never	1.0-1.74	Very Poor

Data Gathering Procedure

Before gathering data, the researchers obtained permission from the college dean by submitting a letter outlining their study. Once approval was granted, they prepared a permission letter for the school head and obtained informed consent from the parents or guardians of the participants. The researchers ensured that respondents understood the study's purpose and addressed ethical considerations. They then developed one Google Form for their research instruments and shared the links with the students. Upon completion of the questionnaires, the researchers compiled the data using Microsoft Excel and conducted statistical analyses using the Minitab Application Software. The findings were presented in tables to facilitate the analysis and interpretation of the data.

Ethical Considerations

To uphold the ethical aspect of this study, the researcher sought the respondents' voluntary participation. The researchers explained the goal of the study and assured the respondents that their participation would not harm them in any way. The researcher valued respect for the respondents' dignity and ensured that respondents' privacy was protected. Study data was kept secure, and the students and teachers involved were anonymous.

Furthermore, were avoided and there were dishonesty and exaggeration about the research's goals and objectives, and she revealed no relationships, funding sources, or any conflicts of interest. Any communication regarding the research was done transparently and providing false information or misinterpreting primary data findings were avoided. Finally, the researcher asked the respondents to sign the informed consent as proof of their willingness to participate..

Data Analysis

The study utilized Minitab Software to analyze the gathered data.

Frequency and *percentage* were used to determine students' performance in mathematics.

Mean and Standard Deviation were used to determine students' basic math skills and study habits.

The Pearson Product Moment Correlation Coefficient was used to explore the significant relationship between the students' basic math skills, study habits, and mathematics performance.

Stepwise Multiple Regression Analysis was used to identify the constructs in the student's basic math skills and study habits that may predict singly or in combination with students' mathematics performance.

III. Result and Discussion

Basic Mathematics Skill

Table 1 summarizes the basic mathematics skills of students: knowing and understanding, estimating, computing and solving, visualizing and modeling, representing and communicating, conjecturing, reasoning, proving and decision-making, and applying and connecting. The general outcome of basic math skills is reported as good, with a mean score of 3.18 and a standard deviation of 0.73. Data demonstrates that teachers successfully fulfilled delivering an entertaining climate of knowing and understanding, approximating, computing and solving, visualizing and modeling, representing and communicating, speculating, reasoning, proving and deciding, and applying in support of student positive effects for math achievement. Data as a whole that was provided in these exhibits indicates teachers have succeeded in enhancing their students in virtually every domain of primary math.

Specifically, students performed very well in representing and communicating mathematics concepts (M=3.25, SD=0.72). The students are able to write mathematical ideas clearly and comprehensively. Students are performing very well in terms of representing and communicating mathematics concepts or elementary mathematics skills. This rating suggests that the students are at a good level in making sense and expressing mathematical ideas. While the mean score is generally good, a standard deviation of 0.72 suggests that there is some variation in student scores. It means that while most students are doing extremely well, not all of them have mastered the material equally. A standard deviation of 0.72 would indicate moderate variation but enough to bring out the difference in performance and not too large to suggest major inconsistency.

These variations can then be related to the change in fundamental math skills and study skills among the students. More capable students with sound foundational math skills or better study habits are most likely to score high, and less capable students with poor foundational skills or poor study habits are going to score below average. Further investigation into these factors will enable us to find a much deeper understanding of how these factors relate to the learning and ability of students in math.

Students did reasonably well in other mathematics basic math skills: knowing and understanding M=3.21, SD=0.69; estimating, computing, and solving M=3.09, SD=0.69; visualizing and modeling with M=3.16, SD =0.75; in conjecturing, reasoning, proving, and decision-making with M=3.16, SD=0.79; and applying and connecting mathematical concepts with M=3.23, SD=0.74. The average score of knowing and understanding is 3.21, which means students have a very good understanding of basic mathematical knowledge and understanding. That includes familiarity with mathematical facts, concepts, and principles that enable them to understand and retain the material taught (Gierl, 1997). In general, students are well-equipped to understand and recall mathematical ideas that are the heart of overall mathematical competence and academic achievement (Yang et al., 2018)(Brijlall & Ally, 2020). Although it had varied across those dimensions, the general performance remained positive (Powell & Fuchs, 2012).

Teachers have effectively enhanced the basic mathematical skills of students through clear explanations and visual aids with an interesting and entertaining learning environment. They used different types of teaching techniques, such as problem-solving and higher-order thinking, and attempted to relate concepts to real life. Their well-balanced focus and continued professional development led to consistent performance and high proficiency in the communication of mathematical ideas. Overall, the teachers succeeded because of their interactive method, clear communication, and practical application of mathematical ideas.

Teaching and learning mathematics should be an empowering tool for the learner in how he is able to apply the mathematical principles to the practice of proper solving of real-life problems (Mazana et al., 2020). A student needs to understand how the concepts in mathematics work so that they are able to generate both idealized school exercises as well as day-to-day wrangles (Kesumawati, 2018). Research on seventh-grade students should focus on developing their mathematical sense because factors both inside and outside a student impact the understanding and usage of material learned.

However, other aspects of the representation of mathematics are difficult for the students to handle; defining a concept with writing, models, diagrams, and symbols and changing one representation into another proved difficult for the learners (Susiaty & Haryadi, 2019). Teachers have played an important role in helping their students improve their understanding of mathematical concepts through their understanding of their students' development and providing them with one-to-one support while learning (Darmawan et al., 2024). Strategies in teaching help develop students' understanding of mathematics as well as solve problems in the classroom and even outside.

Even with these efforts, there could be small regions where teaching and learning could improve. There is a small inconsistency in student performance regarding those dimensions, although teachers have achieved great proficiency in enabling students to represent and express mathematical ideas, some abilities, including estimating, computing, solving, visualizing, modeling, and reasoning, might need greater emphasis. To fill the gaps, proper instructional strategies, along with professional training for teachers, will further solidify their capacity to help their students meet those critical mathematical skills.

Table 1.
Basic Mathematics Skills

Construct	Mean	SD	Remarks
Knowing & understanding	3.21	0.69	Good
Estimating, Computing & Solving	3.09	0.69	Good
Visualizing & Modelling	3.16	0.75	Good
Representing & communicating	3.25	0.72	Very Good
Conjecturing, Reasoning, Proving and Decision Making	3.16	0.79	Good
Applying & connecting	3.23	0.74	Good
Overall Performance	**3.18**	**0.73**	**Good**

Note: 3.25-4.0 (Very Good); 2.50-3.24 (Good); 1.75-2.49 (Poor), 1.0-1.74 (Very Poor)

Study Habits

Table 2 reveals the study habits of the students in key areas such as motivation, organization and planning, working with others, utilization of resources and feedback, management of stress, note-taking, and preparation of assignments/projects. Overall, the study habits of students toward mathematics is reported as good (M=3.20; SD=0.75), which reflects, in general, good attitudes toward studying and some level of diligence that would contribute to the student's academic performance. However, the standard deviation of 0.75 shows moderate variability; this means that although many students have good study habits, the consistency of those habits varies among students.

The results suggest that students' study habits are influenced by their perception of mathematics as an interesting and valuable subject, contributing to greater engagement and academic performance. It was evident in their strong motivation (M=3.31, SD=0.68) and their ability to prepare assignments and projects effectively (M=3.42, SD=0.62). These high scores indicate that students are highly driven and capable of managing substantial academic tasks—essential skills for achieving success in mathematics. Furthermore, students demonstrated proficiency in note-taking and reading (M=3.31, SD=0.72), which supports their ability to comprehend and retain mathematical concepts. The stronger motivation is correlated with more engagement in the material and perseverance over challenges one faces in academics. Such factors are connected to better performance and a good attitude toward the subject.

The ability to plan, research, and prepare assignments and projects effectively (M=3.42) implies that the students are highly efficient at planning, researching, organizing, and presenting their work. All these skills are crucial in academic performance and can easily be applied in other educational or professional settings. Efficiency in note-taking and reading provides for easy comprehension and retention, hence better academic outcomes. Hence, proficiency in note-taking and reading supports better academic performance, as noted by Holenstein et al. (2020).

But other aspects, which include the organization and planning of work (M=3.02, SD=0.84), working with others and the use of feedback (M=3.13, SD=0.79), as well as managing schoolwork stress (M=3.02, SD=0.87), are rated as "good, but with potential for development. Efficient organization and planning enable proper time management and adherence to time schedules. Enhanced performance in those areas may reduce procrastination, making students feel more competent about their schoolwork (Villa, 2023) further adds. Collaboration, which includes peers' collaboration and the resources and feedback, also scored moderate (M=3.13), which means that basically, students are good in the area, but they can do well by working on their teaming and applying the application of feedback skills. With positive collaboration, students will also have access to various perspectives and shared knowledge that might deepen comprehension and improve problem-solving capabilities (Panjaitan & Zuhri, 2020). Handling schoolwork-related stress was also scored to require more improvement (M=3.02). The better mental well-being of the students who effectively manage academic pressure positively influences their academic performance (Pirrone et al., 2022).

Workshops on time management, teamwork, and stress management would be good interventions to address the areas for improvement. Such programs would help the students improve their study habits and thus improve their academic performance and well-being.

The study points out that students' overall study habits in mathematics are positive, driven by their perception that the subject is valuable and enjoyable. Their motivation is strong; they are effective in note-taking and project preparation. However, the findings point to the need to strengthen the student's organizational skills, collaboration, and stress management abilities, which are crucial for sustained academic success.

Past researchers have developed the importance of study habits like note-taking, sources from libraries, and proper time management toward academic success. A supportive structure, such as group guidance involving professional counselors in schools, has to be offered to encourage effective study habits among students. Other than that, upgrading functional libraries can be more useful for students in mathematical learning (Sakirudeen & Sanni, 2017). All findings based above revolve around the necessity of schools having supportive structures that would improve students' study habits and performance at school.

One of the difficulties is that keeping students motivated toward learning mathematics in an institution of learning becomes challenging. Academic performance and, hence, possible performance at career levels are significantly aligned with motivation (Saadati & Celis, 2023). Students' participation in learning depends upon intrinsic motivation. For example, research studies hypothesize that if students like doing and have no motivation through any extrinsic awards, then there is a stronger motive to learn (Briones et al., 2022). However, external goals are as important as an outstanding motivator, and several research studies have reported high extrinsic goal orientation (Suren & Kandemir, 2020).

A student depicts middle-order academic study habits characterized by the trend of timely submissions of assigned tasks and averting procrastination. However, beyond these, it is the students with stronger, effective working habits that truly do better in school: they will show improvement in their organization and collaboration competencies and control of stress. Targeted interventions in the form of workshops on time management, collaborative projects, and ways to reduce stress can enable students to construct a much more balanced and effective set of study habits, which increases both their academic performance and well-being (Tus, 2020).

Table 2.
Study Habits

Construct	Mean	SD	Remarks
Motivation	3.31	0.68	Very Good
Organizing and planning one's work.	3.02	0.84	Good
Working with others; Utilizing resources and feedback	3.13	0.79	Good
Managing schoolwork stress	3.02	0.87	Good
Note-taking and reading	3.31	0.72	Very Good
Preparing an assignment/project.	3.42	0.62	Very Good
Overall Performance	**3.20**	**0.75**	**Good**

Note: 3.25-4.0 (Very Good); 2.50-3.24 (Good); 1.75-2.49 (Poor), 1.0-1.74 (Very Poor)

Students' Mathematics Performance

Table 3 indicates the performance of the students in mathematics. Mathematics performance was calculated for the students and graded against different satisfactory values. Overall, there is satisfactory performance among the students concerning mathematics on average (M=86.49). The performance, on average, was more than the minimum satisfactory value and thus promising. The medium used to measure the performance comprised a number of tests, quizzes, assignments, and exams.

Regarding this, their grades fall into different categories due to mixed levels of satisfaction. These categories give us an idea of how the students are performing in terms of learning outcomes. An average score of 86.49 indicates that on an average level of mathematics, the students are satisfactorily performing. That would probably be "satisfactory" on the regular grading scale: most of the students are all right and do not disappoint anyone's minimum expectations regarding such understanding and application of mathematical concepts.

The highest percentage was that of students with a satisfactory level of performance: f=42; %=34.71. Students who performed satisfactorily occupied second place with a percentage of f=30; %=24.79. Students with outstanding levels of performance accounted for only a small percentage of 12.40: f=15. However, a significant percentage of students scored a fair grade (f=18; %=14.88), and a slightly smaller group scored an unsatisfactory grade (f=16; %=13.22). Thus, this f=42 is the number of students who performed satisfactorily in mathematics. This percentage signifies that nearly one-third of the student population performed at a satisfactory level. A satisfactory level of performance means these students are at least achieving the minimum standards for the understanding and application of mathematical concepts. Their performance is satisfactory, but they still have room for growth to move up to higher levels of proficiency. This f=30 represents the number of students who performed very satisfactorily in mathematics. It represents nearly a quarter of the students, indicating a better level of achievement than the satisfactory group. Students in this category demonstrate a good understanding of mathematical concepts and are performing above average. They are well-prepared for more advanced mathematical challenges and have a solid grasp of the material. This f=15 represents the number of students who achieved an outstanding level of performance. This f=18 represents the number of students who demonstrated a fair level of performance in mathematics. It means that nearly 15% of the students scored below satisfactory grades but demonstrated some appreciation for the subject. In this group, support in addition to targeted intervention should be offered to these students so that they improve their mathematics skills. The students demonstrate a general grasp of the concepts, though not to the expected proficiency, and require additional help and support. These students are typically sound in mathematics and should thus perform well in advanced studies. High performance is a result of a deep understanding and ability to apply mathematical principles effectively. This f=16 comprises the number of students that fall into the unsatisfactory category. It shows that more than 13% of students do not meet even the basic expectations in mathematics.

The data show that while a significant portion of students performed satisfactorily, there is room for improvement, particularly among those who achieved only fair or unsatisfactory results. The outstanding performers (M=97.27, SD=1.38) had the highest average scores, ranging from 95 to 99, which reflects their excellent understanding and command of the subject. In contrast, students in the unsatisfactory grade range (M=75.81, SD=0.88) fell between 75 and 77. Their results indicate the challenges those students face in terms of gaining a good understanding of some crucial mathematical concepts. In all, the performance levels show a need for focused improvement for students who struggle in mathematics and for improving their satisfactory levels to more competent performance levels.

Students' Mathematics Performance is highly affected by their level of academic engagement. That is because improved cognitive, behavioral, and affective engagement can increase and promote students' performance in mathematics. According to a study, there is a positive correlation between students' behavioral engagement and their mathematical performance, demonstrating that students' performance in mathematics is significantly influenced by their diligence and attention in the classroom. The level of diligence and focus that students show in the mathematics classroom may improve their performance in the subject. It also means that learning outcomes will rise along with an increase in learning interest. Students' learning is significantly affected by their level of interest in the topic they are studying. If the topic is uninteresting to them, they will not learn effectively (Awofala et al., 2024).

Students are faced with difficulty when they have low learning motivation (Harefa, 2020). When the interest of students is lost, and they cannot see the relevance of their learning goals, their motivation to engage fully with educational tasks is often lacking, which hinders them from comprehending the material presented by teachers. It arises because students lack enthusiasm for educational activities and may not fully understand the importance of focusing on and mastering the subjects taught by teachers (Fau, 2022). Students will lose interest in the topic and become less motivated to study. However, the absence of motivation was strongly associated with students' satisfaction with their needs for capability and independence in the learning environment. Additionally, it had a poor relationship with their Degree of satisfaction and confidence in their academic decision. According to a study, students' passive attitude toward studying and the ability to complete assignments automatically without any specific goals appear to be related to their negativity about the study environment and their confusion about making the best study choice (Puklek Levpušček & Podlesek, 2019).

In mathematics, students' achievement was largely satisfactory or even very satisfactory. Divergent instruction based on their different learning needs will only help to enhance the teacher's results. Personalized plans and small group activities will require addressing particular skill gaps for some and challenging high achievers beyond what has been taught thus far. Strengthening feedback mechanisms and promoting self-assessment practices can empower students to actively monitor their progress and improve comprehension. Intensive support programs for students who are at the fair or unsatisfactory level and the inclusion of real-world applications to engage students will ensure a better understanding of mathematical concepts. Professional development of teachers and encouraging parents to support mathematical learning at home are essential elements to be sustained in order to maintain improvements and ensure continued student success.

Table 3.
Students' Mathematics Performance

Satisfaction Level	Frequency	Percentage	M	SD	Min	Max
Outstanding	15	12.40	97.27	1.38	95	99
Very Satisfactory	30	24.79	91.37	1.55	89	94
Satisfactory	42	34.71	85.88	1.65	83	88
Fair	18	14.88	80.33	1.33	78	82
Unsatisfactory	16	13.22	75.81	0.88	75	77
Overall Performance		**100**	**86.49**		**Satisfactory**	

Note: Performance Scale: 95-100 (Outstanding); 89-94 (Very Satisfactory); 83-88 (Satisfactory); 78-82 (Fair); 72-77 (Unsatisfactory); 71< (Failed)

Significant Relationship Between Students' Basic Math Skills and Their Performance in Mathematics

Table 4 shows a crucial relationship between basic mathematics skills and the achievement of students' mathematics performance. Basic mathematics skills based on students' mathematical achievements were measured using various variables. Such as knowing and understanding, estimating, computing and solving, visualizing and modeling, representing and communicating, conjecturing, reasoning, proving and decision-making, and applying and connecting. The data reveal that while some skills were significant, the overall performance showed no significant remarks (r=0.17, p=0.19). It indicates that basic math skills had a limited impact on students' overall mathematical achievements. The data indicates that certain basic math skills have a significant relationship with students' performance in mathematics.

It indicates that the mastery of these particular skills is positively associated with better performance in mathematics. The correlation coefficient (r=0.17) indicates a positive but rather weak association between students' basic math skills and their mathematics performance. A correlation coefficient close to 1 would indicate a stronger relationship. The p-value of 0.19 suggests that this correlation is not statistically significant at the conventional significance level of 0.05. This result implies that the observed correlation could be a result of chance rather than a real relationship. The fact that the overall correlation is not statistically significant (p=0.19) implies that the fact that specific math skills are important is true, while the overall proficiency in simple math skills does not greatly impact the general mathematical competence of the students. Other factors, such as study habits, motivation, teaching methods, or individual learning styles, may play a bigger role in determining the performances of students in mathematics. Mathematical achievement is a culmination of a number of things that go beyond basic math skills alone. While these are essentials, problem-solving abilities, critical thinking, and conceptual understanding all contribute highly to overall performance. This information can be useful for educators to provide instruction where not only basic math skills development is focused upon but the higher-order thinking skills, as well as application, are emphasized. The holistic way of instruction might lead to more comprehensive and effective results in mathematics. The recent reform in mathematics education has been driven by both poor student performance on mathematical concepts, skills, and strategies tests and by the growth of the influence of constructivism, a theory of cognitive development (Babakr et al., 2019).

Pearson Product Moment Correlation Coefficient was used to determine the relationship between basic math skills and mathematical achievement. In knowing and understanding basic math concepts, a moderate positive relationship with mathematical achievement was revealed to have been shown, where $r = 0.28$, $p < 0.01$; it means a very significant remark. That is, it show that students who really have a good understanding of fundamental mathematical concepts tend to have better mathematics achievement generally. Estimating, computing, and problem-solving skills also correlated positively with mathematical achievement ($r = 0.24$, $p < 0.05$), which is a significant comment. It implies that the attainment of better grade scores in mathematics requires mastery of computational and problem-solving abilities.

The other dimensions, such as visualization and modeling, $r = 0.18$, $p = 0.06$; representation and communication, $r = 0.08$, $p = 0.47$; conjecturing, reasoning, proving, and decision-making, $r = 0.09$, $p = 0.47$, and applying and connecting, $r = 0.15$, $p = 0.11$, were not shown to have statistically significant correlations with mathematical achievement. These results, therefore, indicate that though these skills are a crucial part of broader mathematical learning, they could not independently influence the outcome measured by this study of general performance in mathematics.

Teachers get better mathematical results by concentrating their efforts on developing basic understanding and problem-solving skills, which closely relate to overall performance. This approach focuses on developing efforts to enhance students' basic grasp of mathematical concepts and, consequently, their computational abilities. Even though visualization, communication, reasoning, and linking skills are important, their direct relationship with the general performance in mathematics becomes evident through certain instructional techniques. In that regard, this is towards equipping these students with basic knowledge as well as the core competencies in mastering mathematics.

Relational understanding made it easier for students to remember mathematical rules and gave them the ability to adapt their knowledge to solve new problems. Students with relational understanding are proactive in discovering new areas to apply mathematics (Hussein & Csikos, 2023). A comprehensive understanding of concepts and the ability to solve problems help make understanding what the teacher taught in math class easier for the learner. It subsequently goes on to positively influence their potential learning outcomes. Math education performance evaluation would mean evaluating three main elements, namely, conceptual understanding, ability to reason and communicate skillfully, and problem-solving competency (Mangelep et al., 2023). It implies that the ability to solve math problems is positively correlated with academic success, and students who are better problem solvers tend to perform better academically. It also implies that the ability to solve problems is important not only in mathematics but also has a great influence on general academic performance (Rizqi et al., 2023).

Teachers must focus educational efforts on the development of basic understanding and problem-solving skills, two factors known to have positive correlations with overall achievement. Another positive implication of this study is its promise to open new avenues for further research and directed education, as its implications present diverse impacts of various mathematical skills on achievement. It would also reveal the possibilities of targeted interventions to address improvement in computational proficiency as well as problem-solving skills toward personalizing approaches for maximizing mathematics education learning outcomes.

Table 4

Significant Relationship Between Students' Basic Math Skills and Their Performance in Mathematics

Variables	r-value	*p*-value	Remarks
Knowing & understanding	0.28	0.00	Highly Significant
Estimating, Computing & Solving	0.24	0.01	Significant
Visualizing & Modelling	0.18	0.06	Not significant
Representing & communicating	0.08	0.47	Not significant
Conjecturing, Reasoning, Proving and Decision Making	0.09	0.47	Not significant
Applying & connecting	0.15	0.11	Not significant
Overall Performance	**0.17**	**0.19**	**Not significant**

*Note: **p<0.01* (Highly Significant)*; *p<0.05* (Significant)*; p*>0.05 (Not significant)

Significant Relationship Between Students' Study Habits and Their Performance in Mathematics

Table 5 presents the significant relationship between students' study habits and their performance in mathematics. The significant relationship between students' study habits and their performance in mathematics was measured using various variables, including motivation, organizing and planning one's work, working with others and utilizing resources and feedback, managing schoolwork stress, note-taking and reading, and preparing an assignment or project (Table 5). The results suggest that students' cognitive and affective self-concepts in mathematics, along with their extrinsic motivation, are likely to be important indicators of their drive to excel in introductory mathematics classes (Hammoudi, 2018). The overall performance indicates a positive but not statistically significant correlation (r=0.03, p=0.31), suggesting that these study habits collectively had a limited impact on students' mathematical achievements.

The fifth table examines the relationship between students' study habits and their performance in mathematics. It considers various specific study habits, including motivation: The drive and desire to succeed in mathematics, organizing and Planning One's Work is how well students manage their time and plan their study schedules, Working with Others and Utilizing Resources and Feedback: Collaboration with peers, seeking help and using feedback from teachers, Managing Schoolwork Stress: Students' ability to handle academic pressure and stress, Note-taking and Reading: The effectiveness of students' note-taking and reading strategies for comprehension and retention, Preparing an Assignment or Project: How well students prepare and complete assignments and projects. The correlation coefficient shows that the relationship between study habits and mathematics performance of students is very weak, with a positive direction; that is, r = 0.03. It shows that there exists a slight positive relationship that is very minimal. With a p-value of 0.31, it shows that at a conventional significance level of 0.05, the observed correlation is not statistically significant- that is, most likely, the result of random chance rather than a true relationship. The finding is that the overall correlation, not statistically significant (p=0.31), means that, as a group, these study habits do not collectively impact students' mathematical achievements. That is, although individual habits may be important, they do not significantly influence performance when considered together. The collective impact is limited, but individual study habits may play a crucial role in certain contexts. For instance, high motivation may greatly benefit a specific student even though it does not have a strong effect in general. To enhance mathematical performance, a holistic approach that includes improving study habits, quality instruction, and individual needs is necessary. Providing comprehensive support that addresses both academic skills and study habits can create a more conducive learning environment for students.

Analysis of students' study habit variables as related to students' mathematical achievements did not reveal that any of the study habits have significant correlations with students' mathematical achievements. For example, motivation has no significant contribution to mathematical achievement (r=0.12, p=0.21). Similarly, in terms of the organization and plan for the work that shows no significant relation with the influence, r=-0.07, p=0.46. Working with other resources also showed no relationship in this sense, r=0.10, p=0.30 feedback. Managing schoolwork stress was not significantly related to mathematical achievement (r = -0.13, p = 0.13), and taking and reading notes did not relate to mathematical achievement either (r = 0.05, p = 0.60). Academic research is the very tapestry of discovery, but what makes the investigation of variables that have negative r-values so thrilling? In the complex dance of statistical analysis, the r-value, or the correlation coefficient, is a very useful tool in determining the strength and direction of the relationship between two variables. A positive r-value indicates a positive correlation- as one variable increases, so does the other. A negative r-value, however, signifies a negative correlation. The closer the r-value is to -1, the stronger the negative correlation. An r-value of -0.8 shows a more powerful negative correlation than an r-value of -0.3. A high level of negative correlation does not necessarily mean that variations in one variable cause variation in the other. Something else might be driving that relationship. Correlation alone cannot establish whether the type of relationship is found between variables or not (Twenge & Hamilton, 2022). When the r-value is negative, it means that variables have an inverse relationship, and therefore, when one variable increases, another variable decreases (Hindelang, 1971). Preparing assignments and projects is still not significant, although slightly higher in this case, with r = 0.13, p = 0.15. Teachers are able to achieve these results by focusing on holistic teaching strategies that are more inclusive than traditional study habits.

They focus on providing an interesting and nurturing learning environment that promotes the intrinsic motivation of the students. They achieve this by incorporating collaborative activities, a wide variety of resources, and giving constructive feedback in class to

create a productive environment for learning. They also teach the management of stress and note-taking strategies, which will help improve students' understanding and retention of mathematical ideas. Although individual study habits of motivation, organizational skills, and preparation to do the task itself do not correlate significantly with mathematical achievements in this study, through support and tailored instructional methods, it can be seen that addressing such areas will bring improvement to students' overall school performance.

The measured study habits did not directly and significantly affect the mathematical achievements of the students (Teoh et al., 2010). Other factors besides these study habits may have a greater influence on mathematical performance, and further research may be required to identify and understand them. Past research has highlighted the role of a wide range of affective variables besides cognitive ability in determining academic achievement in mathematics. For instance, studies have already established that mathematics self-efficacy- that is, the learner's beliefs about their math abilities- is a significant factor in predicting academic performance. Other contributors to mathematics achievement across high school include mathematics anxiety, perceived competence, and even intrinsic interest in learning to do math (Abín et al., 2020). Teachers should focus on creating an attractive and supportive classroom environment that allows students to enjoy learning and develop intrinsic motivation to achieve improved mathematical achievement among students.

It would involve implementing cooperative learning activities, utilization of various resources and learning aids, and constructive reinforcement for the enrichment of the student's understanding of mathematics. Such stress management and note-taking skills would be of further benefit to the student's appreciation of mathematical concepts. There are some specific study habits, such as motivation, organization, and preparation to work on the task at hand, which are not related to mathematics achievement; teaching can intervene with individual support and pedagogy. That way, an overall and holistic intervention ensures good, strong support for mathematical performance overall.

Table 5
Significant Relationship Between Students' Study Habits and Their Performance in Mathematics

Variables	r-value	p-value	Remarks
Motivation	0.12	0.21	Not significant
Organizing and planning one's work.	-0.07	0.46	Not significant
Working with others; Utilizing resources and feedback	0.10	0.30	Not significant
Managing schoolwork stress	-0.13	0.13	Not significant
Note-taking and reading	0.05	0.60	Not significant
Preparing an assignment/project.	0.13	0.15	Not significant
Overall Performance	**0.03**	**0.31**	**Not significant**

*Note: **p<0.01* (Highly Significant)*; *p<0.05* (Significant)*; p*>0.05 (Not significant)

Predictors Of the Students' Performance in Mathematics

Table 6 presents the predictors of the student's performance in mathematics. Stepwise Regression Analysis was used to determine the predictors most influencing students' performance in mathematics, as presented in Table 6. The analysis reveal that knowing and understanding basic math concepts ($\beta = 3.19$, $t = 2.23$, $p = 0.028$) significantly predicts students' mathematical performance. Based on the results of the stepwise regression analysis shown in the sixth table, predictors of students' mathematical performance include the knowledge and comprehension of basic math concepts. Mastery of the fundamental math concepts is indicated to influence students' overall mathematical performance based on a positive beta coefficient, a significant t-value, and a low p-value. This finding underlines the importance of foundational math skills in the curriculum and suggests that educators should focus on making sure students understand these concepts very well to support their success in mathematics.

Positive coefficients for knowing suggest that these improvements in these areas would further the mathematics performance of students under the scope of this study. The outcome reveals the importance of a firm base in basic math concepts as an essential aspect of proper mathematics teaching. Teaching professionals should focus on such foundational skills to build up students' overall mathematical abilities.

This model explains 19.17% of the variance in students' mathematics performance, R2 = 19.17%. Such findings infer that although knowledge of basic math concepts is a major predictor, there are other variables not considered in this model that contribute to the outcomes. The regression equation supplied by this study gives an overall summary of the combined effects of many predictors on students' mathematics performance. Positive coefficients of knowing can be seen with regard to the knowledge improvements that potentially increase the student's performance in mathematics (Mercader et al., 2017) (Hoon et al., 2010) (Cuevas & Berou, 2016). Further studies should be performed to investigate further factors that help students achieve good results in mathematics.

This study emphasizes foundational knowledge in math but suggests a more holistic consideration of multiple aspects of learning is actually required to better understand and ultimately enhance students' mathematical achievement, according to Hajovsky et al. (2019). Factors associated with mathematics academic performance in several studies are. For example, a longitudinal study revealed that self-perceived competence was a significant predictor of subsequent mathematics achievement (Mercader et al., 2017). Moreover, a study Identifying factors for students' motivation in learning mathematics determined several factors that can be used in evaluating academic performance in relation to the level of motivation (Hoon et al., 2010). The findings of the current study, showing the differential effect of various predictors on mathematics performance, are consistent with the literature.

Basic math concepts are critical areas of focus because they are foundational for more advanced learning, and strengthening them can significantly improve students' overall mathematical performance. The strong predictive value associated with knowledge of basic math concepts indicates that interventions aimed at these areas can produce significant gains in math outcomes for students.

Improved performance in mathematics is associated with increased confidence and ability to tackle complex problems when students have a solid understanding of fundamental math concepts.

Moreover, the results show that of all the core math skills and study practices investigated, only "knowing and understanding" is positively related to student performance in math. That means, in effect, a sound understanding of math matters most, much more than a number of other skills or study methods. Emphasizing that "knowing and understanding" are at the heart of math knowledge. If students can understand and apply basic concepts and principles well, they are well prepared to solve problems and apply math in different contexts. It means that instructional strategies focus on building such foundational understanding as opposed to rote memorization or procedural fluency. While "estimating," "computing and solving," or "visualizing and modeling" are all important skills, their absence of a statistically significant correlation in your study presents questions. It does not make their unique contribution statistically speakable. Also, in this context, these skills can be strongly interwound with "knowing and understanding"; therefore, their separate influences on the entire math performance would probably not have been captured totally by their assessment. Different mathematical concepts taught or grades of students have differently weighed on the relative significance of these skills. It is important to note that students' study habits, including motivation, organization, and note-taking, did not correlate well with math performance. It differs from much of the research that indicates positive relationships between these factors and academic achievement, such as your note about internal motivation and math grades. The effective study strategies used for mathematics may be substantially different from those used for other subjects. Perhaps methods that prove effective for history or language arts are not as influential for math. The evaluation of study habits to determine their true impact on learning math is also not always an easy task. Your research could consider other methods or tools to assess this area.

In conclusion, the findings highlight the multifaceted nature of math achievement. While "knowing and understanding" emerges as a primary driver, it is crucial to consider the potential interplay of other skills and study habits.

Table 6

Predictors Of the Students' Performance in Mathematics

Predictors	**Coef (β)**	**SE Coef**	**t- value**	**p-value**
(Constant)	83.72	3.68	22.76	0.000
Knowing & understanding	3.19	1.43	2.23	0.000
R^2 = 19.17%				
Dependent Variable: Students' Mathematics Performance				
Students' Performance= 83.72 + (3.19 Knowing)				

IV. Summary and Findings

Summary

The goal of this study was to investigate the basic math skills and study habits of the students to determine their performance in mathematics. A descriptive-correlational design was used to acquire data. Data were acquired through two questionnaires from 121 junior high school students; these were Students' Basic Math Skills and Students' Study Habits. Google Forms was utilized in the data collection, taking into consideration the appropriate permissions and consent letters. The data collected was input and computed using the Excel and Minitab software. Findings were put on tables. Ethical principles were observed in compliance with the Data Privacy Act of 2021 and ethical consideration guidelines, as stated by Bryman and Bell (2021). Mean, standard deviation, frequency, percentage distributions, Pearson Product-Moment Correlation Coefficient, and Stepwise Multiple Regression Analysis were used in analyzing statistics.

This study determined the relationship between basic math skills, study habits, and mathematics performance. It investigated the significant relationship between basic math skills and study habits and their impact on mathematics performance. Moreover, the study provided valuable information about the factors that influenced students' performance in mathematics, students' basic math skills, and study habits.

Findings

The following are the salient findings of the study:

1. The students' basic math skills were good in terms of knowing and understanding, estimating, computing and solving, visualizing and modeling, conjecturing, reasoning, proving, decision-making, and applying and connecting while representing and communicating well.
2. The students' study habits were very good regarding motivation, effective note-taking, and preparedness, while organization, active engagement, use of resources, and management of schoolwork stress were good.
3. The students' performance in mathematics was satisfactory.
4. There was a highly significant relationship between the students' basic math skills regarding knowing understanding and students' performance in mathematics; there was a significant relationship between estimating, computing, solving, and students performance in mathematics, while there is no significant relationship between visualizing & modeling, conjecturing, reasoning, proving, and decision-making, and applying & connecting, representing and communicating and students' performance in mathematics.
5. There was no significant relationship between students' study habits regarding motivation, organization, active engagement and use of resources, managing schoolwork stress, effective note-taking, and preparedness, and students' performance in mathematics.
6. Students' basic math skills in terms of knowing and understanding in terms of value were significant and have impacted the students' performance in mathematics.

V. Conclusions and Recommendations

Conclusions

The conclusions derived from the findings were the following:

1. The students' basic math skills were impressive, manifested through different areas such as understanding, estimation, computing, and decision-making. Students are found to be excellent in representing and communicating mathematical concepts, showing great potential to develop better mathematical performance.
2. Most students' good study habits included motivation, effective note-taking, preparation for classwork, organization, active involvement in classwork, using available resources, and managing stress. Improved practices include reduced stress and optimal use of available resources.
3. Students have performed adequately in mathematics with a good set of basic skills, strong representations, and communication of mathematical ideas. These students, with effective representation and communication of ideas, are likely to improve their academic performance.
4. There was a good correlation between basic math skills and mathematics performance, with much emphasis on understanding basic concepts. Practical skills such as estimation and computation were also correlated with performance. However, higher thinking and communication skills did not have much influence on overall performance.
5. The correlation is found not significant in studying among the students with respect to mathematics performances. Inherent abilities and the outside supporting structures become significant more.
6. Students' performance in math seems largely influenced by the fundamental arithmetic operations. They comprehend, estimate, calculate, and solve, and so proficiency in those aspects becomes fundamental to them.

Recommendations

The following are recommendations based on the findings and conclusions.

1. Mathematics Skills. Focus on deepening math understanding through exercises, problem-solving workshops, and interactive learning. Diversify communication methods, including diagrams, presentations, and technology, for applying math to real-life problems.
2. Student Study Skills. Encourage students to share their note-taking and motivational ideas. Use such tools as planners and some stress reduction techniques to foster organization, engagement, and stress management.
3. Differentiated Support: Provide support for students who are struggling by using interventions such as peer tutoring, stress problem-solving, and critical thinking.
4. Building Estimation Skills: Use games, drills, and open-ended tasks to build math fluency and encourage multiple approaches to problem-solving.
5. Student Responsibility: Teachers can guide, but the key to success is the student's response. Strengthen foundational knowledge and provide feedback to adjust teaching strategies.
6. Future Research: Investigate instructional quality, learning environments, and socioeconomic factors, and do longitudinal studies to understand their effects on math performance.

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