

# Factors Associated with Mathematics Performance

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## ABSTRACT

**Aims:** The purpose of this study is to identify the factors associated with the academic performance of Grade 10 students during their First Quarter of school as well as the significant correlation between the factors and student academic performance in Mathematics.

**Study design:** Descriptive Correlation Design

**Place and Duration of Study:** The study was conducted at Agusan National High School in Cagayan de Oro City's East 1 District during the school year: 2022 - 2023

**Methodology:** The respondents were Two hundred thirty-one (231) students in Grade 10 at Agusan National High School in Cagayan de Oro City's East 1 District. This study used a researcher-made questionnaire that underwent validity and reliability testing and the academic performance of the students.

**Results:** The results showed that students agree with routines related to mastering Mathematics at a high level. Furthermore, there is no correlation between student study habits and Mathematics performance in terms of self-confidence, but there is a substantial positive association between the student's study habits and performance in terms of attitude. The study habits and learning techniques used by students were found to be important determinants of how well they performed in Mathematics. The researcher strongly suggested using the enhancement plan in teaching Mathematics to Junior High school students.

**Conclusion:** Students have a very positive attitude toward their study habits when learning Mathematics. Students felt that studying and learning Mathematics was essential. Students' success and academic growth depend heavily on their Mathematics performance. It is essential for pupils to master and comprehend its concepts. Students' study habits in terms of attitudes have an impact on how they learn Mathematics.

*Keywords:* Attitudes, Learning Strategies, Math Performance, Study habits

## 1. INTRODUCTION

In the modern world, Mathematics is used in a variety of contexts, including the economy of a nation, building construction, marking, and appraisal of people. It is accurate to claim that Mathematics has played a significant role in establishing the fast-paced lifestyle with all of its comforts and pleasures. One could not survive in the REAL world without Mathematics. It is applied to buy the things we want, measure, tell the time, and so forth. The foundation in Mathematics is important from simple to more complex topics like Geometry, Algebra, and the metric system. One could not survive in the real world without Mathematics.

Despite its importance and contributions, many students claim that they detest Mathematics and that it is a pointless, boring, and even difficult subject. No wonder Filipino students rank Mathematics as one of the most challenging academic disciplines. Countries continually pay attention to students' Mathematical ability since it is regarded as the primary topic that is important for expansion and development (Capuno et., al 2019).

Moreover, Dangle et al. (2020), in their study on "The Implementation of Modular Distance Learning in the Philippine Secondary Public Schools," most of the students have difficulty solving. Problem-Solving does not

29 only include and require computation, but there is a need to understand and analyze the problem. It is  
30 important that students comprehend the problems.

31  
32 Mathematics, in particular, is commonly seen to be difficult, perplexing, and unappealing to certain people.  
33 Mathematics has a stigma attached to it, and those who excel at it are frequently viewed as though they are  
34 entirely normal. Beyond the application of fundamental numeracy abilities, Mathematics is important. It is  
35 also the best way to help students improve their logical reasoning and higher-order cognitive abilities. In this  
36 regard, fostering a good attitude toward Mathematics among students is a key objective in Mathematics  
37 education.

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39 In general, Filipino students thrive in acquiring knowledge but struggle in subjects that require higher-order  
40 thinking skills. The Filipino students' performance in Mathematics needs to be improved as reflected in the  
41 2017-18 Global Competitiveness Report, wherein the Philippines ranked 79th out of the 138 participating  
42 countries in terms of quality Science and Mathematics education (Schwab, 2018).

43  
44 So, Mathematics is challenging for students. This might be about the attitude of the students toward this  
45 subject or maybe on the strategies in learning Mathematics that are affecting their academic performance.  
46 These are just a few of the questions that tickled and inspired the mind of the researcher to conduct an  
47 investigation and gather data that can aid the need for explanations on these continuing adversaries.

48  
49 Attitudes and the affective domain are important for students learning Mathematics. The Mathematics  
50 teachers' plan for their instructional activities may be influenced by their investigation of how the pupils view  
51 Mathematics. Teachers have a significant impact on how students think and behave. However, contrasting  
52 results on this matter have shown wherein Singh et al. (2021) revealed an unforeseen outcome that showed  
53 that the connection between interest and Mathematics execution was inconsequential. The investigation  
54 embraced interest and self-viability as the persuasive factors and inferred that educators' passion helped  
55 affect Grade 7 students' interest in Mathematics subject. Meanwhile, Mazana et al. (2019) stated that a  
56 number of factors, such as students' attitudes and confidence toward the subject, teachers' instructional  
57 practices, and school environment, have an impact on students' learning and performance in Mathematics.  
58 Student attitudes and how much they like Mathematics greatly predicted how well they would succeed.  
59 People frequently claim that one shapes their life through their attitude. In essence, an attitude refers to how  
60 one judges things like people, things, issues, or occurrences. Depending on how one chooses to see the  
61 scenario, they may be either positive or negative. The elements could include, for instance, an emotional  
62 element, where how one evaluates a situation. The cognitive element, which is based on one's beliefs and  
63 views on the subject, is another component. The behavioral component is the final and most crucial  
64 component (Ghosh, 2020). According to El Said (2021) and Lee et al. (2021), a learner's Mathematics  
65 performance improves when they have a good attitude toward learning. Given that attitude and performance  
66 are closely associated, the study of Tamayo (2021) revealed that positive attitude and disposition toward  
67 Mathematics and further stated the better their Mathematics Performance, the higher their grade.  
68 Significantly, this implies that they value the importance of Mathematics not only in their academic endeavor  
69 but also in the different facets of life.

70  
71 An attitude of self-confidence in one's abilities and skills. It implies that the person feels in charge of their life  
72 and that they or accept and trust themselves. One that has a positive opinion of themselves and is aware of  
73 their skills and weaknesses. They can manage criticism, speak assertively, and set reasonable expectations  
74 and goals. On the other hand, poor self-confidence might make a person feel insecure, docile, or weak or  
75 make it difficult to trust other people. That person could be sensitive to criticism, feel unwanted, or feel  
76 inferior. Depending on the circumstance, a person might not always feel self-assured. For instance, that  
77 person might have a high level of confidence in certain areas, like academics, but a low level of confidence in  
78 others, like relationships. Thus, it is fascinating to know the impact of self-confidence on one's performance,  
79 like in Mathematics. Respondents to Mazana and Mzomwe's (2019) survey on self-confidence felt insecure  
80 about their ability to master Mathematics. They thought they were not very adept in Mathematics. This  
81 demonstrates the significance of self-assurance and how the student's attitude toward mathematics was  
82 negatively impacted by a lack of confidence. Teachers should therefore employ techniques that will increase  
83 pupils' confidence in Mathematics.

84  
85 Another consideration of challenges towards Mathematics performance is the student's strategies in studying  
86 the subject. These strategies may include reading as well as think-pair and share. Just like reading literature,  
87 one should also learn to read Mathematics because it has its own unique reading protocol. Similar to how

88 they learn to read a book or a poem, listen to music, or look at a painting, students need to learn how to read  
89 Mathematics.  
90

91 Meanwhile, students use the collaborative learning approach known as think-pair-share (TPS) to work  
92 together to solve a problem or respond to a question regarding a given reading. Students must think  
93 independently about a subject or respond to a question; and share ideas with classmates as part of this  
94 method. Partner discussions increase engagement, concentrate attention, and get pupils interested in  
95 understanding the reading material (Shanahan, 2020). The subjects of English and Mathematics are  
96 particularly difficult for many high school students when it comes to communicating in English and giving  
97 answers or explanations in Mathematics. Students with minimal writing experience will struggle to  
98 communicate their views. As a result, when the teacher asks the class to write or perform TPS, the students  
99 struggle (Tuananay, 2019).

101 In Mathematics teaching, the student's academic achievement is an essential indicator in assessing  
102 educational systems. It narrates the learned or acquired abilities from lessons or competencies in a learning  
103 module which are measured or evaluated through a teacher-made test. Thus, the teacher may check  
104 whether students' learning outcomes showed more significant gains or not after being exposed to the  
105 learning material used or a demonstrated class discussion as part of the learning process. This also allows  
106 the teacher to examine and assist the students' performance and think of ways and means to improve  
107 academic performance further. Mathematics has always been stigmatized as a complex and dull subject.  
108 Additionally, some Mathematics topics or concepts require more time to achieve complete mastery or higher  
109 performance. One of these is the topic or concept of factoring. This concept can be seen as part of the  
110 competencies in Grades 7, 9, and even in Grade 10, with different levels of learning and difficulties. Students  
111 revealed that there were topics in Mathematics that required more time to get mastered (Namocatcat, 2022).

112  
113 Moreover, Jamis (2022) agreed and further stressed that there are topics in Mathematics that require ample  
114 time to be fully mastered and learned by the students. Therefore, teachers must emphasize this by learning  
115 strategies or interventions in order to make the teaching and learning process in Mathematics interesting and  
116 fun for the learners. Ugwu (2019) revealed that teachers' strictness and lack of assistance toward learners  
117 are significant reasons for low performance or achievement in Mathematics. Therefore, teachers must  
118 address these concerns as they can lead to various concerns, even in students' anxiety and self-confidence  
119 toward Mathematics. Zhang (2019) study revealed that students' anxiety could lead to low academic  
120 performance in Mathematics. A higher level of anxiety will also result in much lower academic performance.  
121 Moreover, Peteros (2019) revealed that students' self-rating in terms of ability and skills played an essential  
122 part in Mathematics performance. Students with high self-rating were also individuals with high Mathematics  
123 performance. Guinocor (2020) study revealed that students' learning modes differ. However, with assistance  
124 given to students, they could still achieve higher Mathematics performance. Yeh (2019) showed that helping  
125 low-achieving students was beneficial. They perform much better performance after assistance is given.  
126 Retention levels also increased along with the Mathematics scores.

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128 It is the objective of the study to determine the factors in terms of study habits and strategies associated with  
129 the Mathematics Performance of the students in New Normal Education. Moreover, it will provide data and  
130 information that can be utilized in the hope of minimizing negative impressions towards Mathematics.  
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132 The behaviorist theories of Pavlov serve as the foundation for this investigation. The focus of behaviorism is  
133 on making observations and responding to specific repetitive behaviors that may be evaluated and then  
134 subjected to analysis. Additionally, it places more emphasis on the understandable and concrete nature of  
135 responses. In general, if one cannot observe it, it cannot be researched. Ivan Pavlov, who became well-  
136 known for his studies of stimulus and reaction, is frequently credited with the invention of behaviorism  
137 (McLeod, 2017).

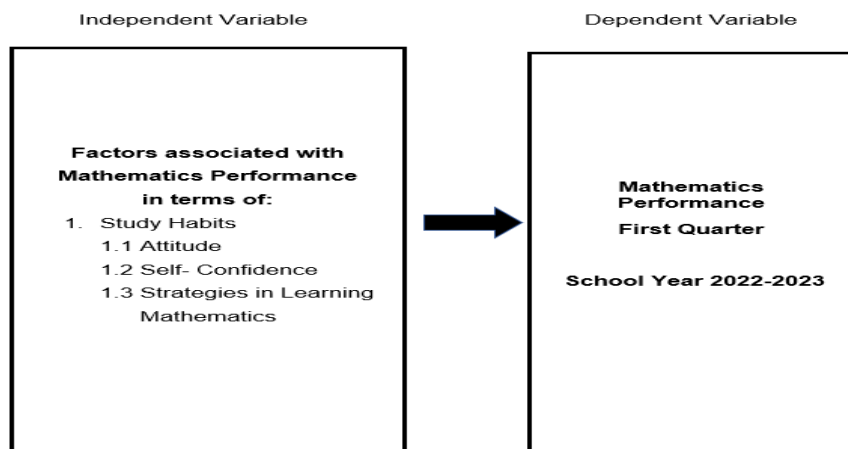
138 Following Pavlov's research, John B. Watson considered it to be a subfield of Natural Science. Watson is  
139 largely recognized as having coined the word behaviorism and being one of Pavlov's most important  
140 supporters. Other significant figures associated with behaviorism are B.F. Skinner and Edward Thorndike.  
141 Skinner is mainly well known because he introduced the concept of operant conditioning, which emphasized  
142 the use of both reinforcements to help individuals learn new behaviors or ideas.  
143

144 Meanwhile the concept of this study specifically on Mathematics performance is in connection with DepEd  
145 Order (DO) No. 8, s. 2015 entitled, "Policy Guidelines on Classroom Assessment for the K to 12 Basic  
146 Education Program" where there are three major components in giving grades to the students. It consists of  
147 Written Works, Performance Tasks, and Quarterly Assessments. Every subject has a different weight of

148 percent in each component. As stated in DepEd Order (DO) No. 8, s. 2015, assessment should be used to  
149 inform and improve classroom practices and promote learning outcomes.  
150

151 In connection with that, to evaluate students learning at points in each quarter, the summative assessment  
152 shall continue in the form of written works and performance tasks. Written works shall be administered to  
153 assess essential knowledge and understanding through quizzes and long/ unit tests. Items should be  
154 distributed across the cognitive process dimensions (DepEd Order No. 8, s. 2015). On the other hand,  
155 performance tasks refer to assessment tasks that allow learners to show what they know and are able to do  
156 in diverse ways. For example, they may create or innovate products or do performance-based tasks,  
157 including skill demonstrations, group presentations, oral work, multimedia presentations, and research  
158 projects. It is important to note that written outputs may also be considered performance tasks (DepEd Order  
159 No. 8, s. 2015).  
160

161 The independent variable of this study is students' study habits in terms of attitudes, self-confidence, and  
162 learning strategies in learning Mathematics. The dependent variable of this study is the students'  
163 Mathematics performance based on their First Quarter grades in Mathematics for School Year 2022 – 2023.  
164 Specifically, this study sought to answer the following questions (1) What factors are associated with  
165 Mathematics performance in terms of Study Habits, Attitudes, Self-Confidence; and Strategies in Learning  
166 Mathematics? (2) What is the Students' Academic Performance in Mathematics during the First Quarter of  
167 the School Year 2022 - 2023? And (3) Is there a significant relationship between the Factors Associated with  
168 Mathematics Performance and the Students' Academic Performance in Mathematics?  
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171 **Figure 1.**  
172 *Schematic Diagram showing the relationship between the Independent and*  
173 *Dependent Variables of the study.*

## 174 **2. MATERIAL AND METHODS**

### 175 **2.1 Design**

176 This study used quantitative research utilizing the descriptive correlation design because it involves  
177 respondents, analysis, and interpretation of data to be gathered. This study involves the interpretation of  
178 numerical data and focuses on testing theories and hypotheses in which variables are controlled and  
179 manipulated. The researcher finds it to be best and appropriate to assess the significant relationships in the  
180 Factors Associated with the Mathematics Performance of Junior High School students at Agusan National  
181 High School.  
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184 Quantitative research describes a research problem through a description of trends or a need for an  
185 explanation of the relationship among variables. The overall structure for a quantitative design is based on  
186 the scientific method. It uses deductive reasoning, where the researcher forms a hypothesis, collects data in  
187 an investigation of the problem, and then uses the data from the investigation, after analysis is made and  
188 conclusions are shared, to prove whether the null hypothesis is accepted or rejected (Namocatcat, 2022). In  
189 quantitative research, the data and/or information are usually gathered using structured research  
190

instruments. The results of the data gathering are based on a larger sample population. The research study can usually be replicated, given its high reliability.

## 2.2 Respondents and Sampling Procedure

The respondents of this study were the selected Grade 10 Junior High School students at Agusan National High School enrolled for the School Year 2022 – 2023. From the total of five hundred fifty (550), Slovin's Formula was used to determine the number of actual respondents to the study, which is two hundred thirty-one (231). Below is the table presenting the total number of students in the Grade 10 level and the actual respondent sample.

Since the study was conducted in a school with a large number of enrolments, the researcher utilized a simple random sampling method. This method is defined as choosing a portion of a population at random. Each person in the population has an exactly equal probability of getting chosen using this sampling technique. The names of all the Grade 10 potential respondents were placed in a bowl, and the researcher randomly picked the two hundred thirty-one names of students that took part as the sample of actual respondents of this study. For privacy, the names of the students were then replaced with numbers and their responses were carefully kept avoiding the exposure of their identity.

## 2.3 Instrument

The study utilized a researcher-made survey questionnaire. The instrument was composed of two (2) major components. The first component was on the Study Habits with thirty-six (36) indicators, of which ten (10) indicators on Attitude, ten (10) for Self-confidence, and sixteen (16) indicators for learning strategies in Mathematics. Finally, the second part is on students' Mathematics Performance which was the grades they obtained during the First Quarter of the School Year 2022-2023.

The result of the reliability test using the Cronbach Alpha was done prior to the survey proper by asking thirty (30) students that served as the respondents for the pilot testing of the questionnaires. The activity was conducted last November 10, 2022. The questionnaire had an overall 0.910 reliability score. The Study Habits resulted in a reliability of 0.916, and Strategy in Learning Mathematics got 0.904, which all belongs to the range of Excellent. Therefore, the questionnaire was acceptable to be used for the survey. The researcher-made questionnaire underwent validation, which Master teachers from English and Mathematics Department graded. After obtaining permission from the validators, the researchers gathered the rating for calculation. The overall mean rating was 4.73, which is Very Highly Valid. This means that the questionnaire was valid and could provide unbiased data for the study, allowing a 0.5% margin of error.

Following the proper protocol, through a written request, the researcher asked the approval from the SPC Dean of Graduate Studies to conduct a study among Junior High School students of Agusan National High School. Upon the approval of the request, the researcher sent the same letter to the Superintendent of the Cagayan de Oro Division. The approved letter was then sent to the School Heads/Principals to gather data from the student respondents. The researcher then proceeded to the orientation of the respondents along with their parents or guardians. Next, the researcher explained to the students, parents, and guardians the contents of the questionnaires and how they would be answered. It was also explained that their participation is voluntary; therefore, they can say no or not participate in the conduct of the study.

## 3. RESULTS AND DISCUSSION

### 3.1 Factors Associated with Learning Mathematics

Table 1 shows the students' Study Habits associated with learning Mathematics in terms of Attitude. It has an Overall Mean of 3.47, with SD=0.88, which is described as Agree and with an interpretation of High level. This means that the students were able to achieve the second-highest level of attitude toward study habits in Mathematics. This implies that the student's attitude on study habits in learning Mathematics is of high level. Students believe that learning Mathematics is important and so they need to study it and learn it. Human intellect and logic are fundamentally based on Mathematics, which is also essential to understand the outside world. Mathematics promotes logical thinking and mental rigor and is a useful method for developing mental discipline (Park, 2020). Additionally, comprehending Mathematics is essential for learning other academic disciplines like Physics, Social Studies, and even Music and Art.

In the same table, the highest indicator, *I want to develop my Mathematical skills*, with a Mean of 4.46 with SD=0.72, which is described as Strongly Agree and interpreted as a Very High Level. This means that the students have a very high attitude toward their study habits in learning Mathematics. Despite the fact that Mathematics is a challenging and difficult subject, the students showed a willingness to study and learn. This quality or mindset can be of great advantage in learning Mathematics. This is because it allows students to have positive thoughts about achieving their goals despite the fact that they will hurdle various challenges along the way.

**Table 1**  
*Students' Level of Study Habits on Attitude*

<b>Attitude</b>	<b>Mean</b>	<b>SD</b>	<b>Description</b>
1. I want to develop my Mathematical skills.	4.46	0.72	Strongly Agree
2. I get a great deal of satisfaction out of solving a Mathematics problem.	3.67	0.89	Agree
3. Mathematics helps develop the mind and teaches a person to think.	4.05	0.81	Agree
4. Mathematics does not scare me at all.	3.04	0.97	Neutral
5. I have a lot of self-confidence when it comes to Mathematics.	3.11	0.88	Neutral
6. I am able to solve Mathematics problems without too much difficulty.	2.99	0.96	Neutral
7. I expect to do fairly well in any Mathematics class I take.	3.51	0.89	Agree
8. I feel a sense of insecurity when attempting Mathematics.	3.34	0.90	Neutral
9. I learn Mathematics easily.	3.10	0.85	Neutral
10. I am confident that I could learn advanced Mathematics.	3.41	0.89	Agree
<b>Overall Mean</b>	<b>3.47</b>	<b>0.88</b>	<b>Agree</b>

**Note:** 4.20-5.00 Strongly Agree 3.40 - 4.19 Agree 2.60 - 3.39 Neutral 1.80 - 2.59 Disagree 1.00 - 1.79 Strongly Disagree

When a person thinks positively, they will maintain a positive attitude in the face of stressful circumstances. Instead, then letting the crisis or setback consume the person, they would be able to look past it. Even though they may need to confront and deal with the drawbacks, that person knows they can overcome them. The person is aware that just because there is terrible news does not mean everything is awful or that nice things will never happen again (Waters, 2022). Instead of expecting the worst and leaping to negative conclusions, someone who thinks positively assumes that others have the best intentions and interprets others' behaviors more positively. Optimistic thinkers are able to envision positive outcomes.

Meanwhile, the lowest indicator, *I am able to solve Mathematics problems without too much difficult* got a Mean of 2.99, with SD=0.96, which is described as Neutral and interpreted as Moderate Level. This means that the students have challenges and struggles in learning Mathematics. Concepts in Mathematics are difficult and challenging, especially when the students are at a higher level of the curriculum. Under K to 12, the concepts are presented in a spiraling manner which means that as the grade level progresses, the more difficult and challenging the examples and exercises are. This can be frustrating and might lead to a negative attitude toward learning Mathematics if not properly supported and guided by the teachers (Oco, 2022). Thus, it is necessary to aid in the form of follow-up, remedial activities, and tutorials to let the students feel that they are not alone and that they can reach their goals and objectives.

Table 2 exhibits the students Study Habits associated with learning Mathematics in terms of Self-Confidence. It has an Overall Mean of 3.52, with SD=0.87, which is described as Agree and interpreted of High level. This means that the students were able to achieve second highest level of Self-confidence towards Study Habits in learning Mathematics.

Self-confidence can be more situation-specific, or it can relate to a broad feeling of trust in one's capacity to govern its life. A person can achieve more success in both personal and professional lives by maintaining a healthy amount of self-confidence. For instance, studies have shown that those with higher levels of

confidence typically outperform their peers in the classroom (Morin, 2022). Furthermore, studies have shown a correlation between higher levels of self-confidence and stronger motivation to practice can also influence a person's drive to achieve their goals and objectives. Even how a person presents himself to others depends on his level of confidence.

**Table 2**

*Students' level of Study Habits on Self-Confidence*

<b>Self-Confidence</b>	<b>Mean</b>	<b>SD</b>	<b>Description</b>
1. When I hear the word Mathematics, I have a feeling of excitement.	3.40	0.91	Agree
2. I have usually enjoyed studying Mathematics in school.	3.73	0.88	Agree
3. Mathematics is fun and interesting.	3.81	0.87	Agree
4. I like to answer new problems in Mathematics.	3.40	0.87	Agree
5. I would prefer to do an assignment in Mathematics than to write an essay.	3.42	0.80	Agree
6. I really love Mathematics.	3.38	0.92	Agree
7. I enjoy Mathematics class more than any other class.	3.20	0.93	Neutral
8. Mathematics is a very fascinating subject.	3.43	0.82	Agree
9. I am willing to take more effort in Mathematics.	3.90	0.84	Agree
10. The problem activities in Mathematics interest me.	3.49	0.91	Agree
<b>Overall Mean</b>	<b>3.52</b>	<b>0.87</b>	<b>Agree</b>

**Note :** 4.20-5.00 Strongly Agree 3.40 - 4.19 Agree 2.60 - 3.39 Neutral 1.80 - 2.59 Disagree 1.00 - 1.79 Strongly Disagree

In the same table, the highest indicator, *I am willing to take more effort in Mathematics*. It has a Mean of 3.90, with SD=0.84, which is described as Agree and interpreted as High level. This means that the eagerness of the students to learn Mathematics concepts as high as they were willing to study and understand them. One of the important factors to consider in learning any subject is its willingness to accept challenges and explore new things even if it has uncertainties and are difficult. The fact that these students showed willingness should inspire teachers to provide the best learning experience to these students so that their outlook toward the subject will not wane.

Possessing the aptitude and eagerness to learn facilitates learning as well as expedites job search and opportunities. It aids in developing the best approaches and acquiring crucial knowledge essential to performance and development. Anyone can demonstrate the behavior of commitment to learning, regardless of background. Gaining additional responsibility at school requires demonstrating effective learning and a willingness to advance one's abilities and knowledge (Hinkley, 2021).

Meanwhile, the lowest indicator, *I enjoy Mathematics class than in any other class*. It has a Mean of 3.20, SD=0.93, which is described as Neutral and interpreted as a Moderate level. This means that students have less enjoyment and excitement in attending Mathematics classes and activities. This implies that Mathematics classes continue to be the least favorite session being participated by students. This is because oftentimes, the topics are challenging, and usually, the mood of the class is serious. Thus, students feel bored and, at the same time, challenged. Thus, teachers handling this subject must incorporate activities and strategies to make the teaching and learning process fun and exciting (Oco, 2022).

Table 3 presents data on students' Strategies in learning Mathematics. It has Overall Mean of 3.56, with SD=0.89, which is described as Agree and interpreted as High. This means that the students have a high level of strategies used in learning Mathematics. This implies that learning Mathematics is always challenging for students as there are many aspects that need to be tackled and learned to have a better understanding and appreciation of the subject. This is why students employ various strategies in learning as they also realize the importance of the subject in the academe and in real-life situations.

Mathematics, in contrast to other subjects, reinforces itself. Without a solid grasp of the earlier materials, a student cannot proceed. And this makes learning Mathematics a challenge. Students need to do more than just drill multiplication tables and memorize formulas if they want to succeed in Arithmetic. They must fully comprehend the meaning of their arithmetic teachings and how they apply to everyday life. Students need a range of instructional techniques to get to that higher level of knowledge (Crowe, 2021).

**Table 3**

*Students' Level of Study Habits on Strategies in Learning Mathematics*

Indicators	Mean	SD	Description
1. I can read and understand the majority of content found in my Mathematics textbook/ Module.	3.36	0.87	Neutral
2. I can reword the majority of Mathematics content in my textbook into my own words.	3.20	0.88	Neutral
3. If I have a question, I can use my textbook to help me find an answer to my question.	3.59	0.87	Agree
4. Reading over the lesson before we discuss it helps me understand the lesson better.	3.74	0.90	Agree
5. I ask more knowledgeable questions after reading the Mathematics topic.	3.51	0.83	Agree
6. I can understand Mathematics through reading my textbook/ Module.	3.15	0.89	Neutral
7. I enjoy sharing my thoughts and observations during class discussions.	3.50	0.93	Agree
8. I feel confident in my abilities in Mathematics.	3.21	0.83	Neutral
9. I contribute to class discussions in my Mathematics class.	3.64	0.87	Agree
10. I often participate in class-solving activities.	3.14	0.85	Neutral
11. I listen to my classmates' ideas, and I also share mine.	3.55	0.88	Agree
12. I can adjust to any partner or group that I will be assigned with.	3.54	0.93	Agree
13. I listen and analyze my groupmates' opinions.	3.63	0.90	Agree
14. I make sure that heated arguments are avoided during group sharing.	3.46	0.94	Agree
15. I focus my attention on my teacher's discussions and questions.	4.07	0.93	Agree
16. I make sure that I contribute meaningfully on my group's outputs.	3.79	0.95	Agree
<b>Overall Mean</b>	<b>3.51</b>	<b>0.89</b>	<b>Agree</b>

Note: 4.20-5.00 Strongly Agree 3.40 - 4.19 Agree 2.60 - 3.39 Neutra 1.80 - 2.59 Disagree 1.00 - 1.79 Strongly Disagree

In the same table, the highest indicator, *I focus my attention on my teacher's discussions and questions*. It has a Mean of 4.07, with SD=0.93, which is described as Agree and interpreted as High. This means that during the teaching and learning process, the students listen carefully to the teachers' discussion. Thus, teachers must prepare strategies and activities that will continue to attract the interest of the students.

This means that utilizing a set of strategies and activities must be in accordance with the needs and kind of learners. It must also get aligned with the standard set on that particular competency so that learners will not get confused as they go on with the lesson. Enriquez (2020) claimed that teachers value their jobs highly and make sure that they do not mess up. They always treat everyone with respect and professionalism. Even learners that are minors are treated with respect by providing strategies and activities that are best suited to them as well.

Meanwhile, the lowest indicator, *I often participate in class-solving activities*. It has a Mean of 3.14, with SD=0.85, which is described as Neutral and interpreted as a Moderate level. This means that the students

have difficulty participating in the teaching and learning process in Mathematics. Thus, teachers should have equal treatment to students and avoid favoritism.

This data means that teachers should perform excellently in maintaining learning that promotes fairness, equality, motivation, and inspiration. Teachers should ensure that the students are in a learning environment where they can hone their knowledge and skills at the same level as their classmates without being judged unfairly or treated unequally. Ampo (2022) claimed that students that are motivated and inspired work hard to attain the highest level of learning especially when they are evaluated and treated equally. Teachers should always apply fairness and equality in the dealings of their learners and in making their comments and evaluations.

Table 4 discloses the student's overall level of Study Habits associated with learning Mathematics. It has an Overall Mean of 3.50, with SD=0.88, which is described as Agree and interpreted as High level. This means that the students were able to achieve second highest level of study habits associated with learning Mathematics. This implies that teachers should provide better learning activities to students in order to improve their learning experience and performance. The impact of the teacher on the student's impression of learning Mathematics and its study habits is crucial. Thus, teachers should not take this lightly.

**Table 4**

*Students' Overall Study Habits*

<b>Variables</b>	<b>Mean</b>	<b>SD</b>	<b>Description</b>
Attitude	3.47	0.88	Agree
Confidence	3.52	0.87	Agree
Strategies in Learning Mathematics	3.51	0.89	Agree
<b>Overall Mean</b>	<b>3.50</b>	<b>0.88</b>	<b>Agree</b>

Note: 4.20-5.00 Strongly Agree 3.40 - 4.19 Agree 2.60 - 3.39 Neutra 1.80 - 2.59 Disagree 1.00 - 1.79 Strongly Disagree

The focus of the teacher will alter how one studies. Effective instruction can improve one's study habits when all four of its components, like knowledge, understanding, application, and skill, are met. Some educators promote memorizing, while others stress the importance of learning via comprehension rather than memorization. As a result, both a student and a teacher contribute to the development of study habits. The methods that teachers use to teach are distinctive. As a result, a student chooses a certain strategy for a given class. The student is just like the teacher (Janubas, 2022).

**3.2 Level of Performance in Mathematics**

Table 5 shows the Students' level of performance in Mathematics. It has an Overall Mean of 89.13, with SD=4.73, which is interpreted as Very Satisfactory. Moreover, sixty-nine (69) out of two hundred thirty-one (231) of the students got the scores at outstanding level, one hundred-four (104) out of two hundred thirty-one (231) of the students got the scores at very satisfactory level, forty-two (42) out of two hundred thirty-one (231) of the students got the scores at satisfactory level and sixteen (16) out of two hundred thirty-one (231) of the students got the scores at fairly satisfactory level. This means that the students achieved the second highest performance level in Mathematics.

**Table 5**

*Students' Performance in Mathematics*

<b>Level of Performance</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
Outstanding	69	30	89.13	4.73	Very Satisfactory
Very Satisfactory	104	45			
Satisfactory	42	18			
Fairly Satisfactory	16	7			

Did not Meet Expectation	0	0
<b>Total</b>	<b>231</b>	<b>100.00</b>

**Note:** 90%-100% Outstanding 85%-89% Very Satisfactory 80%-84% Satisfactory  
75%-79% Fairly Satisfactory 74% and Below Did not Meet Expectations

Performance in Mathematics for students is crucial to their success and learning development. It will allow them to develop higher-order skills that can also be applied in other learning areas. Mathematics is a very important subject. Therefore, mastery and understanding of its concepts are a must for students. One of the most crucial disciplines in daily life is Mathematics. It is crucial in the technological age.

Mathematical expertise is essential for navigating the mechanical world and adapting to rapidly evolving information technologies. The mother of all sciences is Mathematics. Nothing in the world is possible without a basic understanding of Mathematics. Without Mathematics, the world cannot advance. Moreover, Mathematics satisfies most human requirements relating to various facets of daily life (Bartle, 2020). Therefore, concepts in Mathematics must be mastered by students, and teachers may provide assistance like remedial activities and provision of other learning materials like worksheets, etc. Jamis (2022) agreed and further stressed that there are topics in Mathematics that require ample time to be fully mastered and learned by the students. Therefore, teachers must emphasize this by learning strategies or interventions in order to make the teaching and learning process in Mathematics interesting and fun for the learners.

Guinocor (2020) study revealed that students' learning modes differ. However, with assistance given to students, they could still achieve higher Mathematics performance. Yeh (2019) revealed that helping low-achieving students was beneficial. They perform much better performance after assistance is given. Retention levels also increased along with the Mathematics scores.

Moreover, the research results of Ullah (2018) and Armenta (2019) revealed that providing assistance like remedial classes to students have posted valuable and significant improvements on students' achievements and performance. Therefore, initiatives like this can be of great help to struggling learners or students. This can lead to better study habits and performance among students.

### 3.3 Relationship between Factors Affecting mathematics Learning and Performance

Table 6 exhibits the Test correlation between Students' Study Habits and Performance in Mathematics. In terms of Attitude, it has a computed r-value of 0.9132 with p-value=0.000 with the description of a strong positive relationship and is significant at 0.05 level of significance. This means that a significant relationship was registered between study habits like attitude towards students' Mathematics performance. Thus, the null hypothesis is rejected.

This means that study habits such as attitude have a significant relationship to the learning performance of the students in Mathematics. Students are still very young and considered children; therefore, they must be given priority, attention, and assistance as they are still in their teenage developmental stage. This stage is crucial as this is the transition of the child's well-being from young to adult.

**Table 6**

*Test correlation of Students' Study Habits and Performance in Mathematics*

Study Habits	Academic Performance			Interpretation
	r-value	p-value	Description	
Attitude	0.9132	0.000	Strong Positive Relationship	Significant
Confidence	0.0184	0.7573	No Linear Relationship	Not Significant
Strategies in Learning Mathematics	0.8279	0.000	Strong Positive Relationship	Significant

**Note:** \*significant at p<0.05 alpha level

S – significant

NS – not significant

*r-Values Description*

*r-Values*

*Description*

0.00 – 0.09 No Linear Relationship (NLR)

0.10 – 0.49

Weak Positive Relationship (WPR)

0.50 – 0.69 Moderate Positive Relationship (MPR)

0.70 – 0.99

Strong Positive Relationship (SPR)

1.00- Perfect Linear Relationship (PLR)

Independent of variables like a child's IQ, a positive attitude toward Mathematics improves the brain's memory region and predicts Mathematics achievement. Even after statistically controlling for working

memory, Mathematics anxiety, general anxiety, and overall attitude toward academics, Mathematics performance still connected with a favorable attitude toward Mathematics. Children who had negative attitudes toward Mathematics tended to perform poorly in the subject, whereas those who had favorable attitudes varied in their levels of Mathematics proficiency (Digitale, 2018).

In terms of Self-Confidence, it has the computed r-value of 0.0184 with p-value=0.7573, which is described as no linear relationship and is not significant at 0.05 level of significance. This means that no significant relationship was registered between students' self-confidence on learning towards their performance Mathematics. Thus, the null hypothesis is accepted. This means that self-confidence have no bearing on the students' performance in Mathematics. This only show that indeed self-confidence is not enough for the students to learn and have high performance in Mathematics. They need other study habits in order to succeed in learning and studying Mathematics.

In terms of Strategies in Learning Mathematics, has the computed r-value of 0.8279 with p-value=0.000 with the description of strong positive relationship and is significant at 0.05 level of significance. This means that there is a significant relationship between students' strategies in learning Mathematics towards their performance. Thus, the null hypothesis is rejected. This means that strategies in learning Mathematics of students have a significant relationship to their performance in Mathematics. This only show that various strategies in learning the subjects can result in better performance in Mathematics. They need more study strategies in order to succeed in learning and studying Mathematics.

Students are still very young and considered children; therefore, they must be given priority, attention, and assistance as they are still in their teenage developmental stage. This stage is crucial as this is the transition of the child's well-being from young to adult. Thus, teachers and parents must re-enforce difficulties and struggles in learning development, especially in reading. Instilling a love for Mathematics provides the students a head starts on developing their independence and motivation. In addition to helping develop social-emotional skills and, of course, creativity, it aids in their learning to make sense of both the physical world and other people (George, 2019).

Moreover, instead of having to speak in front of the entire class, some students find that speaking in small groups makes them feel safer and more at ease. They have the chance to feel more comfortable discussing their ideas through collaborative activities. This tactic enhances students' speaking and listening abilities in addition to helping them develop their social skills. Each student gains knowledge from their partner when brainstorming. As they learn new terms from their peers and build on their past knowledge, this can aid children in growing their skills in Mathematics (Cowling, 2021).

#### **4. CONCLUSION**

The primary purpose of this study was to investigate the factors associated with Mathematics performance and its relation to the student's level of Mathematics performance during the First Quarter of the School Year 2022-2023. The participants were the selected Grade 10 Junior High School students at Agusan National High School in the division of Cagayan de Oro City. The independent variable of this study is students' study habits in terms of attitudes, self-confidence, and learning strategies in learning Mathematics. The dependent variable of this study is the students' Mathematics performance based on their First Quarter grades in Mathematics for School Year 2022 – 2023.

The findings of the study would contribute to the awareness and understanding of the following individuals: This study will serve as a guide for school leaders to help teachers improve through the provision of appropriate training and seminars on strategies for teaching Mathematics. The teachers would determine the learning strategy and in assisting students in developing better study habits and strategies in Mathematics. The learners will benefit the most from this study because they will have the opportunity to understand study habits and learning strategies, which will help them improve their Mathematics Performance. This could be used as a starting point or reference for future scholars interested in conducting similar research with wider coverage and variables.

Based on the findings of this study, the following are concluded: Students have a very positive attitude toward their study habits when learning Mathematics. Students felt that studying and learning Mathematics was essential. Students' success and academic growth depend heavily on their Mathematics performance.it is essential for pupils to master and comprehend its concepts. Students' study habits in terms of attitudes have an impact on how they learn Mathematics.

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The study pointed out suggestions and recommendations: 1. The students need to consider Attitudes specifically on their way of thinking or feeling about studying Mathematics lessons as reflected in one's behavior. Teachers must reinforce motivational activities to encourage students to love Mathematics. 2. School administrators may hold training for teachers on ways to develop their teaching style that will improve the performance of the students in Mathematics. 3. For the proficiency of students in Mathematics, the school must consider necessary materials, resources, a variety of activities, and customized teaching to meet the educational needs of the learners.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

### REFERENCES

1. Acharya, Bed Raj (2017). Factors Affecting Difficulties in Learning Mathematics by Mathematics Learners, *International Journal of Elementary Education*. Volume 6, Issue 2, April 2017 , pp. 8-15. doi: 10.11648/j.ijeeedu.20170602.11
2. Ampo, J. (2022). Learned Competencies In English, Mathematics, Filipino And Araling Panlipunan Areas Of Grade 2 Pupils In Sta. Ana Elementary School, District Of Tagoloan. Unpublished Research. Cagayan de Oro City, Philippines
3. Ares, K. (2022). Learned Competencies and Academic Performance of Students at Tagoloan District. Unpublished Research. Cagayan de Oro City, Philippines
4. Armenta, Z. (2019). Effects on the presence of tutorials in the academic performance of the administration students of a university north of Mexico. GSJ Publication. www.gsj.com
5. Bacomo, A.C.C., Daculap, L. P., Ocampo, M.G.O., Pagua, C.D., Pentang, J.T., Bautista, R.M., Modular Learning Efficiency: Learner's Attitude and Performance Towards Self-Learning Modules, pp. 60 – 72. <https://philarchive.org/>
6. Bartle, M. (2020). Importance of Mathematics. <https://www.bartleby.com/>
7. Capuno Reyhan, Renante Necesario, Jonathan Olores Etcuban, Raymond Espina, Gengen Padillo , Ramil Manguilimotan. (2019). Attitudes, Study Habits, and Academic Performance of Junior High School Students in Mathematics. <https://doi.org/10.29333/iejme/5768>
8. Çiftçi, S. Koza; Yildiz, Pinar. (2019). The Effect of Self-Confidence on Mathematics Achievement: The Metaanalysis of Trends in International Mathematics and Science Study (TIMSS). <https://eric.ed.gov/>
9. Cowling, Tania. (2021). How to Use the Think-Pair-Share Activity in Your Classroom. <https://www.wgu.edu/>
10. Crowe, Ashley. (2021). Top 9 Math Strategies for Successful Learning (2021 and beyond). <https://www.prodigygame.com/>
11. Dangle, Y. & Sumaoang, J. (2020). The Implementation of Modular Distance Learning in the Philippine Secondary Public Schools. Retrieved 26 October 2021 from <https://www.dpublication.com/wp-content/uploads/2020/11/27-427.pdf>
12. Department of Education Order No. 8, s. 2015. Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program, 2015. [www.deped.gov.ph](http://www.deped.gov.ph)
13. Department of Education Order No. 31, s. 2020. Interim Guidelines for Assessment and Grading in Light of the Basic Education Learning Continuity Plan, 2020. [www.deped.gov.ph](http://www.deped.gov.ph)
14. Digitale, Erin. (2018). Positive Attitude Toward Math Predicts Math Achievement In Kids. <https://med.stanford.edu/>

- 577 15. El Said, Ghada Refaat. (2020). How Did the COVID-19 Pandemic Affect Higher Education  
578 Learning Experience? An Empirical Investigation of Learners' Academic Performance at a  
579 University in a Developing Country. <https://doi.org/10.1155/2021/6649524>
- 580 16. Enriquez, R. (2020). The Use of MELCs in the Normal and its impact on learning of the  
581 learned competencies in core subjects. Unpublished Thesis. Cagayan de Oro College.  
582 Carmen, Cagayan de Oro City, Philippines
- 583 17. George, Carol Anne. (2019). Why Read?. <https://www.rochester.edu/>
- 584 18. Ghosh, Pragati. (2020). Short Essay on Attitude. <https://www.shareyouressays.com/>
- 585 19. Guinocor, M. (2020). Math Performance of Students in a Philippine State University.  
586 *IEJME*, 15(3). <https://doi.org/10.29333/iejme/7859>
- 587 20. Hinkley, A. (2021). Why is Willingness to Learn Important. <https://www.edfenergy.com/>
- 588 21. Hosein, Anesa and Jamie Harle. (2018). The relationship between students' prior  
589 mathematical attainment, knowledge and confidence on their self-assessment accuracy,  
590 *Studies in Educational Evaluation*. <https://doi.org/10.1016/j.stueduc.2017.10.008>
- 591 22. Jamis, Matela S. (2022). Impact of Pocket Tutorial on the Academic Performance of  
592 Grade 9 Students in Mathematics. A Research Study. Misamis Oriental, Philippines
- 593 23. Janubas, I. (2022). The Impact of Modular Distance Learning Approaches on Students'  
594 Academic Achievement. Research Paper. DepEd Division of Lanao del Norte, Philippines
- 595 24. Jerivic, Jania, Brezavšček, Alenka, Gregor Rus, and Anja Žnidaršič. (2020). "Factors  
596 Influencing Mathematics Achievement of University Students of Social  
597 Sciences" *Mathematics* 8, no. 12: 2134. <https://doi.org/10.3390/math8122134>
- 598 25. Lee, J., Solomon, M., Stead, T. *et al.* Impact of COVID-19 on the mental health of US  
599 college students. *BMC Psychol* 9, 95 (2021). <https://doi.org/10.1186/s40359-021-00598-3>
- 600 26. Lightner, J., Tomaswick, L. (2017). Active Learning – Think, Pair, Share. Kent State  
601 University Center for Teaching and Learning. <https://www.kent.edu/ctl/think-pair-share>
- 602 27. Location Map of Agusan National High School. <http://bitly.ws/yuxq>
- 603 28. Mazana, M. Y., Montero, C. S., & Casmir, R. O. (2019). Investigating Students' Attitude  
604 towards Learning Mathematics. *International Electronic Journal of Mathematics  
605 Education*, 14(1), 207-231. <https://doi.org/10.29333/iejme/3997>
- 606 29. McKay, T. (2016). Assessing the Impact of Tutors on First Year Academic Performance at  
607 a South African University. South Africa. *Researchgate Publications* (9).  
608 <https://www.researchgate.net>
- 609 30. McLeod, Saul. (2019). *What are Independent and Dependent Variables?*  
610 <https://www.simplypsychology.org/variables.html>
- 611 31. Mcleod, S. (2017). Behaviorist Approach. *SP Journal Publications*, (10). Retrieved from  
612 <https://www.simplypsychology.org>
- 613 32. Mind, Richards. (2020). The Very Real Benefits of Reading Bedtime Stories.  
614 <https://www.sclhealth.org/>
- 615 33. Morin, Amy. (2022). How to Be More Confident: 9 Tips That Work.  
616 <https://www.verywellmind.com/>
- 617 34. Namocatcat, Angie O. (2021). *Parallel and Non-Parallel Sessions (PNPS): Reinforcing  
618 MDL in Providing Much Better Learning Environment for Mathematics*. A Research Study.  
619 Misamis Oriental, Philippines
- 620 35. Naungayan, R. (2022, February 4). Attitude towards Mathematics and Mathematics  
621 Achievement of Secondary School Learners in Banayoyo-Lidlidda District. *Puissant*, 3,  
622 395-407. Retrieved from [//puissant.stepacademic.net/puissant/article/view/89](https://puissant.stepacademic.net/puissant/article/view/89)
- 623 36. Nagar, Magen N. (2017). The Effects of Learning Strategies On Mathematical Literacy: A  
624 Comparison Between Lower And Higher Achieving Countries. *International Journal of  
625 Research in Education and Science (IJRES)*, 2(2), 306-321.

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673  
674

37. Nicolas, Cherry Ann T. and Charlyn Y. Emata. (2018). An Integrative Approach through Reading Comprehension to Enhance Problem Solving Skills of Grade 7 Mathematics Students. <https://openjournals.library.sydney.edu.au/>

38. Ngware, M. (2019). School effectiveness and academic performance in low-resourced urban settings in Kenya. <https://doi.org/10.1080/03004279.2019.1705372>

39. Oco, Richard M. (2022). Learners' Learning, Performance and Appreciation Towards Teacher Made Math Module with Across Curriculum Integration EOI : [10.11216/gsj.2022.05.74643](https://doi.org/10.11216/gsj.2022.05.74643)

40. Oco, Richard M. (2022). Student's Exposure on Synchronous-Asynchronous-Tutorial Aided Distance Learning: Impact on Academic Performance in Mathematics EOI: [10.11216/gsj.2022.01.57745](https://doi.org/10.11216/gsj.2022.01.57745)

41. Oco, Richard M. (2022). Impact of F-A-T Strategies on Level of Problem-Solving Skills among STE and RBEC Students: A Comparative Study EOI : [10.11230/ieeesem.2022.02.29580](https://doi.org/10.11230/ieeesem.2022.02.29580)

42. Oco, Richard M., Quirap, Erlinda A., Florendo, Mary Issa Grace B. (2022). Inner Disposition and Social Formation of Junior High School Students towards Corporal Works of Mercy. *International Journal of Science and Research (IJSR)*. DOI : [10.21275/SR22308181914](https://doi.org/10.21275/SR22308181914)

43. Odutayo, A. (2017). Effects of Peer Tutoring on Students' Academic Performance in Ilorin South, Nigeria. *Journal of Peer Learning*, 10(1). <https://files.eric.ed.gov/fulltext/EJ1147960>

44. Park, Kyungmee. (2020). The Role Of Mathematics In The Overall Curriculum. <https://www.mathunion.org/>

45. Peteros, E. (2019). Factors that Affects Mathematics Performance of Junior High School Students. *IEJME*, 15(1). <https://doi.org/10.29333/iejme/5938>

46. Quigley, Alex. (2021). Does Reading \*Really\* Matter In Mathematics?

47. Raba, A. (2017) The Influence of Think-Pair-Share (TPS) on Improving Students' Oral Communication Skills in EFL Classrooms. *Creative Education*, 8, 12-23. doi: 10.4236/ce.2017.81002.

48. Schwab, Klaus. (2018). The Global Competitiveness Report 2017–2018. <https://www3.weforum.org/>

49. Shanahan, Timothy (2020). Why Think-Pair-Share. <https://www.readingrockets.org/>

50. Sihombing, Sabrina O. (2018). Empirical Results of Predicting the Relationship between Value, Attitude, and Intention to Quit as an Entrepreneur. [www.researchgate.net](http://www.researchgate.net)

51. Simonson, Shai and Fernando Gouvea. (2020). How to Read Mathematics. <https://web.stonehill.edu/>

52. Singh, V., Gopal, R. & Aggarwal, A. Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID 19. *Educ Inf Technol* 26, 6923–6947 (2021). <https://doi.org/10.1007/s10639-021-10523-1>

53. Stones, Stella. (2020). Benefits of Supplemental Reading Programs. <https://steppingstonesogether.com/>

54. Tuananay, Narlaila. (2019). The Advantages And Disadvantages Of Think-Pair Share And Jigsaw In Teaching Writing Skill. <http://jurnal.iaknambon.ac.id/>

55. Ugwu, Eucharika Okwudilichukwu. (2019). Effect of Student Teams-Achievement Divisions and Think–Pair–Share on Students' Interest in Reading Comprehension. <https://doi.org/10.5590/JERAP.2019.09.1.22>

56. Ullah, I. (2018). Effects of Tutoring on the Academic Achievement of Students at Secondary Level. *ResearchGate Publications*, 10(2). <https://www.researchgate.net>

57. Waters, Shonna. (2022). Improve your life with a new outlook: 10 benefits of positive thinking. <https://www.betterup.com/>

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58. Zulaikha, Mohd Basar, Mansor, A., Jamaludin, K., & Alias, B. (2021). The Effectiveness and Challenges of Online Learning for Secondary School Students – A Case Study. *Asian Journal Of University Education*, 17(3), 119-129. doi:10.24191/ajue.v17i3.14514
59. Yeh, C. (2019). Enhancing Achievement and Interest in Mathematics Through math-illand. *RPTEL* 14, 5. <https://doi.org/10.1186/s41039-019-0100-9>
60. Yusuf, Qismullah; Jusoh, Zalina; Yusuf, Yunisrina Qismullah. (2019). Cooperative Learning Strategies to Enhance Writing Skills among Second Language Learners. <https://eric.ed.gov/?id=EJ1201198>
61. Zhang, J. (2019). Relationship Between Math Anxiety and Math Performance: Meta-Analytic Investigation. *Frontiers in Psychology*, 10. <https://doi.org/10.3389/fpsyg.2019.01613>