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Study Habits and Engagement as Determinants of Students' Mathematics Achievement

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Abstract: The purpose of this study was to explain the relationship between study habits, student engagement and mathematics achievement amongst Grade 7 students in Tisa National High School during first quarter of 2025-2026 academic year. Based on Self-Regulated Learning Theory, Student Engagement Theory and Constructivist Learning Theory, the study used a descriptive correlational design. Two hundred and ninety-three were randomly sampled and assessed using researcher-developed questionnaires that measured study habits, levels of engagement, and mathematical achievement. Although the study habits of the students were found to be good and they were highly engaged in their studies, their average achievement in mathematics was just satisfactory with only a few outstanding results. Statistical tests showed that there were no significant relationships amid study habits, engagement and mathematics achievement. These results indicate that although good studying habits and positive involvement are essential elements, they are not sufficient factors on performance in mathematics. There are other situational and individual determinants that seem to greatly influence the performance of students in the subject. The study shows the complexity of mathematics education, its possibilities and constraints. Notably, the study proposes a more fine-grained perspective on the mathematical difficulties of students, which should not be reduced to either exertion effort or enthusiasm. Rather, it lays stress on the importance of long-term guidance, caring tutoring, and multi-faceted support systems that nurture confidence as well as ability in students. Such a comprehensive view recognizes the complexity of education development and the variability of student needs in learning processes.

Keywords: Teaching Mathematics study habits, student engagement, cognitive, behavioral, emotional, Grade 7, mathematics achievement and correlational, Cebu City, Philippines.

Rationale of the Study

One of the practices in Cebu Technological University (CTU) and the Department of Education (DepEd) is learning enhancement. It emphasizes the power of offering effective study and engagement channels to learners to increase academic outcomes. In Mathematics the University employs the principle of learning through doing, and promotes exploration, discovery and construction of knowledge through personal experience. The strategy aligns with the core values, mission and vision of CTU. The Learning Enhancement Program comprises of achieving independent, analytical, and lifelong learners; individuals who will be able to apply the concepts they learn at school in order to solve real-world problems.

COVID-19 pandemic has created a paradigm shock to the system of global education because it has created a swift transition process within the system of global education in the effort to exhaust the old system of global education, which is classroom based and instead replace it with virtual learning environments. The hysterical re-building of learning environments has ushered in a major decline of instructional mastery particularly on students. This has been a sustainable dilapidation because of poor equality in use of digital materials, teacher support and asymmetrical availability to internet. This has given rise to the distorted curriculum development whose foundation is the prerequisite conceptuality development which has given rise to serious leeway to cognitive development of the learners. Mathematics is threaded throughout our life (Puracan et al., 2023).

The nationwide results of the 2022 PISA showed that only 16 percent of Filipino students had achieved mathematical baseline proficiency Level 2 in mathematics, in comparison with the average performance on mathematics of 69 by the OECD. This places Philippines in the bracket of lowest performing nations in the evaluation. Mathematics is a general-academic field that is instructed in modern tertiary and secondary schools. In the bigger hierarchy of subjects it falls in the category of core subjects, mastering of which helps students build a solid ground of learning, as well as application in the real life. More precisely, formidable understanding of mathematical concepts develops reasoning and analytical skills, which could be even further applied beyond the school setting, encouraging academic achievement in the future studies, career growth, and solution to real life problems of mathematical nature. Offering a systematic framework to examine phenomena through, mathematics gives learners more depth in understanding the world in which they live. There is a general consensus that mathematics is a key area that supports core cognitive skills, especially logical reasoning, thinking and problem solving. The main purpose of mathematical training is to support and motivate learners to gain confidence in using the subject in the systematic characterization and solution of real-world problem scenarios (Mazana, 2020).

Despite all of these, many students consider math as a difficult subject. According to Stanley (2021), Some children excel in subjects such as problem- solving, geometry and numeracy, yet some have such difficulties learning math, that they are overwhelmed, frustrated, or anxious when anything to do with math is required. One of the biggest reasons why students find math hard is because they do not understand its value in real life. This attitude becomes harder to shake off when students are about to start high school math, which is more theory-based. Hence, it is important that students have to focus on learning the subject, one of these is to develop good study habits, such as maintaining consistency in their learning and engaging with the material both within and beyond the classroom. This can vastly improve the student's comprehension and problem-solving skills, assuring them with their capabilities of understanding the given challenge. Therefore, making the students more prepared to undertake and recognize the significance of mathematics in daily lives and future professions. Laptops and phones are by no means the sole distractors during lessons and there are numerous ways in which students can engage in off-task behaviors that do not necessitate the need of a computer or a smartphone (e.g. chatting with others students, etc.) (Jamet, 2020). These are some of the challenges that have been posed to those Mathematics teachers who have a responsibility of coming up with strategies that can help them to ensure that the students are not only listening to them about the lessons but also become in a position to be able to utilize it in their lives.

Pedagogical-engagement and academic-achievement of students are negatively impacted by student disengagement behaviors in the classroom, which include disruptive, off-task, and sometimes aggressive behaviors. Among the aspects of this phenomenon that are important in experience, there is digital distraction; as Flanigan (2020) explains, this kind of distraction influences the way instructors make decisions and establish relationships with students considerably and negatively affects instructor job satisfaction. A combination of such factors as degree of engagement, subject interest, study habits, learning variations and socioeconomic conditions then contribute to bad performance. As it has been repeatedly mentioned by Trends in International Mathematics and Science Study (TIMMS), the Philippine archipelago is well known in its long-term poor performance in international mathematics exams. It was also demonstrated

that in the 2018 Programme for International Student Assessment (PISA), the Philippines ranked the second decreasing in the field of Mathematics nation focuses (Department of Education, 2019). According to DepEd Order No. 31, S. 2012, Elementary Mathematics is the concepts and ideas, skills and processes applied in the field of numbers and number sense (non-geometric), measurements, patterns and algebra, probability and statistics and application of appropriate technology in terms of developing critical thinking, solving problems, inquiry, reasoning, communication, and connection making, representation, and decision in the real world context.

In the field of mathematical education, the skills implied in the reasoning form of logic, problem solution and critical thinking is viewed to be every vital in coming up with the most best decision making and problem solving skills. It is thus imperative to gauge the learning activities of students and their engagement in the learning content since those two aspects may be directly related to academic achievement. Students, who demonstrate an inability to stimulate mathematical concepts and adopt negative learning patterns and are mildly interested in the discipline, can hardly develop analytical behavior in performing any task. Through the systematic study of these dimensions, teachers can diagnose their area gaps at a relatively tender age and recruit some educational aid so that they can support learning and enhancement of knowledge in the field of mathematics. It is confirmed by the analysis that mathematics skills have positive and statistically significant correlations with the performance of students (Tus, 2020). To add on to the KASH (Knowledge, Attitude, Skills, and Habits) Model approach, a sub-optimal performance cannot only be discussed in terms of knowledge and skill deficiency but also by poor attitudes and poor behavior habits.

In the Philippines, at Cebu City, there is a tendency of students being less interested in mathematics because of the poor experiences they have experienced in the past. The researcher posit that there is a substantial correlation between levels of interest in mathematics and academic achievement, and in this study, the researcher attempt to uncover the relevant factors that contribute to this correlation. Although some children excel in areas such as problem-solving, geometry and numeracy, others experience great difficulties in mastering math that they feel overwhelmed, frustrated or feel anxious whenever it concerns the math field. According to empirical evidence, teachers in the field of mathematics are progressively using pedagogical approaches with the aim to make the discipline more presentable and friendly to the students.

The implementation of technology-based evaluation tools in the classroom set up is one of such strategies. However, in spite of the efforts to make mathematical operations less complicated (simplification of complicated equations, use of various teaching aids etc.) a considerable percentage of students has shown minimal interest to the subject of mathematics. Some learners control the phones during the lessons talking with each other, using the phone or showing the signs of attention and sleepiness.

This disengagement in behaviour is often shown in low quiz score that will be achieved after the lesson. These findings point to the importance of addressing student study skills and engagement which are of great influence on how they perform in mathematics. Further, the identified phenomena are significantly stronger in the context of mathematics learning in the Philippines where the national curriculum is implemented along the spiral. In this context new concepts in mathematics are not just freely hands on but essentially are developed on what has already been learned; hence, being unable to acquire prerequisite skills and competencies foretells the failure of acquiring later ones.

In response to this need, this paper will evaluate the study skills, the level of study habits, engagement and the performance of the students of mathematics in grade 7 during the first quarter of the academic year 2025-2026. The findings of the research and the action plan of the teacher will be helpful to the Math teachers in the school, and also to other Government-established Junior high Schools as it will provide a fine insight and knowledge on the effective strategies that can be employed to enable the student learn Mathematics better at the secondary level.

Theoretical Background of the Study

The given investigation falls between three premise frameworks, i.e. Self-Regulated Learning Theory of Zimmerman (1989), Student Engagement Theory of Blumenfeld and Paris (2004), and Constructivist Learning Theory of Piaget (1936).

Self-Regulated Learning Theory The formulation proposed by Zimmerman (1989) places greater emphasis on the autonomy that must be assumed by the learners, that is, setting the goals, monitoring the progress and reflecting critically. Working data shows that those students who exemplify good planning, seeking feedback and evaluation of their studies are more likely to achieve higher academic results. Habits of study serve in this context as a decisive apparatus: the ability to plan, regularly evaluate knowledge acquisition, and correctly solve the routine assigned tasks are the basic self-regulatory skills.

Blumenfeld and Paris (2004) theory of student engagement, conceptualizes on the integration of the behavioral participation, emotional involvement and cognitive investment. With demonstrable interests of sustained interest, students develop more propensities of attention in classrooms, appropriate questions and endurance in the face of intellectual stimulation which is very important in mathematical environments. It can therefore be argued that the capacity to engage can not only improve the learning performance, but also strengthen the efficacy of the study habits. Constructivist Learning Theory A constructivist theory defined by Piaget (1936) points to the active process of knowledge-building that comes about

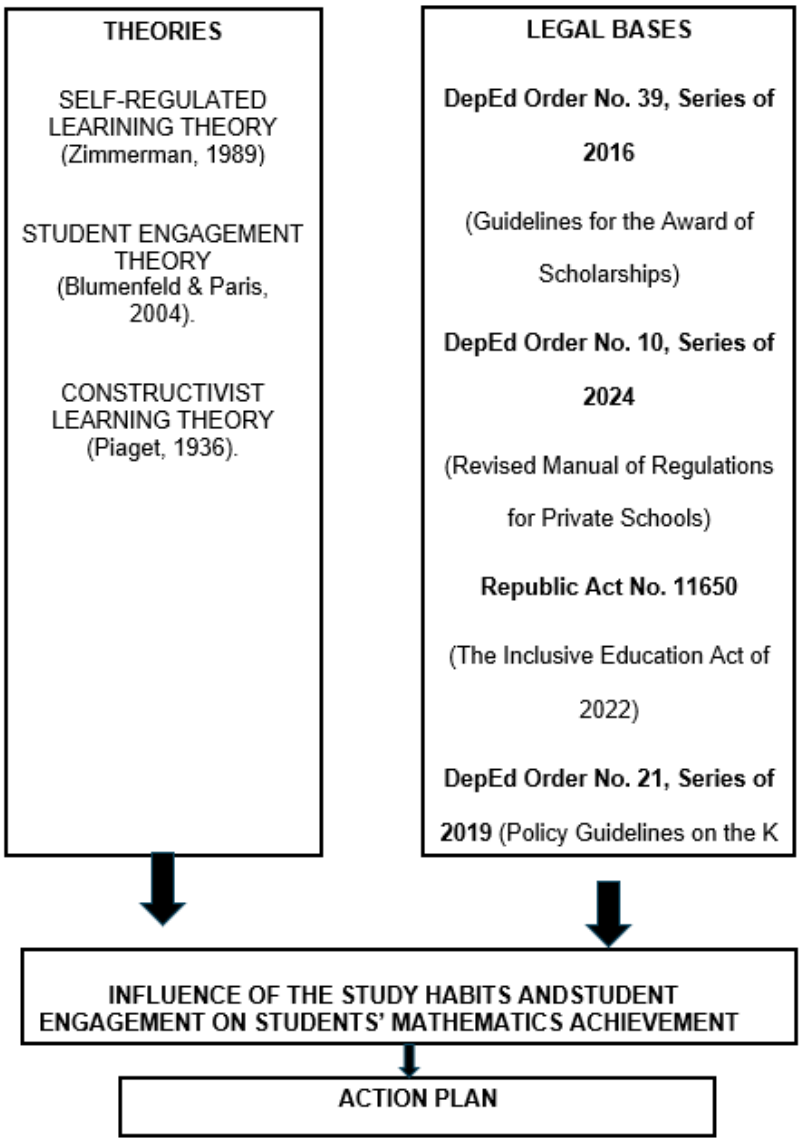

Figure 1. Theoretical/Conceptual Framework of the Study

as a result of making contact with the environment. Such a view is used in mathematics contexts to emphasize discovery of problems and pattern recognition, as well as development of conceptual links. Not only can such experiential learning foster profound conceptual learning but, also, it effectively parallels the development of effective study skills.

Summing up, both of these theoretical perspectives combined help to explain the relationship between the study habits and the engagement of the students and, consequently, the overall influence of these two factors to the achievement of mathematics. Such findings are in tandem to the policy stipulations of the Republic Act No. 10533 (the Enhanced Basic Education Act of 2013) that formalizes the education system that currently operates in the Philippines and specifically entails the need to promote learner centered operations, encouragement of the critical thinking process, and the delivery of lifelong learning to become the long-term patterns of development that depend on the self-regulating people and individual endurance.

In DepEd Order No. 21, series of 2019 which gives guidelines on the policies of the K to 12 Basic Education Program, there is inevitability regarding pedagogical practices that bring students more into the learning process. The paper supports the theme of making a learning relevant and interactive to enable relevant classrooms where students engage actively in their study. Concomitantly, the regulative framework of examining the role of study habits and engagement that determines the outcomes with regards to learning mathematics is presented by the Department of Education Act of 2013 which is organic reproduction of the Regulations of the 2011 Philippine Basic Education Act.

D.O. No. 39, s. 2016 is titled "Guidelines for the Award of Scholarships to Qualified Recipients of the Expanded Student Financial Assistance Program (ESFAP) in Private Higher Education Institutions (HIEs) for School Year (SY) 2016-2017". This policy focuses on financial assistance and scholarships, so it does not directly align with the learning theories (Self-Regulated Learning, Student Engagement, Constructivist Learning) in your study's original framework.

D.O. No. 10, s. 2024 is titled "Revised Manual of Regulations for Private Schools (RMORPS) in Basic Education". This order provides a comprehensive regulatory framework for private schools. Aspects of this order might indirectly relate to the conditions that foster the learning theories in your study (e.g., regulations on curriculum delivery or learning environments).

The collection of actions, tactics, and practices that can facilitate and facilitate learning could be called study habits. Bashir and Mattoo (2012) note that the routines having a direct effect on academics include time management, concentration, note-taking system, and reading techniques.

According to Ogbodo (2010), study skills are the necessary learning tools with counseling implications in boosting the performance of a student. At the same time, Osa-Edoh and Alutu (2012) demonstrate that students who have constant revision and design of a positive studying environment display above average academic performance particularly in mathematics.

As Odiri (2015) explains, their results indicated that there was a significantly positive association between study behaviour and maths performance since learners who adopt a disciplined and consistent study behaviour perform above peers. This complementing of the achievement motivation and the study habits is supported by Daniel (2015) regarding mathematical performance.

The past researches are also related to engagement- which is considered as the academic self-efficacy and motivation which are considered as a predictor of academic outcome. Engagement can be seen as multidimensional, i.e., based on behavioral, affective, cognitive dimensions, and limited to how students behave, feel, think about the learning environment (Ciric and Jovanovic, 2016; Do, 2015). Researchers then demonstrate the impact of study-habit quality on the performance in mathematics as significant (Sakirudeen and Sanni, 2017).

In fact, Francis Fung et al. (2018) confirm that cognitive or behavioral participation anticipates better results in mathematics, notifying the importance of the teaching strategies promoting

intellectual and participatory abilities of students. This statement is supported by Salami and Spangenberg (2025) who proved that the involvement in problem-solving affects mathematics achievement directly.

There is continued evidence that study habits mediate study of mathematics achievement. The study by Capuno et al. (2019) examining attitudes and study habits observed in junior-high-school students revealed that productive study habits have a positive effect on the achievement of math. Namalata (2024) also acknowledges that the study skills serve as presenting items in which disruptive behavior is mediated, hence improving engagement and performance in mathematical studies. Similarly, a study by Grande and Edig (2024) validates the mediatory role of study habits towards the learning strategies-student engagement relationship contending that the ideal habits are associated with the best mathematics performance.

Other researches have supported these findings. To assess cognitive, affective, and behavioral engagement in 1,000 students studying in secondary-schools in Malaysia, Maamin, Maat, and Iksan (2022) concluded that there were significant relationships between these three dimensions and mathematics performance indicating the effectiveness of school-based initiatives that promote engagement. According to Kausar, Saqib, and Ashrafs (2024), there are notable correlations between cognitive, social, emotional engagement, and mathematics achievement, so it is advised to use engagement-based interventions to improve learning performance.

Sen (2022) addressed the issue of the relationship between the learning styles and the attitudes towards math and revealed that there was, indeed, a significant correlation between the learning styles and interest in math-however, the attitude could not be similarly correlated or related-thus demonstrating that metacognitive and strategic approaches to learning were relevant to math engagement.

Balan and Jonsson (2025) present empirical support on how self-instruction and self-regulated learning materials increases engagement therefore improving the performance in mathematics. Gonzaga-Domider and Dalayap (2025) corroborate such conclusions with the help of structural equation modeling by showing that engagement can significantly alleviate the impediments in the subject of General Mathematics and further the academic performance.

Collectively, the studies give a good foundation of study habits, student engagement and achieved mathematics where mathematics achievement, student engagement and study habits are all dependent constructs. Such a framework is used to build research instruments, gather the data, and conduct analytical procedures and thereby contribute to the streamlining of the learning process and the teaching experience. Lastly, the literature indicates that advanced quantities of engagement with mathematics through improved study skills, self-regulation and active participation is essential to math achievement.

The proposed study on the study habits and level of engagement among students in grade 7 will also coincide with the educational policies, namely Republic Act No. 10533 (Enhanced Basic Education Act of 2013) and other policies of the departments of education, to be precise, DepEd Order No. 8, s. 2015 (Policy Guidelines on Classroom Assessment) and DepEd Order No. 21, s. 2019 (Policy Guidelines on the K to 12 Basic Education Program). All the legal instruments highlighted the need to build positive learning behavior, active learning, and participation in an equal opportunity of achieving academic achievements. The said analysis of the relationship between study habits and engagement, and mathematical achievement, as established by study therefore promotes the above mandates as it generates evidence based findings pertaining to the practices that can promote achievement in a key subject.

Besides that, the study aligns with the programmatic drive of DepEd to enhance learning outcomes through specific interventions and the teaching informed by assessments. As the study habits and participation of students are tracked, the outputs give an image of what has to be prioritized about and what should be worked upon in the current academic practice. This opinion supports Provisions of RA 10533 and defines the idea of curriculum as the learner centered

developmentally appropriate and capable to unlock the full potential of the learner. Not only this, the empirical results will aid in the process of fine-tuning the instructional methods in the manner that classroom activities actively engage students and give them a chance to learn themselves, which is a central value of DepEd Order No. 8, s. 2015.

The recommendations of the study based on time management, note-taking, test preparation, and class participation all directly relate to the goals and objectives of DepEd to develop 21 st century skills and to equip students with lifelong learning. The question of the study is able to investigate both the behavioral and cognitive aspects of learning, thus validating the policy agenda of enhancing teaching performance, responsiveness to the needs of the learners, and the maintenance of interest in mathematics, which is one of the key elements of the K to 12 curriculum.

THE PROBLEM

Statement of the Problem

This research assessed the study habits, student engagement, and mathematics achievement of the Grade 7 students for the school year 2025-2026 as a basis for action plans.

Specifically, this study sought to answer the following queries:

1. What is the level of study habits of the respondents?
2. What is the level of engagement of the respondents in learning Mathematics in terms of:

2.1 Cognitive engagement,

2.2 Behavioral engagement, and

2.3 Emotional engagement?

3. What is the level of mathematics achievement of the respondents?
4. Is there a significant relationship between the:

4.1 respondents' study habits and their mathematics achievement,

4.2 engagement and their mathematics achievement?

5. What action plan would it be possible to suggest based upon the findings?

Statement of the Null Hypothesis

Based on the objectives of the study described, the null hypotheses under study in the level of significance 0.05 are the following ones:

Ho_1: There is no significant relationship between the respondents' study habits and their mathematics achievement.

Ho_2: There is no significant relationship between the respondents' engagement and their mathematics achievement.

Significance of the study

The current work attempts to cater to the interests of the following academic groups:

Department of Education. This investigation brings a stringent study of the effectiveness of K to 12 policies that focus on the worrying area of elementary to high school transition.

School Administrators. The results would provide administrators principals and curricular coordinators with empirical findings that they could use to base their targeted academic efforts and resource allocation.

Math Teachers. The study will be able to visualize the academic achievement, learning habits, and literacy skills of the incoming students in Grade 7, and this will offer a basis of differentiation instruction, creating lesson sequencing, and lesson closure strategies to overcome the learning gap in the first year of study.

Students. The main aim of the study is to facilitate teaching practices that are sensitive to the preparedness of students in academic areas. The research enables schools to provide greater strategic advice and to maximize student performance by explaining both prevalent barriers and accruing benefit regarding Grade 7.

Researcher. The work provides contributions to the literature on transition studies in education, mathematical literacy, and formative assessment. It provides a comparative guide to future research on learner prep, learning efficiency, and how academic needs in junior high schools are managed.

Future Researchers. The results have both conceptual and empirical context for studies in these fields and surrounding fields such as comparative studies, small scale comparative or longitudinal inquiries, or explores and looks into inclusive education and various kinds of differentiated instructional design.

RESEARCH METHODOLOGY

The current methodology outlined procedures and methods that would be used in analyzing study habits and engagement as the factors of mathematics achievement among students in Grade 7. A study design used structured survey questionnaire on the study habits of the students, their engagement and work achievement in mathematics. A stratified random strategy was used to select participants so as to represent equally all sections of Grade 7.

Design

Based on descriptive-correlational research design, this study project aims at explaining the correlation that exists between the study habits and academic engagement of students and their achievements in mathematics. In line with the exposition by Creswell (2009), the descriptive-correlational design is adopted when there is a need to describe how a phenomenon exists and at the same time analyze how variables are related to each other without manipulating any of them. The existing study, thus, provides a reasonable research design to assess the correlation between study habits and engagement in learning and mathematics performance among seventh-grade students of Tisa National High School (Day).

The descriptive dimension aims at describing the existing levels of every variable. Questionnaires will be used to collect quantitative information and express the study habits of the students (e.g., Good, High), engagement (quantitative gradings) and will document the general spread of these indicative scales by using qualitative indicators like mean scores. At the same time school records will be analyzed to determine the mathematics achievement scores distribution. The set of descriptive results combined allows to outline the present tendencies in the development of learning attitudes and behaviour of students in the classroom.

The correlational element of the design entails quantification of the statistical correlation of the independent variables (habits and engagement studying) and dependent variable (achievement in mathematics). The study will also establish the relationship between variations in the study habit and engagement and variations in mathematics performance through Spearman correlation of the rho. Such an analytic approach will allow potential positive, negative, or no relationships to be identified without making any assumptions of causation.

Flow of the Study

This paper looked at the study/engagement habits, and the achievement of mathematics of Grade 7 students of Tisa National High School (Day), Cebu City Division, in the 2025 2026 school year. The results were used to provide evidence-based approaches to the improvement of mathematics learning and performance. The study examines the level to which respondent profiles which include the age, gender of the student and overall performance determine the effect of these factors besides the study habits of students as well as academic involvement on mathematics achievement.

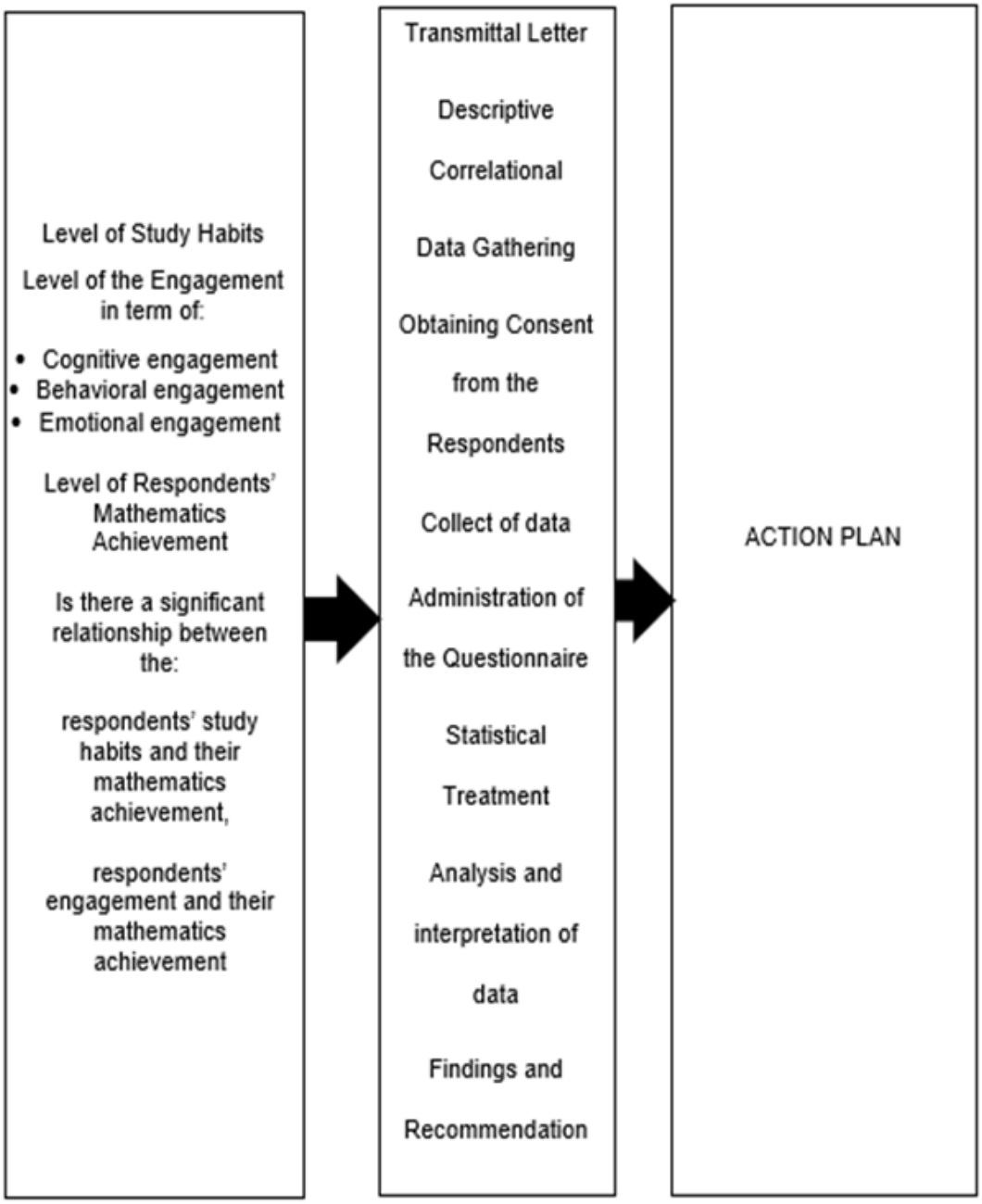

Figure 2. The flow of the study

The analysis measures dimensions of study habits and test preparation combined with dimensions of engagement (cognitive level, behavioral level and affective level) and tests the null hypothesis that there is no significant correlation between these and mathematics achievement, by carrying out statistical analysis in the investigation. The descriptive- correlational design is a combination of descriptive statistics that are used to illustrate the current situation with regard to study habits, engagement and achievement and correlational analysis that is used to establish connection amongst the variables. The study habit/engagement data are obtained through a validated survey tool with supplemental school records in terms of mathematical scores.

The outcome of this study is important to several stakeholders, such as the Department of Education, the administrators in schools, mathematics teachers, students, parents, and researchers. It is the aim of shaping instructional choices and promoting learner-support approaches and mathematics instruction. The research is based on the principles of self-regulated learning theory, constructivist learning theory, and ecological systems theory to explain that learning is the result of the interaction of the personal behaviors, classroom, and environmental factors.

The results showed how teachers play a crucial role in developing an effective course of studying and maintaining interest in the process, whereas recognizing that these things alone do not fully predict differences in academic performance. The research has added value to educational scholarship in explaining how much the study habits and propensity of engagement can explain mathematics achievement and the question of where supplementary interventions might still be important, as well as practical ideas on how to improve teaching and learning in mathematics.

Environment

The monograph was distributed in Tisa National High School, a diversified public secondary school which is subordinate to the Department of Education in the Division of Cebu City. The school, located at the F. Llamas Street corner with commercial centres and the Tisa Barangay Hall in Tisa, Cebu City, has been serving the neighbourhoods including Punta Princesa, Labangon and Buhisan with over ten years of service to the children.

Previously known as Tisa 1 Elementary School, the school had expanded to offer, in 2003, a night high-school programme to the working students. A comprehensive secondary programme was established in 2008 and in 2015 the school was issued a license under the Tisa National High School with the approval of local government and the national Department of Education. School now has both junior and senior high school with about 3,000 pupils and 121 teaching staff serving towards the holistic development of learners.

With the school slogan, Molding Characters, Shaping Minds, this will be carried under the school mission statement, Molding Characters, Shaping Minds. Tisa National High School aims at turning out graduates, who are not only good

Figure 3. Location Map of the Research Environment

academically, but also in sports and development of skills and in leadership in the process of fulfilling their mission in, Where Every Learner Counts. This mandate is related to the Department of Education agenda of producing all-round and responsible citizens.

Since successful performance and continued participation are key to success especially in mathematics, the school facilitates positive learning conditions supported by an organized environment. To inculcate self-discipline, time management and the inclination to participant in classroom activities, teachers use a variety of classroom regimens, performance-checking devices and lesson delivery techniques. They include school-based programmes such as remedial classes, peer-tutoring and academic enrichment programmes, which take care of individual learning needs. The idea behind these practices is the development of independent learning abilities and the willing of the students to take responsibility over the course of their academic achievement.

The current study examined the level of study habits and engagement among the Grade 7 students and the potential relationship between the study habits and engagement and their achievement on mathematics performance. It is done in order to decide on whether every learner has enough direction, resources, and hence opportunities to excel at school and in life.

Respondents

The respondents of this study were the Grade 7 students of Tisa National High School (Day), a public educational institution under the Department of Education in the Cebu City Division. This school was chosen as the focus of the research due to its unique educational setting, which serves a diverse population through both junior and senior high school programs.

Tisa National High School was selected as the respondent pool for several reasons. First, as my workplace, it provides me with first-hand experience and insight into the academic behaviors, engagement patterns, and learning challenges of students, particularly in mathematics. This personal connection allows for a deeper understanding of the study habits and engagement levels of the learners and a genuine commitment to helping improve their academic outcomes.

Additionally, the convenience of conducting the study within my workplace ensures accessibility, efficiency in data collection, and the ability to observe students' behaviors in their natural learning environment. The choice of Grade 7 students is deliberate, as this stage marks a critical transition from elementary to secondary education a period when study habits and engagement patterns begin to solidify and significantly impact future academic performance.

Table 1. Distribution of the Respondents

Name of Sections	N	n	%
A	42	21	10.88
B	43	21	10.88
C	50	25	12.95
D	50	25	12.95
E	50	25	12.95
F	50	25	12.95
G	50	25	12.95
H	50	25	12.95
Total	393	193	100

The results given by the distribution data in Table 1 show that there are 385 students enrolled in Grade 7 at Tisa National High School (Day) and among them, there were 193 respondents who participated in the research. Sample size was determined according to the Raosoft sample size calculator at a 95% margin of error and a 5% level of confidence thus ensuring that the inferences would be statistically significant and depict the complete Grade 7 lot.

This sampling technique provided a wide range of views representing the whole Grade 7 so that the study of habits, level of engagement, and mathematics performance could be evaluated well.

The inclusion of the respondents of different backgrounds and academic positions helped the study to be more aligned to predict the patterns and possible associations between learning behavior and related performance.

The emphasis on the Grade 7 participants is especially relevant because that is the time of transition between elementary and secondary life education, which means that the way of studying and learning techniques becomes fixed and has great impact upon achievement. The results obtained on this sample should help offer actionable information that can help teachers and school leaders create specific interventions to reinforce study habits, maintain engagement, and end results that enhance mathematics performance at multiple levels across the grade level.

Instrument

The study shall used a structured questionnaire with the help of two already validated tools, Study Habits in Mathematics questionnaire developed by Charles-Organ and Alamina (2014) and Student Engagement in Mathematics questionnaire devised by Maamin, Maat, and Iksan (2021), to aid in answering the research objectives. The right to include these scales was secured by means of formal correspondence submitted to the original authors (see Appendix with letters of request). The two instruments were selected because they have been proved to be reliable as well as they directly apply to the objectives of the study.

The questionnaire contains three parts:

Part I. This first section gathers purely demographic information, such as age, gender, and what grade one is in mathematics. These are variables that provide a scenario when explaining results, and also the trends or disparities within the subgroups.

Part II. Excerpted into a section by Charles-Organ and Alamina (2014), the instrument develops upon measuring key study habits in mathematics, that of time management, taking and reviewing notes, assignment completion, and test preparation. The prevalence of these behaviours is captured by a five point Likert scale (Always, Often, Sometimes, Rarely, Never).

Part III. This part, adapted by Maamaim, Maat et al. (2021), measures three engagement aspects in mathematics, including cognitive engagement (complexity of focus, persistence, and effort), behavioral engagement (participation, attendance, and task compliance), and affective engagement (interest, motivation, and enjoyment). A five point Likert scale (Strongly Agree to Strongly Disagree) is used in recording responses. The presence of these two confirmed tools to ensure the capturing of the magnitude of both study habits and engagement which are the main independent variables. In the process of adapting, small edits were made to enhance clarity and to make it contextual to Grade 7 students in Tisa National High School (Day). Pilot study will be embarked upon before full deployment to ensure that the combined instrument yields reliable and valid data that will be subjected to statistical analysis later.

Data Gathering Procedure

Preliminary Stage. The first phase starts with the researcher seeking permission by the Office of the Superintendent to conduct a study. When the researcher receives the approval, he/she fixes consultation appointments with the respondents and implements the protocol of the investigation.

Data Gathering Stage. The researcher will initiate an orientation on the scheduled day about the research. The importance of the purpose of the study cannot be underestimated, and it is necessary to emphasize the value of participation and procedure, protecting and discussing the confidentiality of the respondents in the study. Provision of the survey questionnaires will be immediately after the orientation. There will be instructions on how to fill the survey questionnaires. The team will also provide assistance as the respondents fill out the survey questionnaires and a reasonable amount of time will be allowed to do so. The survey of the questionnaires will be retrieved.

Post-Data Gathering Stage. In the current research, the researcher makes careful counts, tabulation, summarization, interpretation, and analysis of the data obtained. The data is treated by using statistically adequate methods. A course of action is then suggested to address the needs of students at Tisa National High School with respect to enhancing study habits, engagement and performance in mathematics.

Statistical Treatment of Data

To address the research objectives, the data gathered were carefully organized and analyzed using appropriate statistical methods:

Frequency Count. This tool will be used to determine the number of responses under each category of the survey items. It will help identify how frequently particular study habits and engagement behaviors are reported by the respondents.

Percentage. This tool will be used to convert the frequency counts into percentage values, giving a clearer picture of the distribution of responses across different categories.

Weighted Mean. This tool is used to find the average level of students' study habits and participation in mathematics. This provided a general idea of how students typically behaved based on various measures.

Standard Deviation. This tool is used to measure how much students' answers varied from each other. A larger number indicated that students' answers were more diverse, while a smaller number stated that they were more similar.

Spearman's Rho Correlation. This tool is used to check if there was a link and how strong it was between study habits, student participation, and math achievement. This method was chosen because it works well for ordered scores and does not need the data to be spread out in any special way. The results were evaluated to determine their significance using a standard test level ($p < 0.05$).

Ethical Consideration

The integrity of the moral undertaking of any research project- particular those that utilize students and teachers- should be entire throughout. A necessary effect is obtaining informed consent of all the participants and as in the case where people are under age, their parents or legal guardians. The subjects need to be made categorically aware that they can quit the study at any moment without penalty. Moreover, anonymity and confidentiality will also be emphasized through the use of pseudonyms, the safe storage of data, and the removal of the identification data in any report or publication. In order to reduce the possible harms, sensitive material will be treated respectfully, support opportunities will be put in place where needed, and the investigator will not waste the time and work capacity of the participants. The ethical conduct will be strengthened by its clear reportages, fair selection, and treatment of study subjects as well as compliance with institutional and regulatory requirements and that of the approving review board of studies in research.

The study also fits the ethical principle of beneficence since it provides a knowledge base that can enhance the study behaviors and engagement of students in mathematics thus leading to better academic record. Justice is guaranteed by equal in distribution of the benefits and burdens of the study carried out to the participants. Conflicts of interest that may exist or indeed emerge will be declared and the findings used positively as a way of improving other than stigmatizing. Using such ethical guidelines, the study will mitigate the rights and well-being of all the participants, enhance trust, and the resulting knowledge that will have a meaningful contribution to the learning experiences of math learners.

Scoring Procedure

The scores can be described as an organised process of analysing data, which creates quantitative indices that describe the habits of the students, their engagement and their academic achievements

in mathematics. With a combination of well-developed questionnaires and a regular scoring procedure, the study aims to raise evidence-based ideas about the approaches that could improve study behaviors, engage them more, and, in turn, better mathematics outcomes.

Scoring procedure on the indicators of Study Habits

Scale 5 (Numerical Rating 4.21–5.00, Descriptive Rating Excellent): Respondents consistently show positive practices and attitudes toward their study habits in mathematics.

Scale 4 (Numerical Rating 3.41–4.20, Descriptive Rating Very Good): Respondents generally display favorable study habits in mathematics. Most of the time, they engage in practices that support their learning, although there may be occasional lapses.

Scale 3 (Numerical Rating 2.61–3.40, Descriptive Rating Good): Respondents sometimes demonstrate effective study habits in mathematics. Their approaches to studying may vary, with a balance between helpful and less effective behaviors.

Scale 2 (Numerical Rating 1.81–2.60, Descriptive Rating Fair): Respondents seldom exhibit productive study habits in mathematics. There are more instances where effective strategies are not consistently applied.

Scale 1 (Numerical Rating 1.00–1.80, Descriptive Rating Poor): Respondents rarely show positive study behaviors in mathematics. Their responses suggest that helpful study habits are largely absent in their routine.

Scoring Procedure on the Level of Perception of the Respondents Towards Student Engagement in Mathematics

Scale 5 (Numerical Rating 4.21–5.00, Descriptive Rating Very High): Responses indicate that students are highly involved, attentive, and invested in learning mathematics. They frequently participate, show strong interest, and demonstrate consistent effort in their math activities.

Scale 4 (Numerical Rating 3.41–4.20, Descriptive Rating High): Students generally show positive involvement and interest in mathematics. They often participate and put effort into learning, though there may be occasional fluctuations in their engagement.

Scale 3 (Numerical Rating 2.61–3.40, Descriptive Rating Moderate): Engagement in mathematics is moderate. Students sometimes participate and show interest, but their involvement and effort are not consistent.

Scale 2 (Numerical Rating 1.81–2.60, Descriptive Rating Low): Students rarely show active involvement or sustained interest in mathematics. Participation and effort are infrequent, and engagement is generally low.

Scale 1 (Numerical Rating 1.00–1.80, Descriptive Rating Very Low): Responses suggest that students almost never engage with mathematics. There is minimal to no participation, interest, or effort in learning activities.

Mathematics Achievement In- Items Rating Scale

Scoring Range 33–40 (Outstanding): Demonstrates a superior and exceptional grasp of mathematical concepts and skills.

Scoring Range 25–32 (Very Satisfactory): Shows a high level of proficiency and understanding in mathematics.

Scoring Range 17–24 (Satisfactory): Exhibits a foundational understanding and an acceptable level of performance in mathematics.

Scoring Range 9–16 (Fairly Satisfactory): Displays a developing understanding of mathematical concepts, requiring some further development and support.

DEFINITION OF TERMS

In order to give clarity to the terms used in this study, the following are operationally defined:

Action Plan. Structured series of activities or interventions, predicated on empirical research, which aim to improve students study involvement and success in mathematics. It outlines what interventions, when and who will do it.

Behavioral Engagement. The manifestations of the behavioral component are noticeable activities and involvement in the educational activities school tending, homework, and classroom adherence to the rules.

Cognitive Engagement. That which involves the psychological input and personal readiness to work with interpreting and mastering the complicated material, such as mathematical problem solving and problematic thinking.

Emotional Engagement. Emotional disposition toward learning, attachment to the school and emotional responses when performing school work (interests, enjoyment, nervousness etc.).

Mathematics Achievement. Marks achieved on the mathematics achievement test which was administered as part of the study and which is based on the test grades and is representative of knowledge of the main mathematical concepts.

Study Habits. The habits and habits that one takes during school life such as management of time, use of notes, goal setting, the preparation of exams All this can affect school performance and participation.

Study Engagement. Engagement in the learning process both behavioral, cognitive and affective sides of this concept and the measure of the extent in which the students are effectively engaged in the academic activities.

Chapter 2

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

The study set forth in this chapter was conducted in a grade 7 data collection at Tisa National High School (Day) located in Cebu City. The research involved examination of the habits of the students in studying, the engagement levels in mathematics and how these factors are related to mathematics achievement. The sample included 193 students in Grade 7 who were day students representing at least two sections, thus painting a complete picture of studying behaviors and learning interaction in a very dynamic educational set-up.

The research questions were answered using the descriptive statistics, i.e., frequencies and percentages, that were used to profile the respondents (age, gender, and academic standing). To estimate the overall study habits of the respondents, the frequency and rank of each indicator of study habit and amount of test-preparation measures were examined. Students given visual inspection in parallel analyses on indicators of interest in mathematics were included in behavioral, emotional, and cognitive engagement. The overall levels of study habits and engagement were measured quantitatively and the relationships between the variables and the levels of achievement in mathematics were investigated through a correlation analysis. The implication of these findings is discussed in terms of enhancing instructional strategies, intervention planning and designing and also student achievement in mathematics.

LEVEL OF STUDY HABITS OF THE RESPONDENTS

Grade 7 students study behavior analysis is made available. Some of the indicators will be time management, organizational competence, and keeping with the study routine. These indicators are shown in the following tables.

Study habits are the routine and approaches that are undertaken by the students to prepare and accomplish academic assignments. Examples of such habits are setting aside a particular time to

study, properly sorting and preparing the materials to learn, going over already-read material frequently, and avoiding distraction when studying.

Table 2
Level of study habits of the respondents

S/N	Indicators	WM	SD	Verbal Description
1	I consider mathematics notwithstanding when I am incredibly drained.	3.25	1.16	Good
2	I examine mathematics first by deciding what topic to contemplate.	3.57	1.06	Very Good
3	I study math for around 50 minutes and afterward take around ten minutes break before beginning once more.	3.24	1.21	Good
4	I always practice mathematics with a textbook.	3.31	1.33	Good
5	I consider mathematics with a friend(s), test one another, share any useful info and foresee test questions.	3.55	1.17	Very Good
6	In taking care of an issue, I give much consideration to subtleties.	3.37	1.17	Good
7	I think about mathematics for a long stretch without respect to my timetable.	2.88	1.21	Good
8	I feel good when I solve mathematics problems by myself.	3.61	1.27	Very Good
9	I study mathematics with a high level of concentration.	3.32	1.19	Good
	Aggregate Weighted Mean	**3.34**		**Good**
	Aggregate Standard Deviation		**1.20**	

Legend: 4.21-5.00-Excellent; 3.41-4.20-Very Good; 2.61-3.40-Good; 1.81-2.60-Fair; 1.00-1.80-Poor

These habits would depend on the quality of the motivation of students, their self control and recognition of good learning practices. The current research has therefore noted the degree to which the respondents have displayed study habits and the results are presented in Table 2.

The results in Table 2 indicated that the response to the Azure mentioned in the study Habits of Information gathering about the mathematics of the students in Grade 7 is moderately to highly effective, with an average weight of 3.34, which can be correlated with the descriptive category of Good. Those items with the highest weighted means, i.e. “I feel good in case I solve a mathematics problem by myself” (WM = 3.61), I examine mathematics in the first place by planning what mathematics topic to think about” (WM = 3.57) and I think about mathematics with a friend/friends, quiz each other, discuss any information that can help and even anticipate test questions (WM = 3.55) were rated Very Good. These results confirm the tendency of students to self-dependence, systematic planning, and collective learning, three practices that are linked to enhanced problem-solving rates and exhibited in-depth understanding of the subjects.

On the other hand, the item with the lowest positive covariate WM = 2.88, I think about mathematics quite a long stretch without.regard to my schedule that lies in the Good domain but indicates the necessity of a higher level of sustained attention without excessive reliance on time-scaffoldings. The indicators related to time management (e.g., I use brief breaks between study sessions, WM = 3.24; I train with the textbooks, WM = 3.31) received Good ratings as well, which means that such indicators are present but not highly observed.

The highly enterprising scores in collaborative study and the relatively low scores in time management could be explained by the early-adolescent level of development of the respondents where regular study habits are only in the formation stage. According to Corpuz (2024), and Charles-Organ & Alamina (2014), health study skills are developed via practice over time,

support and direction by a teacher and a teaching environment that makes learning favorable. A preference towards collaborative efforts on the part of the students is a good indicator of an interactive direction that was embraced in Tisa National High School. The relatively weak marks on time management, in turn, signal a realistic need of the localized intervention that will be focused on reinforcing the discipline in scheduling and the regular use of the reviewing activities.

Overall, these findings indeed corroborate a positive study habit among Grade 7 mathematics students but still, this also summarizes potential opportunity areas that could be further improved upon. Despite the fact that the students have all the motivation and strategies that are needed to succeed in academics, the evidence highlights the importance of enforcing consistency and self-regulated studies to maximize their efforts.

LEVEL OF ENGAGEMENT OF THE RESPONDENTS IN LEARNING MATHEMATICS

Student engagement refers to the achievement of learners in showing attention, curiosity, interest, passion in the learning processes, and the ability of the learners to demonstrate commitment towards seeking education and academic advancement. There are various variables that have conclusive influence on this construct, such as the study habits of the students, intrinsic and extrinsic motivational orientations, self-efficacy beliefs and the nature of the learning environment. The present research thus comprehensively identified as well as analyzed the engagement levels of the respondents and provided the findings in Table 3, 4 and 5.

Cognitive Engagement

The degree to which the respondents engaged in learning Mathematics in relation to cognitive engagement. This dimension shows what the students think about, how they work and how they approach learning mathematics as shown by their weighted mean scores and respective verbal descriptions.

Table 3
Level of engagement of the respondents in learning Mathematics in terms of cognitive engagement

S/N	Indicators	WM	SD	Verbal Description
1	I relate the things I learn in mathematics to the things I go through in real life.	3.76	1.06	High
2	I relate the things I learn in mathematics to other subjects.	3.54	1.16	High
3	I think about the things I've learned when I learn new things in mathematics.	3.74	1.08	High
4	I prefer to memorize all the formulas necessary to solve mathematics problems.	3.59	1.14	High
5	I find memorizing formulas is the best technique for learning mathematics.	3.66	1.10	High
6	I think the best way to learn mathematics is to try to do drills.	3.68	1.08	High
7	I learn mathematics based on what the teacher teaches.	3.81	1.05	High
8	I solve mathematics problems in the same way taught by the teacher.	3.90	1.01	High
9	I think the best way to learn mathematics is to follow the teacher's instructions.	4.09	1.05	High
	Aggregate Weighted Mean	**3.75**		**High**
	Aggregate Standard Deviation		**1.08**	

Legend: 4.21-5.00-Very High; 3.41-4.20-High; 2.61-3.40-Moderate; 1.81-2.60-Low; 1.00-1.80-Very Low

Based on the analysis of data collected about Tisa National High School in regard to the cognitive engagement of Grade 7 students to mathematics, it is suggestive to say that the general response is a lot of feelings of cognitive engagement to mathematics as the weighted means points to an average of 3.75 among all the students. Given the endorsement of the two highest-rated items--the first being, I think the best way to learn mathematics is to follow the instructions of the teacher (WM = 4.09) and the second, I solve mathematics problems in the same manner taught by the teacher (WM = 3.90) -amplifies a marked preference of the teacher-directed instruction. The same level of tap-off is witnessed in the verbatim: "I apply what I learn with mathematics to what I experience in real life" (WM = 3.76), indicating that students recognize the inherent applicability of the field to real life situations to be significant in maintaining interest and developing understanding.

Conversely, the questions at the bottom of the scale, i.e., I associate what I learn in mathematics with other subjects (WM = 3.54) indicate that, at least when usual practices are concerned, so-called cross-curricular connections do not take place surprisingly frequently. The increased focus on the action of prescribed procedures and lack of interest in the variety of methods suggest a prominent inclination towards ordered guidance, a pattern that could impose limitations on the versatility in problem-solving.

The given results can be supported by the findings provided by Fredricks, Blumenfeld, and Paris (2004), who argue that cognitive engagement could be described as an activity that involves a long-term dedication to learning as well as a willingness to pay attention to the shifts in learning methods. Once students demonstrate their attentiveness, content comprehension skills, and their capability to apply classroom content to real life scenario, the addition of an independent exploration lesson and the use of differentiated problem-solving meanings to instruction should increase adaptability and promote conceptual knowledge within mathematics. It is evidenced that the students in their grade-7 have a high cognitive engagement in mathematics with an average of 3.75 that is weighted. These two highest-scoring indicators, think the best way to learn mathematics is to do what the teacher says or explains (WM = 4.09) and I am doing mathematics problems in the same way the teacher/explains it (WM = 3.90), accentuate a sharp inclination toward teacher-based learning. There is also another strongly positive measure, so-called I relate mathematics to my everyday world (WM = 3.83), meaning that students understand what mathematics can be applied to in everyday life, and perceive it as the vital element of maintaining interest and broadening understanding.

A side-by-side review of the student reporting demonstrates that questions representing a deviation toward non-standard operations, like, I approach mathematical problem solving in a different way as instructed (WM = 3.49), generated lower average ratings as compared to those involving conventional practices. Such findings indicate that even though students are able to successfully perform textbook algorithms, they are inclined to exhibit a relatively low disposition to explore alternative ways of solving problems. This type of orientation to procedural faithfulness over conceptual flexibility fits within a larger mathematical culture of emphasis on certainty of correctness and approved teacher-validated procedures.

Behavioral Engagement

Before we get into the specific findings, it is essential that we first put the discussion into the broader concept of behavioral engagement. This dimension of engagement is about the visible actions and efforts to be learned in response to academic tasks, classroom responsibilities, and opportunities for learning provided for them. It is a measurable indicator of student participation, persistence and interaction in the learning environment providing a basis for understanding how well students relate to the instructional process.

Table 4 shows the findings in regard to behavioral engagement in mathematics among Grade 7 students in Tisa National High School with a total weighted mean of 3.75.

Table 4
Level of engagement of the respondents in learning Mathematics in terms of behavioral engagement

S/N	Indicators	WM	SD	Verbal Description
1	I listen to the mathematics teacher's instructions attentively.	3.95	1.07	High
2	I participated in discussions during the mathematics learning	3.53	1.14	High
3	I focus when the mathematics teacher teaches in the classroom.	3.98	1.12	High
4	I am sure I will get the right answer if I keep trying to solve mathematics problems	3.76	1.09	High
5	I try to use a different method if I continue to not be able to solve the mathematics problem.	3.61	1.12	High
6	I try to understand if there is a problem in mathematics.	3.69	1.09	High
	Aggregate Weighted Mean	**3.75**		**High**
	Aggregate Standard Deviation		**1.10**	

The two strongest-rated school-level indicators, that is, focusing on "I focus when mathematics teacher gives instructions in the classroom" (WM = 3.98) and being attentive to instructions by listening to them in the classroom denotes a high level of attention payed and responsiveness to instructions given. Moreover, the observation of whether there exists a problem in mathematics (WM = 3.89) shows that students overcome challenges to find the answers and, thus, they demonstrate a desire to persist in learning.

Even though the overall scores on students mathematical self-efficacy are quite decent, a relatively low rating is evident on the item, I try to consider an alternate procedure in case I still do not manage to solve the mathematics problem (WM = 3.61). This observation shows that, despite the respondents showing a satisfactory degree of commitment, they are inclined to continue with only applying the solutions they have heard before as opposed to introducing new solutions. Therefore, although perseverance is observed, adaptability needs to be strengthened further to add the flexibility of mathematical problem solving.

These findings are congruent with those proposed by Fredricks, Blumenfeld, and Paris (2004), who suggested that cognitive engagement should entail not only the proactive active readiness to work hard but also the ability to learn new strategies. The discussion showed that the cognitive engagement is high among learners in the Tisa National High School as they exhibited attentive responsiveness to the instructional guidance and understanding of real-life relevance. However, their willingness to explore a broader range of methods capable of addressing problems might serve them better as an approach to enhancing their capability of adapting to intellectual challenges.

Affective Engagement

The amount of involvement of the respondents from the following perspective of learning Mathematics of affective engagement. This aspect gauges the emotional response of the students concerning learning mathematics with respect to their weighted average scores and verbal descriptions.

Table 5
Level of engagement of the respondents in learning Mathematics in terms of affective engagement

S/N	Indicators	WM	SD	Verbal Description
1	I am happy to learn mathematics.	3.76	1.09	High
2	I enjoy learning mathematics	3.74	1.18	High
3	I love solving mathematics problems.	3.54	1.20	High
4	I feel happy when I get good mathematics results.	4.10	1.11	High
5	I am satisfied when I get good mathematics results.	4.18	1.01	High
6	I must work hard to get good mathematics results	4.17	1.02	High
	Aggregate Weighted Mean	**3.91**		**High**
	Aggregate Standard Deviation		**1.10**	

A relatively high level of affective engagement is documented in Table 5, and the total weighted average was 3.91. The two items with the highest ratings both keyed on achievement, that is, I am satisfied when I get good mathematics results (WM = 4.18) and I must work hard to get good mathematics results (WM = 4.17), showing that students attribute a lot of significance to achievement and need to be motivated to exert effort. Further confirms the contributor of positive emotional association with attainment in the discipline is the statement: I feel good when I achieve good mathematics results (WM = 4.10).

Indicators of a distinct boundary between intentions to achieve extrinsic rewards and engagement experiences on the items with the lowest rating on the scale of interest in mathematics (e.g., I love solving problems in mathematics; WM = 3.54) suggest that internal engagement involves a personal sense of meaning. Students turn out willing to work hard to have positive results, and the interest in performing the process of problem-solving might be relatively low. As a result, it appears that they are driven not necessarily by the intellectual nature of mathematics but by the wish to achieve performance-related objectives.

The quantitative report shows that level of behavioral and affective interactions in the cohort of the research is very high, which means that it is attentive, persistent and motivated students. Still, more efforts to strengthen flexible problem-solving approaches as well as the intrinsic motivation in mathematics may improve learning outcomes further. According to Fredricks, Blumenfeld, and Paris (2004), engagement has emotional, behavioral, and cognitive dimensions, i.e., increasing intrinsic motivation is strongly connected to increased and deeper engagement.

Table 6
Summary on the level of engagement of the respondents in learning Mathematics

Components	WM	SD	Verbal Description
Cognitive Engagement	3.75	1.08	High
Behavioral Engagement	3.75	1.10	High
Affective Engagement	3.91	1.10	High
Grand Mean	**3.80**		**High**
Grand Standard Deviation		**1.09**	

The results provided in Table 6 indicated that the respondents have sufficient motivation toward mathematics learning. There is a high grand mean score of overall engagement (M = 3.80) and a small grand standard deviation (SD = 1.09). All the components of engagement measured, i.e. Cognitive Engagement (M = 3.75), Behavioral Engagement (M = 3.75), and Affective Engagement (M = 3.91) are in the range of High.

Empirical review shows that the greatest mean score can be adduced to affective engagement, thus reinstating the fact that students have a long-term positive emotional connection and long-term motivation to mathematics. Similarity in both cognitive and behavioral participation also means

that the learners are alert, will continue working, and will participate in learning activities. Taken together, these findings indicate a parsimonious balance between thinking attributions, emotional investment, and tendencies toward persistence with behavior, a configuration that has been linked in prior research with better academic outcomes.

LEVEL OF MATHEMATICS PERFORMANCE OF THE RESPONDENTS

To better judge the academic status of the respondents, their achievements in mathematics theory were divided into five levels of achievement that can be seen in Table 7. This distribution is a mental representation of and a number-based basis for considering the overall competency of students in the subject.

Table 7
Level of Mathematics Performance of the Respondents

Level	Numerical Range	f	%
Outstanding	33-40	2	1.04
Very Satisfactory	25-32	52	26.94
Satisfactory	17-24	86	44.56
Fairly Satisfactory	9-16	49	25.39
Poor	0-8	4	2.07
Total		**193**	**100.00**
Mean		20.52	
St. Dev.		6.03	

The distribution of levels of mathematics achievement is as shown in Table 7. Most of the students (44.56%) record the “Satisfactory” level with 26.94 and 25.39 percent being the second and third categories: these are the “Very Satisfactory” and the “Fairly Satisfactory” rates, respectively. Only the smallest percentage scores an Outstanding, (1.04 percent), and an even tinier group perform at a poor level (2.07 percent). The score means 20.52 and places it in the middle between satisfactory and right near the satisfactory range, whereas the standard deviation of 6.03 indicates moderate dispersion of the achievement.

These results suggest that while the overall performance of learners is amongst the expected range of proficiency, only a limited number of learners are performing at the highest performance band. This pattern is also consistent with studies that emphasize that how students engage, their interest, and their learning habits are associated with their academic achievement especially in mathematics (Hashim et al., 2021). With the behavior and affective engagement levels having already been classed as high, it is fair to expect that targeted interventions, such as enhanced exposure to enriching tasks, development of problem-solving strategies and initiatives which encourage intrinsic motivation might help to move more learners from satisfactory to higher levels of performance.

SIGNIFICANT RELATIONSHIP BETWEEN STUDY HABITS, STUDENT ENGAGEMENT AND MATHEMATICS ACHIEVEMENTOF THE RESPONDENTS

The current evidence looks at the correlation between study habits of the respondents, their participation in some types of learning activities, and their achievement in mathematics. Findings outlined in Table 8 and Table 9 confirm the earlier literatures, that mathematics proficiency is

optimized in cases where learning strategy is systematic coupled with mathematics engagement not being short.

The insignificant relationship that was found between study habits and mathematics achievement in this study (Spearman rho = 0.039, p = 0.589) accords with the results of Calkins (2005), who stated that coefficients below 0.09 characterize a very weak educational relationship that is often insignificant. In the same manner, a study on primary school students showed no significant relationship between study practices and academic performance highlighting the need of outside factors such as teaching quality and student motivation. But the opposite findings are observed in a study made by Omoniyi and Fawehinmi (2025) where proper study skills, such as routinely reviewing materials and managing their time, have shown to be important predictors behind math performance in Nigerian secondary school children. The work of Gumapac et al. (2024) also demonstrated that students with good study skills showed the best performances in mathematics, which reinforced the notion that habitual study abilities can be academically beneficial to a specific situation. These studies demonstrate how the correlation between study habits and mathematics achievement can be radically different regarding context, definitions, and methodology.

Table 9
Test of relationship between the respondents' engagement and their mathematics achievement

Variables	Spearman's rho	Strength of Correlation	p - value	Decision	Remarks
Engagement and Mathematics Achievement	-0.011	Negligible Negative	0.877	Do not reject Ho	Not Significant

*significant at p<0.05 (two-tailed)

A test of the importance of the correlation between engagement and mathematics achievement is reported in Table 9. The Spearman rho = -0.011 with p = 0.877 it is greater than the normal significance of 0.05. As a result, the null hypothesis of no dependence between engagement and mathematics achievement will not be rejected. The significant negative insignificance implies that tolerance regardless of big levels of engagement, engagement does not amount to better achievement in mathematics.

This conclusion is contrary to the previous research According Puracan et al., (2023) the results that connect better study habits and increased participation to academic success. As an example, in the prior research, it was documented that students with regular study habits and actively involved tend to perform better when compared to the rest of the learners. However, the current findings are congruent with the research findings that show that other factors like previous knowledge, effective teaching, mental capacity, or socio-economic surroundings have more effective influence on math achievement.

Overall, the evidence points to the fact that high engagement/adequate study habit respondents but non-independent predictors of mathematics performance is in connection with findings of recent research showing that in a certain set of contexts study habits are not a substantial predictor of mathematics outcome (e.g. in a 2025 research done in applying the survey in southern Philippines secondary schools no significant direct effect on study habits from mathematics performance period but identified other mediating variables (Parental Involvement) (Cabigas & Cabalquinto 2025). Improvement in teaching approaches and the provision of external determinate is hence bound to create a bigger impact in the achievement levels.

Chapter 3

SUMMARY, FINDING, CONCLUSION, AND RECOMMENDATION

This chapter summarized the key findings of the study in which the results of data analysis are combined with the conclusions made and recommendations given. It showed how the practice of study is a modulator of academic performance in students and at the same time in their management of time, maintenance of motivation, and engagement in classroom activities. The discussion allowed one to have a complete picture of what the research implications are, and why they are crucial by introducing discrete components of the findings in a concise way. The conclusions and recommendations were to guide future researches and inform practitioners how to teach, that is, why the chapter connects empirical research with pedagogical content and future interventions which would promote stronger and more appropriate study habits within the course of teaching.

SUMMARY

Good study is a major factor that determines the academic achievement and the efficiency of learning in students as well as their future long-term scholastic success. Poor or uncommon practices may hinder learning and reduce knowledge acquisition, as well as demotivate students and their feelings of self-competency. With time, these shortcomings can present a recurring problem to the learner, the teachers, as well as the parents and therefore may affect the fulfillment of the academic goals. Instilling of good study habits early is thus critical since it teaches self-discipline and also prepares students to the challenges presented by the higher level of study and consequently promotes cognitive interest and interaction. This calls the importance of investigating study behaviors in the learning environment, whereby with systematic instructions, specific courses of action, and frequent evaluation, learning outcomes should be not only higher but also more effective in the educational system.

The current study examines the nature of study habits of students and how it correlates to academic achievement in Tisa National high school Cebu City Division. A sample size of 193 students chosen using the Raosoft sample size calculation represents the total population of 385 with an acceptable 95% confidence level and a margin of error that is 5 percent. The study examines the relationship between the demographic backgrounds of students: age, gender, level of study and their learning behaviour. Also, it investigates the rationality of that influence on the way students learn, manage time, prepare to assessments, and exploit the academic opportunities. The current investigation can be considered as an organized exploration of four major domains including frequency and regularity of studying habits, effectiveness of favorite studying tactics, the organization of study and environmental influences as well as impact of peer variables. The paper will also determine the extent to which academic achievement is related to the study habits thus explaining the potential avenues to intervention and pedagogical improvement. A null hypothesis was tested on the level of significance 0.05 assuming that there is no significant correlation between study habits of the students and their achievement.

FINDING

The positive findings of the study show that the learners have exhibited positive study habits to mathematics. Types of preparatory behavior such as down-rehearsal and gathering necessary materials were the most consistent, suggesting that the students are active and methodical about classwork. Collaborative habits were also clearly evident, with many learners preferring peer discussions, sharing materials and group review sessions in which case they suggest they are good learners within social and interactive environments.

The results further indicate that the students have a positive self-concept in mathematics especially in solving the problem alone. However, sustained engagement for longer periods of time that is sustained and reviewed without machines through regular tests were among the least prepared habits. This pattern represents a tendency to prepare for short term results instead of mastering mathematical concepts on a continuous basis.

When the relationship between study habits, engagement and their performance was analyzed, negligible and statistically insignificant correlations of both these variables was found with mathematics achievement. This suggests that whilst learners are seen in demonstrating mainly good preparation and showing willingness towards participation, these attributes alone do not directly carry over into higher performance results. The results indicated that other factors - including prior knowledge, quality of instruction, learning environment and external support - may be more meaningful in determining mathematics performance.

Overall, the results indicate that the learners have motivation, readiness, and confidence to undertake the mathematical problems on their own. However, there is obvious work to be done around sustaining focus over time, establishing strong review routines and establishing habits of work that will contribute to sustained improvement. An approach to integrated academic support one that provides a high degree of support for study skills along with addressing instructional and environmental factors may produce more substantial gains in mathematics achievement.

CONCLUSION

This study among 193 randomly sampled Grade 7 respondents provides important insights on how demographic factors including age, sex, and socioeconomic background interacts with educational and study habits of students in mathematics. The sample represents a diverse sample with nearly the same ratio of genders, and the relatively high proportion of adolescents in early adolescence, being the period of development characterized by the formation of habitual study behaviour. Despite a high level of inclinations toward mutual cooperation, impeccable preparation, and self-reliant problem-solving, significant space in terms of both prudent time management and long-term involvement is revealed in most respondent cases.

The current analysis suggests the importance of the well-organized study-skills programs, especially focused workshops and the strategies mediated by the teachers, in the development of such competencies as time-management, self-regulated learning, and the independent review. Though intrinsic motivation of students, positive attitudes toward mathematics, and willingness to work both individually and collectively are good initial sources, partial lack of systematic and continuous training in proper study skills may limit the ability of students to maximize academic performance. This finding reveals the necessity of strategic in-class activities that would help develop a rigorous study schedule, strengthen the continuity of practice, and encourage a balance between cooperative and individual efforts.

This paper conducts a prospective review of the cognitive, affective, and motivational characteristics of Grade 7 students and, therefore, evaluates the strengths of the cohort as well as those areas of need that can be addressed. It is composed of aspects pointing to an overall ambition in scholarly performance, a tendency to collaborative learning and a favourable disposition to mathematics in general. The results form a basis upon which a responsive instruction-support plan is to be constructed to further develop the study habits of the students, and in the process reinforce their mathematical competence and facilitate broader academic success.

RECOMMENDATION

The present study suggests that a comprehensive, systematic system of early screening and treatment is a critical step in addressing the negative cycle of study behavior, student engagement and mathematical performance.

The results of the study indicate that the learners have basic study behaviours but require structured support in sustaining their engagement and improving their mathematics performance. In response, an intensive intervention program is advised in order to counteract study routines, enhance cognitive/business behaviour and boost aggregate one spend on a overall resistivity.

First, accessible digital and low-tech learning tools should be provided to learners. The use of Khan Academy, printed review materials and free math drill applications may offer learners

different ways of practicing skills in their own time and in areas where internet access is limited. Regular use of such tools is expected to help the students build independent study routines.

Second, cognitive engagement outcomes might be better by incorporating real-life opportunities into the form of PISA-type problem solving and group work requirements. These activities enable the learner to consider a range of solutions; and apply mathematical thinking to situations in the real world. With teacher scaffolding during the beginning stages, students may gradually gain confidence in solving non-routine tasks.

Third, resilience and persistence in mathematics may be increased by mastery-tracking and recognition activities. Incorporation of progressive goals, certificates of improvement, and monthly learning mastery evaluation encourages students to continue learning when the task gets difficult.

For the affective engagement, games like Kahoot and Prodigy Math can be employed during the enrichment periods to make mathematics less daunting and fun. Small prizes and puzzle-style math contests may also help maintain the motivation that is required, provided that it stays on par with the lesson competencies and MELCs.

Finally, in order to make up for the performance in mathematics, it is suggested to hold remedial and enrichment sessions at least two times per month, complementing the instruction by mastery tracking in the classroom. The incorporation of both MOOE and PTA-supported resources for printing of drills and contextualization of lessons in context of real-life scenarios from the Cebu-based scenario may further strengthen the retention and application of competency.

Chapter 4

OUTPUT OF THE STUDY

This is the proposed action plan that contributed to the further improvement of the interest in studying math and mathematics study skills at TIsa National High school.

Rationale

Identification of students with good performance in the classroom and students that need support in the learning process are among the two functions of the teacher in classroom. Students who do not perform very well in class are often left behind. Because of the schedule that teachers can put on introducing the lessons to the class. However, this approach can act as a barrier to learning especially on the part of learners who are struggling with the area. Mathematics is one of the subjects that students oftentimes underperform in. The complexity of the subjection makes the pupils experience more of a challenge to understand the concepts taught in the classroom discussions as it incorporates a concept of scaffolding that enables students digest information faster. To understand more complicated notions, it is essential to help students to learn essential things about the world of mathematics. Without taking this into consideration failures will take place in that subject. A student with low performance may thus be retained in the event that the performance fails to improve during the next marking period.

Objective

It is hypothesized that following the implementation of this intervention plan the following objectives will be realized:

- To enhance learning habits of Grade 7 students in order to establish systematic and efficient study habits.
- To intensify multidimensional participation in mathematics, by creating cognitive, behavioral and affective participation.
- To increase the general mathematical performance by assisting students with well-placed instructions and motivational.

Scheme of Implementation

The Digital Math Mastery: EdTech-Enhanced Study Habits for PISA Success In order for the proposal to be familiar to all the teachers at the Tisa National Highschool, it would be posted to the principals, guidance coordinators, and all the teachers. The topic of this study is to be given to the teachers before the admission of students on the school. The suggested activities and the matrix of the proposal will be given to the teachers as copies of those biographies.

ACTION PLAN

Areas of Concern	Objectives	Strategies	Persons Involved	Budget	Source of Budget	Time Frame	Expected Outcome	Actual Accomplishment	Remarks
Study Habits (Narrow application of the use of other problem solving techniques).	Enhance the practices of the study using digital expertise.	- Provide Khan Academy practice sets in line with the lesson. - Free mobile math-drill applications (off-line as required).	Teacher of mathematics, students.	No (optional mobile load).	N/A	Weekly	Students establish taught study skill and use of online/offline tools.		Offline may require print-outs where there is no internet.
Cognitive Engagement Mental Work (Depending on the process employed by the teacher).	To learn to think on your own/advance diverse solutions.	- Math-PISA-style problems once per week. - Group tasks involving the comparison of how various solution methods work.	Teacher of mathematics, students.	₱500 (to print PISA items, using MOOE of school).	School MOOE	Weekly	Students solve real life problems in more than one approach.		Requires the assistance of the teacher initially.
Behavioral Engagement (Low persistence problem solving).	More resilience when dealing with problematic issues.	- Khan Academy mastery goals planned through online challenge quizzes - Awards to regular streaks of practice - "Retrain/ ARAL sessions" to re-solve difficult issues in another manner.	Teacher of mathematics, students.	₱300 300 (certificates, out of teachers funds).	Teacher's personal fund	Monthly	Students do not give up or stop when they see challenging math tasks.		Low-tech options required when students do not have gadgets.
Affective Engagement (Low enjoyment of math).	To make mathematics less boring and less alien.	- Integrate the game-based applications (Prodigy Math, Kahoot) during enrichment. - Small rewards, mini-contests in mathematics (monthly) in puzzle	Teacher of mathematics, students.	₱500 (tokens/prizes).	School MOOE	Monthly	students will be more interested and enjoy mathematics.		There is a need to balance fun with the lessons objectives.

		form. - Problems in real-life contextualized to Cebu (budgeting, shopping, transport time, etc.).							
Mathematics Achievement (Most of them in "Satisfactory" level).	To increase the performance to be nearer to Very Satisfactory.	- Two times per month remedial and enrichment carried out via mastery tracking on Khan Academy. - We could introduce peer tutoring (pupils who learn faster help others). - Quarterly review to include sets of PISA-based problems.	Administrators, Teacher of mathematics, students.	Printing drills/ materials, school MOOE and PTA ₱1000	School MOOE and PTA	Quarterly	Improved Periodic Exam performance and competency proficiency.		The undertaking of the activities should be compliant with DepEd MELCs.

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