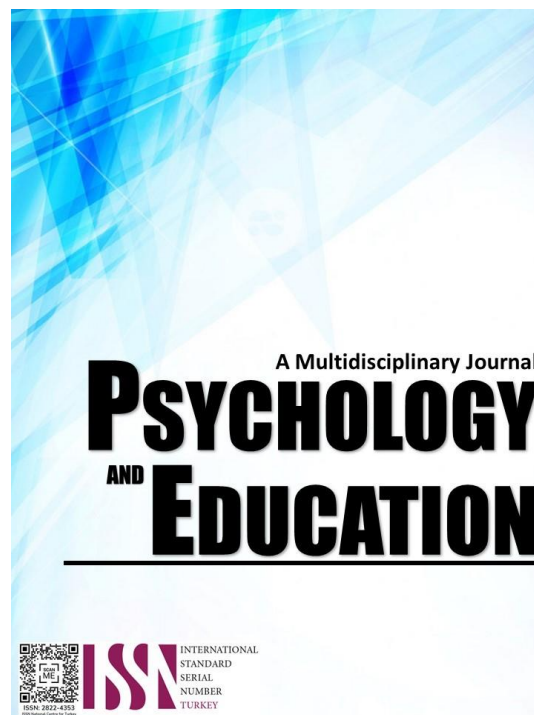


**FACTORS INFLUENCING THE MATHEMATICAL
COMPETENCE AND LITERACY SKILLS TO THE
MATHEMATICS PERFORMANCE OF GRADE 10 STUDENTS
IN SARIAYA EAST DISTRICT, SCHOOLS DIVISION OF
QUEZON: BASIS FOR LEARNING RECOVERY
MANAGEMENT AND TECHNICAL ASSISTANCE PLAN**



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Factors Influencing the Mathematical Competence and Literacy Skills to the Mathematics Performance of Grade 10 Students in Sariaya East District, Schools Division of Quezon: Basis for Learning Recovery Management and Technical Assistance Plan

Mark Hill S. Rosales*

[For affiliations and correspondence, see the last page.](#)

Abstract

Schools have been closed worldwide as a result of the pandemic. The education sector has shifted dramatically. The learning delivery system is a factor that needs to be addressed. Thus, this study aimed to identify the factors influencing mathematical competence and literacy skills, level of mathematical competence, and perceived level of mathematical literacy skills of grade 10 students in Sariaya East District, Schools Division of Quezon during the COVID-19 pandemic basis for developing learning recovery management and technical assistance plan. Based on the statistical findings, there is a significant relationship between the factors influencing mathematical competence and literacy skills to the Mathematics Performance of Grade 10 students. While the highest relationship between Grade 10 students' mathematics performance and their mathematical competence and literacy skills was practice. Furthermore, since the r-value shows significance from the 0.01 level of significance and most of the factors are associated with mathematical competence and literacy to the mathematics performance of Grade 10 students, thus, the null hypothesis is rejected.

Keywords: *mathematical competence, learning recovery management, technical assistance plan*

Introduction

Schools have been closed worldwide as a result of the pandemic. The education sector has shifted dramatically. The learning delivery system is a factor that needs to be addressed. DepEd Order No. 12, 2020, also known as the Adoption of Basic Education Learning Continuity Plan, seeks to minimize face-to-face instruction in favor of blended learning via modules, television, and radio. It sought to minimize face-to-face instruction in favor of blended learning via modules, television, radio, and online to halt the spread of the virus and protect school children, who are particularly vulnerable during this period (Dela Cruz, 2020).

Mathematics is one of the curriculum subjects recognized as the mother of all learning in the arts and sciences. Schools are urged to stick to the content of the Most Essential Learning Capabilities (MELCS) rather than generating a separate list of learning competencies for distinct learning areas. Parents should also support and motivate their children as things worsen. It also offers alternate evaluation techniques and may be used to monitor student progress in real-time (Tasan, 2021). Furthermore, the Department of Education stated that students' academic performance is affected by several factors: motivations, self-concept, parental support, teachers'

teaching strategies, and assessment tools.

On the other hand, a positive academic self-concept promotes good academic perspectives and behaviors, such as task perseverance, positive academic choices, educational goals, and academic accomplishment. The world would be in chaos if math did not exist (Karlen, 2021).

In terms of Mathematical Competence, Mamolo et al. (2020) cited that K to-12 Curriculum in the Philippines strives to prepare students for higher education and jobs. According to the Department of Education, the objective is to develop holistically equipped students with learned competencies. Kaleva et al. (2019) stated that Mathematical competence is a required learning result of education. Individuals must be able to think mathematically, grasp mathematical arguments, communicate in mathematical language, and employ suitable tools.

Mathematics literacy is a fundamental principle of mathematics that can motivate people to think about and understand mathematics in their daily lives. This will assist us in thinking numerically and spatially to interpret and analyze everyday situations (Imswatama & Lukman, 2018). It could be noted that the importance of mathematic literacy was also highlighted by the Indonesian Government Education and Culture Ministry. This encompasses mathematical



reasoning, concepts, procedures, facts, and mathematical instruments used to describe, explain, and predict phenomena.

Department of Education Secretary Leonor Briones articulated that the performance of Filipino students on the National Achievement Test (NAT) "gravitates towards the low proficiency levels," particularly in Science, Math, and English. Furthermore, Filipino pupils performed badly in mathematics and science, scoring 353 points compared to the OECD average of 489 points in both areas. The Program for International Student Evaluation (PISA) is a 15-year-old student assessment administered in 79 nations. Filipino students finished bottom out of 79 nations, and virtually last in science and math (Manila Bulletin, 2019).

Sariaya East District, SDO- Quezon, received an average MPS of 56.7% in mathematics during the school year of 2019-2020 (Numeracy Assessment 2020, Division of Quezon). Moreover, they got an MPS result of 71.4% in 2020-2021. These results showed that the Department of Education's achievement rate of 75% was not met. The low performance of learners in local, national, and international surveys on Mathematics competencies is evident.

Similarly, previous studies and assessments have paid little attention to the relationship between the factors influencing the level of mathematical competence and literacy in Grade 10 students. The researcher being a Mathematics teacher for almost 10 years, upon teaching he observed that the level of mathematical competence and literacy of the learners are below average level. In Learning Action Cell (LAC Session), the teacher participated in addressing the problem and discussed possible solutions and interventions.

Thus, this study aimed to identify the factors influencing mathematical competence and literacy skills, level of mathematical competence, and perceived level of mathematical literacy skills of grade 10 students in Sariaya East District, Schools Division of Quezon during the COVID-19 pandemic basis for developing learning recovery management and technical assistance plan.

Literature Review

Factors Influencing Mathematical Competence and Literacy Skills

Motivation is the driving force behind human conduct. One of the types of motivation for education that can help students stay motivated in school is the generalized tendency to strive for success and choose goal-oriented success/failure activities. Achievement motivation is another motivator that influences students' cognitive, emotional, and behavioral commitment to the educational process. Motivation is the initiation of a learning process, the direction set, and the perseverance in the path chosen. The relationship between academic motivation and mastering mathematics competencies has been well-studied in elementary (Mercader et al., 2017) and high school. Students need to stimulate to develop a desire to explore mathematical ideas by posing mathematically interesting problems after one has "finished" a problem.

Mathematics students who think they are helpful and do well tend to have a positive self-image. When Math is complex and exam results and performances are poor, people may think they cannot do well in the subject. Teaching strategies that eliminate students' gaps in performance could help improve students' performance in school. Mathematics students' self-concept evaluates their perceptions based on their experience and interpretation of the events they experience in school. This leads to the formation of specific attitudes, feelings, and perceptions about one's intellectual and academic abilities based on the educational scenario. Filipino students' Math performance needs to be improved, as evidenced by the 2016-2017 Global Competitiveness Report.

Cardino and Cruz (2020) mentioned that mathematics teachers mostly applied cooperative learning in teaching strategies. Teachers should apply appropriate teaching strategies that best suit specific objectives and competencies to secure and facilitate the process of knowledge transmission. Tulbure (2012) concluded that effective teaching requires flexibility, creativity, and responsibility to provide an instructional environment that responds to the learner's individual needs.

Formative assessment is essential for all types of learning. For the students to master learning competencies, teachers must update their approaches and teaching strategies that fit the learners' needs in these trying times. Ocampo (2021) stated the importance of mathematics teachers relating their thought to their diagnostic relevance in the classroom. Therefore, mathematics teachers have to consider an appropriate balance and coverage of the curriculum. Distance learning programs should integrate a



formative assessment component, whereby students submit work to teachers and provide individualized or collective feedback regarding learning content and student error patterns. This can be established through complementary communication elements between teachers and students (e.g., teachers checking in on students via mobile) or integrating parents' role as facilitators.

Parents have an important part in their child's academic achievement in the new normal of teaching and learning. They should be vigilant about their children's adverse reactions, which add to their stress. Parents' support is critical to the children's learning development without teachers. Online and modular schooling with parental guidelines can improve child-parent relationships.

Most Essential Learning Competencies

The Bureau of Curriculum Development restructured essential competencies into the Most Essential Learning Competencies (MELCs). The factors leading to poor performance in Mathematics are the science of reasoning and computations. MELCs enable teachers to direct instruction toward the most critical competencies that all students must acquire, transforming them into lifelong learners. SDRs and ROs are encouraged to supplement MELCs with self-learning modules, kits, and learning activity sheets (Pineda, 2020). Because of these, it somehow affects the mastery of the learners in Mathematics (Dimayuga, 2017). In his study, Michael (2015) stated that the factors leading to poor performance in Mathematics are the science of reasoning and computations. Mathematician Albert Einstein said that mathematics is the language that helps us describe ideas and relationships drawn from the environment. He added that mathematics enables one to make the invisible visible, thereby solving problems that would be impossible otherwise. Ganal and Guiab (2014) investigated the obstacles and difficulties faced by Bachelor of Elementary Education sophomore students in mastering mathematical learning abilities.

Mathematical Competence

The European Recommendations for Learning define mathematical competence as developing and applying mathematical reasoning to solve various problems in various situations (Bellini et al., 2019). Mathematics is one of the most important competencies to learn in school. The European Recommendations for Learning define mathematical competence as developing and applying mathematical reasoning to solve various

problems in various situations. In the Philippines, the K to 12 Curriculum aims to prepare students for higher education and careers by cultivating lifelong learning skills such as problem-solving, communication, and collaboration. It is centered on developing real-world skills and competencies and is designed to assist students in successfully mastering abilities at each stage of the learning process (Curry & Docherty, 2017).

Mathematics competence in terms of mathematics concepts and problem-solving skills. Capate & Lapinid (2015) conducted a study to determine the performance and difficulties of Grade 8 students during the first K to 12 Mathematics examination. The results of the study served as a basis for enhancing instruction and aligning the Grade 8 Mathematics competencies to Instruction and Assessment. The recommendations included needs assessment, more practice for automation, and peer-assisted mathematics instruction. In connection, Albano (2012) stated that competence in Mathematics is complex and hard to define, requiring students not to master not only knowledge and skills but at least some measurable abilities.

Mathematical Literacy

Mathematical literacy focuses on students' ability to analyze, justify, and communicate ideas effectively and formulate, solve and interpret mathematical problems in various forms and situations. Mathematical literacy includes basic computational skills, quantitative reasoning, spatial ability, and others. The International Commission on Mathematical Instruction said that Mathematics is used to solve science, engineering, and economics problems. Mathematical literacy (ML) is central to applying mathematical knowledge in everyday life. To be understood by other mathematicians, students must master precise mathematical vocabulary and grammar.

Terminology and various mathematical representations of ideas. There is little evidence that predictors and outcomes of ML affect achievement in nonmathematical domains. Using mathematical tools. The OECD then made future partial changes to the definitions and basic competencies of mathematical literacy (Szabo et al. 2020), describing seven basic mathematical abilities used, namely: Communication. It emphasizes the ability of individuals to present problems and solutions to others. Mathematizing. The ability to transform problems in the real world into mathematical form through mathematical modeling. Representation. It highlights the ability to interpret



various mathematical representations, objects, and situations. Reasoning and argument. It underscores the ability to think logically in exploring and connecting the elements of problems and their solutions. Devising strategies for solving problems. It emphasizes choosing and using various strategies in solving problems mathematically. Using symbolic, formal, and technical language and operations. It stresses mathematical literacy skills in understanding, interpreting, manipulating, and utilizing symbolic expressions in various mathematical contexts in solving mathematical problems. Using mathematical tools. It underlines the ability to use mathematical tools to help with mathematical activities.

Methodology

Research Design

The study employed a quantitative method utilizing a descriptive correlation research design, in which the researcher is primarily interested in describing factors influencing the mathematical competence and literacy skills of the Mathematics Performance of Grade 10 students. Correlational research is a non-experimental quantitative design in which the researcher applies correlational statistics to measure and describe the degree of association among variables or sets of scores (Creswell, 2012). This study assessed the mathematical competency, mathematical literacy skills, and factors affecting Grade 10 students' mastery of mathematics in the first quarter. The study utilized a researcher-made survey questionnaire as the basic instrument to gather relevant data. The variables are analyzed to determine the relationship between the student's mathematical competence and the factors influencing Grade 10 students' mastery of competencies. The relationship of the variables serves as an input to the developed Learning Recovery Management and Technical Assistance Plan for the students to enhance their mathematical competence and skills and lessen the factors influencing students in mastering competencies.

Respondents of the Study

Two hundred eighty-five (285) Grade 10 students in Sariaya East District, Sariaya Quezon were the respondents of the study. Random sampling was used to get the total sample of the population. Random sampling ensures that results from the sample should approximate what would have been obtained if the entire population had been measured. The simplest random sample allows all the units in the population to

have an equal chance of being selected.

Research Instrument

The researcher used a survey questionnaire as the main instrument for gathering the data. The contents of the questionnaire were modified and revised after validation. The self-made survey had two parts to measure factors influencing Grade 10 students' mastery of competencies. It consists of 50 questions covering all Patterns and Algebra topics (MELCS). The researcher will utilize survey questionnaires, including a checklist, to identify the factors influencing Grade 10 students' mastery of competencies. The questionnaire consists of 50 questions covering all Patterns and Algebra topics (MELCS) and mathematical competence (knowledge, attitudes, and practices), and perceived level of mathematical literacy skills.

Data Gathering Procedure

The researcher personally sought permission to perform the research study from the PSDS of San Juan West District via a letter. The study was undertaken with selected teachers after it had been approved. The researcher made a letter to obtain permission from the school principal. This confirmed that they agreed to let their teachers participate in the study.

The researcher personally administered and distributed the survey questionnaires to the respondents. No identifying information was recorded on the survey instruments to ensure the anonymity of each respondent. Enough time will be allocated for the respondents to answer the questionnaire. Afterward, the device was collected and prepared for tabulation and analysis. The respondent's identification remained private. There were no risks identified for being a part of this study.



Results and Discussion

Table 1. *Factors Influencing Mathematical Competence and Literacy Skills of Grade 10 Students*

Indicators	SD	Mean	Verbal Interpretation
Motivations	0.57	4.46	SA
Self-Concept	0.70	4.39	SA
Teaching Strategies	0.73	4.36	SA
Assessment Tools	0.66	4.42	SA
Parental Support	0.72	4.35	SA
Grand Mean	0.85	4.39	SA

Table 1 summarizes factors influencing the Mathematical Competence and Literacy Skills of Grade 10 students. The overall mean is 4.39, which is “Strongly Agree.” It was concluded that several factors influence Grade 10 students' mastery of math competencies in the new normal, most notably parental support where the parents cannot teach in the various learning areas, particularly Mathematics, English, and Science. Consequently, since homeschooling is not used to it, learners are in a state of adjustment to cope with the changing curriculum. (National Online Program Implementation Review Using SLMs in Different Learning Modalities Implemented in Light of the Basic Education – Learning Continuity Plan).

Table 2. *Most Essential Learning Competencies per Content Topic*

Content	Most Essential Learning Competencies	MPS (%)	Descriptive Interpretation
Series and Sequences	1. Generates patterns	61	Average Near Mastery
	2. Illustrates an arithmetic sequence	59	Average Near Mastery
	3. Determines arithmetic means, the <i>n</i> th term of an arithmetic sequence and the sum of the terms of a given arithmetic sequence.	56	Average Near Mastery
	4. Illustrates a geometric sequence.	49	Average Near Mastery
	5. Differentiates a geometric sequence from an arithmetic sequence.	36	Average Near Mastery
	6. Determines geometric means, the <i>n</i> th term of a geometric sequence, and the sum of the terms of a given finite or infinite geometric sequence.	30	Low Mastery
	7. Solves problems involving sequences.	29	Low Mastery

Polynomial Equations	1. Performs division of polynomials using long division and synthetic division.	29	Low Mastery
	2. Proves the Remainder Theorem, Factor Theorem, and the Rational Root Theorem.	23	Low Mastery
	3. Factors polynomials.	29	Low Mastery
	4. Illustrates polynomial equations.	28	Low Mastery
	5. Solves problems involving polynomials and polynomial equations.	26	Low Mastery
Overall Mean Percentage Score		37.91	Average Near Mastery

Table 2 shows the least mastered skills among the Most Essential Learning Competencies (MELCS) in terms of content, such as series and sequences and polynomial equations in Grade 10 Mathematics. It could be gleaned that the overall mean percentage score is 37.91, interpreted as *Average Near Mastery*. This suggests that much difficulty may be experienced when the topics where these competencies are needed to exert effort to attain mastery. In terms of series and sequences, most students generate patterns with a percentage score of 61%, described as *Average Near Mastery*. Moreover, two (2) of the most essential learning competencies had *Low mastery*. Thirty percent of the students could not calculate geometric means, the *n*th term of a geometric sequence, or the sum of the terms of a finite or infinite geometric sequence. On the other hand, 29% could not solve problems involving sequence.

In terms of *polynomial equations*, all competencies were described as *low mastery*. It simply means that the students' most essential competencies were the least mastered. The results supported by the study of Gurat (2018) concluded that mathematical skills are built upon one another. Students must master a fundamental mathematical skill or concept upon which everything else they learn will be created.

Moreover, Pura (2015) identified least mastered skills fall under the content of series and sequence and polynomial functions. She found out in her study that all the mastery levels are at the beginning level.

Similarly, Herrera and Dio (2016), all skills are considered least learned. It revealed that pupils have low-performance levels in solving word problems in mathematics. Additionally, Mathematics teachers pay special attention to students' unmastered abilities to



achieve a competence level of 75%. It is necessary to create a customized reading intervention plan. Remedial tutoring that incorporates a variety of exercises improves students' skills in mathematics (Jubilo 2020).

Table 3. *Perceived Level of Mathematical Competence of Grade 10 Students in Patterns and Algebra*

Indicators	Standard Deviation	Mean	Verbal Interpretation
Knowledge	1.41	2.82	ModC
Attitudes	0.73	4.29	MosC
Practices	0.71	4.36	MosC
Grand Mean	0.95	3.82	MorC

Table 3 shows the summary of the perceived level of mathematical competence of Grade 10 Students in terms of patterns and algebra. As observed in the table, students were more competent in terms of knowledge, attitude, and practices, with a grand mean of 3.82 and a standard deviation of 0.95. The majority of the students were competent in terms of attitudes and practices. However, they are moderately competent only in terms of knowledge. It could be perceived that the teachers should focus on the knowledge of the level of mathematical competence of Grade 10 students.

In support, Kaiser et. al. (2020) revealed that teachers and students must have high competency in subject matter knowledge. Students who know their subject matter thoroughly can be more effective and efficient at organizing it, connecting the subject with previous knowledge, finding useful analogies and examples, presenting current thinking on the subject, and establishing appropriate emphasis.

A positive attitude towards math can lead to higher achievement, and high achievement can result in more favorable attitudes. Students' attitude toward math can affect their overall achievement. A student's attitude reflects value, self-confidence, enjoyment, motivation, and anxiety surrounding math (Devilla & Manalo 2020).

Furthermore, Alkiyumi & Alfalasi (2021) cited that effective teaching of mathematics is based on the practices by the teachers to facilitate discourse among students to build a shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments. Practices gained from the teachers will serve as the foundation for

students to be more effective in mathematics subjects.

Additionally, Tasan (2021) found out that teachers' level of mathematical competence is very satisfactory, and academic performance shows a 100% passing grade. Similarly, there is a significant relationship between the level of teachers' content knowledge and pedagogy, learning environment and diversity of learners, curriculum and planning, assessment and reporting, plus factor and academic performance of the pupils in the implementation of modular distance learning modality. Thus, teachers' competencies significantly affect the pupils' performance in the modular distance learning modality.

Table 4. *Perceived Level of Mathematical Literacy Skills of Grade 10 Students in Patterns and Algebra*

Indicators	SD	Mean	Verbal Interpretation
Communication	0.94	3.29	ML
Mathematizing	0.91	3.46	MorL
Representation	0.87	3.37	ML
Reasoning and Arguments	0.91	3.47	MorL
Devising Strategies for Solving Problems	0.92	3.45	MorL
Using Symbolic, Formal, and Technical Language and Operations	0.87	3.37	ML
Using Mathematical Tools	0.89	3.43	MorL
Grand Mean	0.90	3.40	MorL

As presented in Table 4, it revealed that most students were more literate in Patterns and Algebra in terms of communication, mathematizing, representation, reasoning and arguments, devising strategies for solving problems, using symbolic, formal, and technical language and operations, and using mathematical tools. It is supported by the grand mean of 3.40.

The level of mathematical literacy of Grade 10 students should focus on developing communication since it is an essential skill for them to express their thoughts. The representation must be prioritized since it gives visual feedback for the students to learn and catch up on ideas and using symbolic, formal, and technical language and operations must be reiterated to maximize the student's potential. And in viewing this sense, it can be stated that most of the students were *more literate* in terms of reasoning and argument, with the highest mean of 3.47.

On the other hand, the student needs improvement in

terms of communication since they rated as *moderately literate* with a 3.29 mean score. Nevertheless, the result could be attributed to the statement of Rachmawati (2014) that the students' mathematical communication skills are still relatively low. Also, my mathematical communication skills are still low.

Similarly, Muharom (2014) pointed out that the learning carried out only emphasizes the demands of the curriculum so that students are passive in the learning process. The involvement of students tends to be minimal, resulting in the skills of reasoning and mathematical communication of the students being poorly developed.

Lestari and Yudhanegara (2016) suggest that mathematical communication is the ability to convey an idea mathematically, both orally and in writing, and to understand and accept people's mathematical ideas carefully, analysis, critical, and evaluation to sharpen the understanding. Therefore, mathematical communication skills students need to focus on mathematics learning.

Table 5. Correlation Between the Identified Factors Influencing Mathematical Competence and Literacy to the Mathematics Performance of Grade 10 Students

	Factors Influencing the Mathematical Competence and Literacy Skills of Grade 10 Students					Mathematics Performance of Grade 10 Students
	Motivations	Self-Concept	Teaching Strategies	Assessment Tools	Parental Support	
Mathematical Competence						
Knowledge	.796**	.706**	.869**	.759**	.833**	.702**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Attitudes	.779**	.799**	.767**	.707**	.838**	.763**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Practices	.789**	.722**	.702**	.739**	.743**	.757**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Mathematical Literacy						
Communication	.633**	.653**	.755**	.623**	.759**	.765**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Mathematizing	.601**	.607**	.733**	.608**	.607**	.733**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Representation	.674**	.753**	.782**	.674**	.753**	.772**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Reasoning and Argument	.683**	.789**	.755**	.756**	.856**	.701**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Devising Strategies for Solving Problems	.641**	.833**	.778**	.601**	.707**	.763**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Using symbolic, formal, and technical language and operations	.634**	.633**	.782**	.674**	.753**	.739**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Using Mathematical Tools	.623**	.706**	.755**	.838**	.769**	.749**
p-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Table 5 shows the Correlation between the identified Factors Influencing Mathematical Competence and Literacy to the Mathematics Performance of Grade 10 Students. The table also suggests a significant positive relationship between mathematical competence and mathematical literacy and Factors Influencing Mathematical Competence and Literacy in Grade 10 Students.

In mathematical competence, Knowledge has more connection to teaching strategies. Based on the results, Knowledge as to teaching strategies with ($r=.869$) at a 0.01 level of significance with a p-value of (0.0001). This indicates that the teaching strategies give positive feedback to student knowledge since the Knowledge of the students is based on the teaching strategies implemented by the teachers or the modalities being implemented. If the teaching strategies are well implemented, the students may increase students mathematical Knowledge and improve mathematics outcomes (Crawford et. al., 2020).

While on Mathematical competence in terms of attitudes, parental support has more connection, based on the results. Attitudes have a significant relationship with parental support ($r=.838$) with a p-value of (0.0001). This indicates that student attitudes towards parental support positively impact students' mathematical competence. If the parents strongly support their child, their child may improve in school and become motivated, showing positive discipline in their learning. This indicates the positive impact of parental support on the students' Knowledge during modular distance learning since supportive parents keep check and balance on their children and provide a guiding mechanism for their academic matters. The child's academic performance is assisted through regular monitoring, consistent meetings with the child, and checking all the matters of school and class to improve academic performance (Masood,2020).

Moreover, mathematical competence in terms of Practices has a very high relationship ($r=.789$) to self-concept with a p-value of (0.0001). This means that parents urge their children to take ownership of their learning by providing them with opportunities for decision-making when it comes to rules in answering modules. While it can be tempting to guide students through an assignment and show them how it has done, prompt them to reach the final answer in their way. Additionally, when students struggle with low self-esteem, it may significantly influence many aspects of their lives, from their ability to interact socially with others to their performance in the face of academic problems. It can dampen their drive to study



in the near term and for the rest of their lives. On the other hand, having a healthy self-concept might have the complete opposite impact. Furthermore, Soufi et al. (2014) cited that children must have a good self-concept for several reasons, affecting nearly every aspect of their lives. A good self-concept improves academic performance and strengthens social skills and the ability to cultivate supportive and lasting relationships.

In Mathematical literacy, in terms of communications, the most correlated factor is parental support, with (.759) with a p-value of (0.0001) indicating high correlations. This means that students' communications are well manifested since communication helps us build relationships by allowing us to share our experiences and needs and helps us connect to others. In support, Rohid & Rusmawati (2019). stated that mathematical communication skills refer to the students' ability to arrange and link their mathematical thinking through communication; communicate their logical and clear mathematical thinking to their friends, teachers, and others; analyze and assess mathematical thinking and strategies used by others; and use mathematical language to express mathematical ideas correctly. Referring to the importance of MCS in mathematics problem-solving, this study was intended to analyze students' mathematical communication skills in solving a mathematics problem.

Mathematical literacy, in terms of mathematizing, Teaching strategies, shows the most connected factors with (.733) with a p-value of (0.0001) indicating high correlations. This indicates that students learn more using various teaching strategies that lead to a complete understanding of a mathematical context. However, it remains a matter of how far the students want to mathematize. In support, Abidin et al. (2021) cited that learning and teaching for mathematization activities for prospective mathematics teachers can be carried out, for instance, through observation of the teaching and learning process, particularly for solving words related to maximum and minimum problems.

While in terms of Representation, teaching strategy is the most connected factor, with (.733) with a p-value of (0.0001) indicating high correlations. The results indicate that teachers use representations to instruct and by students to solve problems and communicate their mathematical ideas to others. When planning instruction, practice, or reinforcement activities, teachers should consider how they and their students can use Representation in today's mathematics lesson.

In support, Sokolowski (2018) cited that representations help students comprehend abstract mathematical concepts and enhance their skills.

On the other hand, in terms of Reasoning and Argument, Self-concept is a much-correlated factor, with (.789) with a p-value of (0.0001) indicating high correlations. The results also indicate that reasoning and argument are critical in mathematics learning because students who genuinely make sense of mathematical ideas can apply them in problem-solving and unfamiliar situations and use them as a foundation for future learning. Concerning self-concept, (Fricke 2018), a certain kind of reasoning requires a self-concept. We can only rationally revise our beliefs by knowing that we have them, in part because we can only see that there is a problem with an inconsistent set of propositions if we are aware of believing them.

Furthermore, in terms of Devising Strategies for Solving Problems, the most bond factors are the self-concept with (.833) with a p-value of (0.0001) which indicates high correlations. The study results indicate that devising strategies for solving problems helps the students improve their willingness to try problems and improve their perseverance when solving problems. Also, to improve students' self-concepts concerning their abilities to solve problems. Make students aware of problem-solving strategies (Gurat, 2018).

Using symbolic, formal, and technical language and operations, the most connected factors are the teaching strategies, with (.782) with a p-value of (0.0001) indicating high correlations. The results also revealed that using symbolic, formal, and technical language and operations helps students to understand the relationship between the context of the problem and the Representation of the mathematical solution. Also, this is used for understanding to help interpret the solution in context and gauge the feasibility and possible limitations (OECD, 2020). Teaching strategies help students understand and utilize formal constructs based on definitions, rules, and formal systems, as well as algorithms.

In Mathematical Tools, the most significant bond factors are the teaching strategy, with (.838) with a p-value of (0.0001) indicating high correlations. This means that mathematical tools enable students to manipulate and think about the ideas to more deeply understand the concept. Relevant to the teaching strategy as a factor, it makes students more actively engaged in their learning. Also, it sparks their interest during the lesson and helps them stay focused and learn to the best of their abilities. In support, Bringula

(2022) stated that a learning tool could be as simple as an image or as complex as a computer-based environment designed to improve mathematical understanding. The essential characteristic of a learning tool is that it supports learners in some manner. For example, a tool can aid memory, help students review their problem-solving processes, or allow students to compare their performance with others, thereby supporting self-assessment.

Furthermore, the relationship between the Mathematics Performance of Grade 10 students and the Mathematical Competence and Literacy Skills revealed that the most associated mathematical competence is the attitudes with (.763) with a p-value of (0.0001) indicating high correlations. This also indicates that most students have positive attitudes toward their learning in mathematics under modular learning. The results supported by the study of Abudi (2021) stated that modular learning modality serves as a supportive learning delivery modality during the new everyday teaching. Thus, students had a positive attitude toward implementing Modular Distance Learning and perceived it as having a positive effect on their learning experience and motivation to learn.

On the other hand, the relationship between the Mathematics Performance of Grade 10 students and Literacy Skills revealed that the most associated skill is representation, with (.772) with a p-value of (0.0001) indicating high correlations. This signifies that most Grade 10 students rely on representation to get an idea or answer a problem. The results supported by the (Clark, 2020) study stated that during modular learning, students tend to rely on representation in their modules to solve problems and communicate their mathematical ideas to others. Moreover, students are more able to connect and make sense of mathematical ideas and offer opportunities for understanding the lesson.

Learning Recovery Management and Technical Assistance Plan

Based on the findings, the researcher devised a Learning Recovery Management and Technical Assistance Plan to guide the School Heads' management process. This plan focused on the unmastered learning competencies based on MELCs and Technical Assistance during the management process of School Heads. The Learning Recovery Management plan incorporates the support and enabling mechanisms that shall be established and operationalized to ensure efficiency and effectiveness in learning delivery to address learning gaps, improve

learning outcomes, and the total well-being of the learners. At the same time, technical assistance is deemed necessary to ensure effective program implementation and, eventually, achieve higher or better learning outcomes. It should impact performance and, most of all, the general welfare of the people in the organization and of the organization itself.

Furthermore, Technical Assistance Plan for School Heads identifies the managerial and instructional support competencies that the school head would like to improve on or master; on the other hand, the Learning Recovery Management Plan for Teachers identifies the target teaching competencies, both generic (applicable for teachers in all subject areas) and subject-specific competencies that need to be developed. Its target competencies are based on the least mastered competencies in various subjects from the school year's first quarter. Implementing the Learning Recovery Management and Technical Assistance Plan will benefit the teachers and students to improve their performance.

Conclusion

Below are the conclusions which have been based on the findings of the study: (1) Based on the findings study concluded that the most influencing factor in the mathematical competence and literacy skills of Grade 10 students was the motivations. (2) Seven (7) competencies were the respondents' least learned and mastered competencies with the overall Average Near Mastery. In terms of knowledge, the level of mathematical competence of Grade 10 students in Patterns and Algebra is described as moderately competent. While in terms of attitudes interpreted as most competent and regarding practice described as most competent. (3) In Mathematical Literacy, the researcher concluded that students need to develop communication skills to articulate a solution since communications show the work involved in reaching a solution and summarizing and presenting mathematical results. The perceived level of mathematical literacy of Grade 10 students in Patterns and Algebra revealed that in terms of communication, Grade 10 students were described as more literate. In terms of mathematizing, the level of mathematical literacy of Grade 10 is described as more literate. In terms of representation interpreted as moderately literate. In terms of reasoning and arguments described as more literate. In terms of devising strategies for solving problems, as more literate. Using symbolic, formal, and technical language and operations are

interpreted as moderately literate. Using mathematical tools as more literate.

Furthermore, (4) there is a significant relationship between the factors influencing mathematical competence and literacy skills to the Mathematics Performance of Grade 10 students. While the highest relationship between Grade 10 students' mathematics performance and their mathematical competence and literacy skills was practice. Furthermore, since the *r*-value shows significance from the 0.01 level of significance and most of the factors are associated with mathematical competence and literacy to the mathematics performance of Grade 10 students, the null hypothesis is rejected. (5) Based on the findings, the researcher devised a Learning Recovery Management and Technical Assistance Plan to guide the School Heads' management process. This plan focused on the unmastered learning competencies based on MELCs and Technical Assistance during the management process of School Heads.

In light of the findings and conclusions derived from this study, the researcher recommends the following:

(1) Several factors influence Grade 10 Students in Mathematical Competence and Literacy. Since that teaching strategies and Devising strategies for solving problems significantly affect the student's mastery, the teacher may develop innovative teaching strategies for the parents to create the collaboration of school-home learning. (2) Based on the results of the study on mathematical competence, the researcher recommends that the teacher may focus on the knowledge level and the unmastered competencies. (3) Mathematics Teachers may develop innovative teaching strategies for developing mathematical literacy aligned to seven indicators of mathematical literacy. (4) A similar study may be conducted further to assess the implementation of the proposed Learning Recovery Management and Technical Assistance Plan that will improve the students' mathematical competence and literacy skills. Likewise, future researchers may also investigate other variables that may affect students' learning in mathematics or other learning areas.

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Affiliations and Corresponding Information

Mark Hill S. Rosales
Canda National High School
Department of Education - Philippines