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Parental Roles, Learners' Attitudes, ad Mathematics Performance

Mann P. Dela Cruz[1*], Eldefonso B. Natividad Jr[1]

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ABSTRACT

Improving the learners' mathematics performance remains a challenge in the educational system because many factors can significantly affect it. Hence, this study was conducted to determine the effect of these two factors, namely, parental roles and learners' attitudes, on Mathematics performance. Employing the descriptive-correlational research design, 328 Grade 6 learners and their parents randomly selected from all the public elementary schools in the Schools Division of Laoag City served as respondents. Data were obtained using self-perception survey instruments and were analyzed using frequency counts, percentages, mean, Pearson's r, and multiple linear regression analysis. Results revealed that parents highly practiced their parental roles as a motivator, resource provider, monitor, mathematics content advisor, and mathematics learning counselor. Also, learners had highly favorable attitudes towards Mathematics along with confidence, enjoyment, and benefit/value but moderately favorable along with anxiety. Moreover, they performed very satisfactorily in the subject. This study also showed that family income is not a factor in the extent of practices of the parental roles, but the number of children does, especially as a motivator. Also, learners' attitudes towards Mathematics are significantly affected by the extent of practices of parental roles. In addition, learners' performance is significantly affected by their attitudes towards the subject. Finally, Mathematics performance can be predicted through attitudes towards the subject along with enjoyment, anxiety, and confidence, together with the extent of practice as a Mathematics learning counselor with an explained variance of 20.80 %. Findings confirm the existing literature about the impact of parental roles and learners' attitudes on the learning process. Hence, the educational system could create programs and activities that foster and nourish high parents' participation and positive learners' attitudes for a better Mathematics performance

INTRODUCTION

Learners of today are one of the most important assets of the nation. They represent the future of the country and hold the hopes for a better nation. With this, they should be given adequate support in their development to make them more productive in the future.

However, it has been noted that learners are struggling in their academic performance, most especially in Mathematics. The Programme for International Student Assessment (PISA) and other international, national, and local examination results indicate an alarming learning condition among elementary school children.

The PISA in 2018 by the Organization for Economic Cooperation and Development (OECD) showed that Filipino students fared worst among 79 countries placing second-lowest in mathematical literacy (Galvez, 2019). The average score for the Philippines was 353 versus 489 for the OECD average.

Baclig (2020) mentioned that the Trends in International Mathematics and Science Study (TIMSS) 2019 also disclosed that the Philippines scored significantly lower than any other country that participated in grade 4 math. Magsambol (2020) cited that only 19% of Filipino students were on the Low benchmark, which means that they had some basic mathematical knowledge, while 81% did not even reach this level.

Albano (2019) also mentioned that the performance of Grade 6 learners in the National Achievement Test (NAT) had been steadily declining in the last three years, placing them at the low mastery descriptive level of the Department of Education (DepEd). The 2018 NAT results showed that for the third straight year, the national average mean percentage score (MPS) in the Grade 6 NAT continued its downward trajectory at 37.44, the weakest performance in the history of the standardized examination of the DepEd.

This kind of performance calls for the immediate attention of all educational system stakeholders to work as one in putting a remedy before things worsen. Undeniably, many factors affect learners' academic performance in Mathematics. Various research indicates that parental role in learning Mathematics and learners' attitudes towards the subject contribute to improved academic performance.

In the context of Mathematics, Cai et al. (1999) identified five parental roles in middle school students' learning of mathematics. They considered parents as a motivator, monitor, resource provider, mathematics content adviser and mathematics learning counselor.

Parental role has been proven to be a significant factor that positively influences children's education. Mamta and Giraldo- Garcia (2018) claimed that parents who are extensively involved in their child's education contribute to higher academic achievement, positive behaviors, and emotional development. Meanwhile, Navarro (2015) explained that low parental involvement would negatively

[1] Department of Education-Division of Laoag City, Philippines
[*] Corresponding author's e-mail: mann.delacruz@deped.gov.ph

impact students' performance in and out of the classroom and ultimately lead to lower grades, problems with attendance, lower self-esteem, and increased rates of suspension, drugs, alcohol abuse, and violence.

The current status of parental involvement in school is depressing. According to Dwyer and Hecht (2019), not all parents are as involved with their child's education as the schools want them to be. They mentioned that teachers still complain about getting parents to attend conferences, check homework, or answer notes. They explained that this happens because of lack of time, inadequate skill to help, and the belief that it is the school's job to educate their child which they refuse to take on any of that responsibility. Also, they claimed that parents feel that their involvement is unwanted by the student and that they undervalue education and do not place importance on its attainment.

The low level of parental involvement is observed personally by the researcher. Parents have poor attendance in PTA meetings. And if they come, they escape in the middle of the meeting. There is also little follow-up on their children's attendance and performance at school. They do not respond immediately when their attention is called for in school and cannot provide all the needs of their children, which the researcher does for them sometimes.

Aside from parental involvement, learners' attitudes towards Mathematics affect academic performance. These attitudes could be described in four extracted constructs: anxiety, confidence, enjoyment, and benefits/value (Osman, 2017).

Kennedy (2019) believed that a positive attitude towards math could lead to higher achievement. Mazana et al. (2019) revealed in their study that Mathematics' enjoyment and attitude significantly predicted students' performance. In a similar study, Pateros et al. (2019) concluded that a significant positive relationship exists between students' attitude and academic achievement towards Mathematics in terms of self-confidence, value, enjoyment, and motivation. Meanwhile, Schleicher (2013) argued that negative attitudes are at the root of the numeracy crisis. Chinn (2012) posited that the negative attitudes towards maths are damaging, leading to disengagement, increased anxiety and a lack of confidence, and a reluctance to improve skills. Attitudes towards Mathematics influence the efforts that learners put into understanding and practicing mathematical concepts and skills.

On a personal note, the researcher observed that learners' attitudes towards Mathematics are not favorable. Pupils lack the enthusiasm to work on assigned tasks, do not participate actively in the discussion, submit incomplete requirements, and cannot complete solutions to word problems.

In view of the foregoing, the researcher felt the need to determine the extent of practice of parents on their roles, the learners' attitudes towards Mathematics, and the impact of these variables on Mathematics academic performance

LITERATURE REVIEW

Mathematics Teaching

The K to 12 Mathematics curriculum adopts the spiral progression and integrative approach. A spiral progression and integrated Mathematics curriculum avoid the major disjunction between stages of schooling, provides the basis for continuity and consistency in the students' basic education. It allows learners to learn mathematics topics and skills appropriate to their developmental/cognitive stages. It also includes the connection and retention of concepts and skills to the other disciplines.

Integrated and spiral Mathematics curriculum values retention and mastery of content and skills. It deepens and reinforces learning allowing new knowledge to develop that encourages students to apply their previous learning and appreciate connections among the different content strands.

Mathematics education aims to develop a mathematically empowered citizenry equipped with critical and analytical thinking skills that encompass problem-solving skills, communicating mathematically, reasoning, and making mathematical connections. The vision is to achieve the focused goal by teaching solid mathematical content, developing strong cognitive skills, and promoting desirable cognitive values to all Filipino students no matter their background or circumstance (MATHTED, 2011).

Mathematics is a general education subject in primary and higher education where learners are expected to understand and appreciate its principles as applied in problem-solving, critical thinking, communicating, reasoning, making connections, representations, and decisions in real life using appropriate technology (DepEd, 2011).

The K to 12 Mathematics Curriculum Framework highlights this vision. At the core of the framework are the twin goals of mathematics education, namely: critical thinking and problem-solving.

These two goals could be attained with a systematized curriculum content, a well-defined set of higher-level skills and processes, as well as desirable values and attitudes, and appropriate tools, recognizing the different contexts of Filipino learners.

The K to 12 Mathematics Curriculum consists of five components, namely: Content, Skills and Processes, Values and Attitude, Mathematical Tools, and Context.

The K to 12 Curriculum Guide in Mathematics lists five content areas: Numbers and Number Sense, Measurement, Geometry, Patterns and Algebra, and Probability and Statistics. As expected in a spiraling curriculum, concepts related to each content area are learned in each grade level in increasing complexity and sophistication.

The K to 12 mathematics curriculum stipulates that students gain and develop the following skills and processes: knowing and understanding; estimating, computing and solving; visualizing and modeling; representing and communicating; conjecturing, reasoning, proving and decision-making; and applying

and connecting.

Alongside these skills and processes is the attainment of values that are important for becoming a productive citizen in the 21st century. According to DepEd (2013), accuracy, creativity, objectivity, perseverance, and productivity should be important outcomes in any learning activity.

The K to 12 Curriculum for Mathematics emphasizes the accumulation of meaningful learning by utilizing appropriate mathematical tools. The mathematics curriculum framework prescribes various manipulative objects, measuring devices in the teaching-learning process. Likewise, ICT-based resources ranging from a simple calculator to high-end computers and other gadgets such as smartphones and tablet P.C.s are recommended.

The curriculum also considers the context in which every learner exists (DepEd, 2013). Context is defined as a locale, situation, or set of conditions of Filipino learners that may influence their study and use mathematics to develop critical thinking and problem-solving skills. Context also refers to beliefs, environment, language, and culture, including traditions and practices and learners' prior knowledge and experiences.

These components, when implemented properly, are expected to improve and enhance learners' Mathematics proficiency significantly. The knowledge in content and Mathematics skills can be adequately processed through contextualization with the support of appropriate and relevant mathematical tools.

Parental Roles in Mathematics Education

Parents play an important role in a child's development. Being the first teachers, they teach them basic survival skills, including the fundamental skills of reading, writing, and arithmetic. As learners start formal education, they work with the school to ensure that learning is continued at home. Although there is difficulty categorizing parental involvement as there are so many types and styles, each study has its definition. One of these studies spoke about parental involvement in terms of parental roles, specifically in Mathematics education. Cai et al. (1999) identified five parental roles in middle school students' learning of mathematics. These included parents as a motivator, monitor, resource provider, mathematics content adviser, and mathematics learning counselor.

Motivator

Parents guide their children when they are having trouble learning Mathematics. They encourage them to work hard on math problems even though the problems are difficult. They motivate them to learn math well and to do a good job in Mathematics assignments.

Kastner (2020) explained that the work of a motivator is significant in ensuring that the individual becomes committed and feels a sense of belongingness to achieve better results faster. According to Muola (2015), students who are motivated are likely to perform well in their examinations.

Resource Provider

Parents provide a nice learning environment at home for their children to do Mathematics. They teach their children to access relevant Mathematics exercises over the internet, train them to select useful and relevant math-related books, and play with them through games and puzzles.

As cited in Jay *et al.* (2018), the provision of learning resources and activities at home, for example, books, music, and discussion of everyday facts, is associated with improvement in children's mathematics achievement. In the words of Drews (2015), the ability to use these materials in diverse ways can promote greater opportunities for investigational and collaborative work. Such activities are more likely to encourage purposeful Mathematical discussion and the development of logic and reasoning. The curriculum framework in Mathematics highlights the significant role of the Mathematical tool, be it a manipulative, measuring device, smartphone, calculator, computer, or the internet, to develop and engage in Mathematical thinking (DepEd, 2016). As cited in Jay *et al.* (2018), the provision of learning resources and activities at home, for example, books, music, and discussion of everyday facts, is associated with improvement in children's mathematics achievement. The University of Chicago (2012) found also that playing with puzzles could yield better skills.

Monitor

Parents check the assignments of their children. They spend time talking to them about progress in their math subject. They let the children show the results of their assignments, keep a balance between Mathematics and other subjects, and monitor the amount of time spent on Mathematics at home. Centers for Disease Control and Prevention (2012) explained that when parents make a habit of knowing about their teens' activities, companions, and whereabouts, and set clear expectations for behavior with regular check-ins to be sure these expectations are being met, they can reduce their teens' risks.

Mathematics Content Advisor

Parents help their children solve Mathematics problems at home. They allot time to discuss the topics their children are studying and the Mathematics they use in everyday life. They help their children do their homework. Ntenake (2018) explained that learners whose parents are involved in learning the content of the subject are active and ready to learn. They learn to be punctual from a young age and persistent, as the parents would continuously inquire about their progress and not want to disappoint them. As also claimed by Jay *et al.* (2018), parents who are directly involved in the content of children's homework could positively affect their children's achievement.

Mathematics Learning Counselor

Parents apply strategies to help their children overcome weaknesses in Mathematics. They gather information

about the approaches used to teach Mathematics, explore these approaches to help the child learn Mathematics, and recognize their child's strengths and weaknesses in learning Mathematics. Finally, they match the expectations with the potentials of their child. As Ceka and Murati (2016) put it, when parents involve themselves in the education process of their children, usually the outcome can be qualified as a positive and encouraging one. Furner (2017) also argued that when children are on the right disposition toward Mathematics, they can make career choices better. Parents' involvement at school is important as it has led to higher performance for children (Strayhorn, 2010). According to Bartolome *et al.* (2017), involving parents in education has been reported to yield positive outcomes in many aspects, including increased student attendance to and satisfaction with school, better academic achievement, motivation, school attachment, responsibility and confidence, better social adaptation, and less discipline problems. However, this involvement can sometimes be difficult because of parents' demanding workloads, daily stress, little knowledge, or inability to help with Mathematics (Holloway *et al.*, 2013).

Researches also show that lack of Mathematics content knowledge can limit how parents are involved in their children's Mathematics learning (Muir, 2011). This causes concern for parents as their eagerness to help can be barred by their ability to help. It could be that their lack of Mathematics knowledge limits their involvement in monitoring their children's learning rather than teaching or getting engaged in the Mathematics that their child is learning. This may be attributed to their level of education in Mathematics and the difference between how children are presently taught Mathematics in comparison to how parents were taught Mathematics.

Williams and Sanchez (2011) also identified four areas that are barriers to involvement: time poverty, lack of access, lack of financial resources, and lack of awareness. According to Asian Development Bank (2018), in the Philippines, 16.6% of the population lived below the national poverty line in 2018, which implies that many children were not in school since their parents cannot provide their daily needs. Some Filipinos lived in a remote area, with no internet connections at all, which brought to failure to access details on their studies. Due to poverty, some children lack materials needed in their studies which will greatly affect their academic performance.

Dwyer and Hecht (2019) also enumerated the barriers to parent involvement such as lack of desire or confidence to become involved, inadequate skill to help, the feeling that their participation is unwanted by their children or is not necessary given that their children are doing well already in school, and home-school scheduling conflicts.

Parents must be considered a constant and principal component of the curriculum (Bartolome *et al.*, 2017).

Success at school is guaranteed if parents' involvement at home supports school-based instruction. According to Sapungan and Sapungan (as cited in Bartolome *et al.*, 2017), if parents are involved in educating their children, it is tantamount to saying that the school is proactive in implementing changes or development among the students. As parent's involvement is increased, teachers and school administrators also raise the chance to realize quality reform in education.

The participation of parents in their children's Mathematics learning positively can help teachers understand their children's development. Performing their different parental roles benefit their children's education. In the words of Lara and Saracostti (2019), parental involvement is a key factor for children's academic outcomes. Despite parental involvement barriers, preparing children spiritually, socially, emotionally, physically, and intellectually remains a shared responsibility. Thus, parents need to communicate with teachers to help their children at school and home.

Learners' Attitudes towards Mathematics

Learners' attitude towards the subject is an important educational outcome (Langat, 2015). It has a strong effect on behavior, which helps understand and predict people's behavior in a wide range of contexts. Attitudes, though not directly observable, are inferred from observable responses and behaviors. Osman (2017) enumerated four learners' attitudes towards Mathematics. These are considered extracted constructs that include anxiety, confidence, enjoyment, and benefits/value.

Anxiety

Here, learners feel nervous when working in Mathematics activities or when their teacher is in class. As if they get sick when they are thinking math. They feel frustrated, brought about by their insecurities, when asked questions about Mathematics. This response impacts their attitude and motivation to learn Mathematics, consequently on their achievement (Getahun *et al.*, 2016).

Sokolowsi and Ansari (2017) explained that children are more likely to develop Math anxiety when they struggle with learning numbers when they are very young or when they experience certain kinds of social situations that influence their thoughts or feelings, two of which are peer pressure and teachers' attitudes.

Hoorfar and Taleb (2015) established that Math anxiety is negatively correlated with metacognitive knowledge, which is the ability to reflect, understand, and control one's learning. This means that the more anxious the students are, the less metacognitive knowledge they possess in doing Mathematics.

Shakir (2014) claimed that there is an inverse relationship between academic achievement and academic anxiety. As claimed by Gichohi (2019), high anxiety levels are a cursor to dismal academic achievement. Also, Afolayan *et al.* (2015) explained that students performed better when they are not anxious than when they are anxious. Hence, learners need to maintain optimal state of health and mind for better academic achievement.

Confidence

This is contrary to the first one. Here, learners have

self-confidence in learning Mathematics. Learners feel confident in taking Mathematics tests; thus, they can solve Mathematics problems without difficulty. Moreover, they have confidence in asking and answering Mathematics questions. According to Perkins (2018), self-confidence is related to success, achievements in education, conciliation, and a person's well-being, among other things, and self-efficacy, self-esteem, and self-compassion are the three factors that can affect the level of self-confidence of any individual. Ciftci and Yildiz (2019) argued that self-confidence has a significant effect on mathematics achievement. Arshad *et al.* (2015) argued that high level of confidence leads to good academic performance. Also, Akbari and Sahibzada (2020) explained that self-confidence can lead students to improved participation, joyful learning, reduced test anxiety, increased interest in goal seeking, and growth of comfort with their lecturers and classmates. Parental involvement could provide a way to facilitate children's confidence in Mathematics, subsequently improving learning outcomes (Farr, 2015). Daabell (2018) explained that what parents do with their children at home affects their children's level of enjoyment. He added that when parents interact with their children to promote Maths, positive things, including self-enjoyment, will happen.

Enjoyment

Learners feel enjoyment in Mathematics when they have developed confidence. With this kind of attitude, they enjoy doing Mathematics. They are mesmerized with Mathematics problems and feel comfortable working with Mathematics. They are looking forward to the time of their math subject and enjoy working with friends. Kupari and Nissinen's (2013) explained that learners learn Mathematics because they find it enjoyable and interesting. They further claimed that this enjoyment affects both the degree and continuity of engagement in learning and the depth of understanding. The more students enjoy doing mathematics, the more they are likely to engage in problem-solving, thus enhancing their learning and performance. Students' enjoyment while learning can influence their behavior or cognitive aspect of attitude (Syyeda, 2016).

Benefits/Value

Here, learners recognize the importance of Mathematics in their daily lives. They embrace the necessity of Mathematics because they think that it has a big help in the future to earn them a living. They show eagerness to gain more mathematics skills since it helps them make good decisions and improve their thinking capacity.

Syyeda (2016) explained that if students recognize the importance of mathematics in their lives, they will become motivated to study, practice, and learn the subject. With this, learners could be viewed as highly motivated for seeing the significance of Mathematics to construct meanings of their way of life beyond the numbers and formulas. As Adelson and McCoach (2011) mentioned, knowledge about the benefits/value of Mathematics influences students' attitude towards the subject.

Capuno *et al.* (2019) pointed out that students' attitudes towards mathematics would affect how well they perform in the subject and how often they engage in the subject. They claimed that if the respondents perceived a higher value for math, the better they perform in the subject. Also, it leads support to the idea of Kountouri *et al.* (2013) that the value that students give to mathematics can work as a protective factor against mark decline and all the related consequences for their future career.

Learners' attitude towards Mathematics influences the efforts they put into understanding and practicing Mathematical concepts and skills. Akey (2016) mentioned that students' beliefs about their competence and their expectations for success in school had been directly linked to their levels of engagement and emotional states that promote or interfere with their ability to be academically successful. Hence, a positive attitude should be nurtured regardless of the achievement level of the learners who should be helped to bring out their best abilities (Langat, 2015). As posited by Chenn *et al.* (2018), a positive attitude impacts academic achievement and learning in children. It is associated with increased engagement.

On the contrary, negative attitudes are at the root of the numeracy crisis (Schleicher, 2013). Chinn (2012) claimed that negative attitudes towards Mathematics are damaging, leading to disengagement, increased anxiety, a lack of confidence, and a reluctance to improve skills.

While the causes of a negative attitude around Mathematics are numerous and complex, it is clear that bad experiences in Mathematics, math anxiety, and lack of support from adults lead to negative attitudes (Chinn, 2012).

Kennedy (2019) believed that getting involved as early as possible is the best way to prevent long-lasting negative attitudes towards Mathematics. Attitudes have to change to improve and benefit from raised numeracy levels. Therefore, it is necessary for Mathematics teachers to strive and sustain positive attitudes towards Mathematics for good performance in the upper classes (Jumadi *et al.*, 2013).

Learners' Level of Performance in Mathematics

Mathematics has been considered the queen of all sciences because the language of numbers emphasizes scientific, technological, and social breakthroughs. Thus, this subject should not be taken for granted because it has a significant role in the advancement of society. While Mathematics is an essential subject almost in every field, problems related to Mathematics achievement are still evident in the Philippine setting and other countries. The results of international assessments reveal this said reality. The 2019 Trends in Mathematics and Science Study for Grade 4 confirmed the country's very dismal condition of Mathematics education. Baclig (2020) cited that the study follows the four International Benchmarks to interpret the student's performance. These include the Advanced

International Benchmark (625), High International Benchmark (550), Intermediate International Benchmark (475), and Low International Benchmark (400).

Based on the results cited in an article by CNN Philippines (2020), the Philippines scored 297 in Mathematics the lowest among the 58 countries involved in the study. The study showed that only one percent of Filipino students reached the high benchmark in Mathematics, which means that very few students could apply conceptual understanding to solve problems (Doctor, 2020). About six percent of Filipino students reached the intermediate benchmark to apply basic mathematical knowledge in simple situations, while Around 19 percent of them finished in the low benchmark; 74% percent did not even manage to achieve this level. Learners in the low benchmark possess some basic mathematical knowledge. They can add, subtract, multiply, divide one- and two-digit whole numbers, solve simple word problems, know simple fractions and common geometric shapes, and read and complete simple bar graphs and tables.

Another international result mirrored the dismal performance of the Filipino learners. In an article by Dela Cruz (2019), he cited that the results of the Programme for International Student Assessment (PISA) by the Organization for Economic Cooperation and Development (OECD) showed that Filipino students fared worst among 79 countries, being the second-lowest in mathematical literacy. The Philippines scored 353 points in Mathematical Literacy, below the average of 489 points. According to the Education Research Centre (2020), PISA is an international assessment of the skills and knowledge of 15-year-olds. It assesses students' performance on real-life tasks considered relevant for effective participation in adult society and life-long learning.

The results of the international assessment are consistent even with the National Achievement Test (NAT) results. Estanislao (2019) mentioned in The Manila Times article that most schools and institutions did not make it to the passing rate set by the National Educational Testing and Research Center (NETRC) for the 2018 NAT. The NAT results showed that for the third straight year, the national average mean percentage (MPS) in the Grade 6 NAT continued its downward trajectory at 37.44, the weakest performance in the history of the standardized test examination of DepEd.

There are four (4) factors affecting the low performance of learners. Firstly is the content-related factors, which cover the mathematical content taught to learners and teachers' pedagogical content knowledge. Secondly is the didactical factors, which refer to all aspects within the school context, including those resulting from incorrect teaching and learning methods or strategies. Third is the systemic factors, which relate to all factors associated with the policy on assessments, the number of periods to be taught, and other relevant aspects. Fourth is the social-based factors, which take the idea that learners are social beings. Meanwhile, low performance in Mathematics may be attributed to the negative attitude towards Mathematics and the worldview that it is a difficult subject (Khatoon, 2010).

The negative attitude may have its roots in teaching and teachers, with maths anxious teachers resulting in maths anxious learners at times. According to Taylor and Reddi (2013), lack of resources like models, pictures, drawings, graphics, calculators, and charts could also contribute to learners' negative attitudes towards mathematics. Meanwhile, there are factors that help increase learners' performance. Firstly, there is a need to improve teachers' pedagogical content knowledge by providing in-service training in the use of learner-centered teaching methods that are appropriate and that make the learning of Mathematics meaningful. Secondly, principals need to provide leadership on the curriculum and administration and management to ensure proper adherence to prescribed contact time between educator and learner attendance. Thirdly, learners should always be punctual and attend all the periods. Lastly, the parental role is a must for the parents.

The results of the assessment programs could establish a baseline to global standards and benchmark the effectiveness of succeeding reforms on education. DepEd is now focusing on four key areas – the K to 12 program review and updating, learning facilities improvement, teachers and school heads' upskilling and reskilling, and stakeholders' (e.g., parents and guardians of students) engagement for support and collaboration (Dela Cruz, 2019).

Indeed, improving the performance of learners is a challenge to the state. The international and national assessment results show the urgency of addressing issues and gaps in attaining quality basic education in the Philippines. According to Dela Cruz (2019), the factors that may have impacted the low performance could be addressed by implementing aggressive reforms to improve the country's quality of basic education.

MATERIALS AND METHODS

Research Design

This study used the descriptive-correlational research design. According to Calmorin (2016), this design focuses on the existing situation and phenomenon to present facts of essential knowledge about the situation or phenomenon and to determine the relationship between three variables, that is, to analyze the changes in one characteristic or phenomena which correspond to the changes in another or with one another. This study was descriptive since it describes the socio-demographic characteristics of the parent-respondents, their extent of practice in their parental roles, and the learners' attitudes towards Mathematics, including their level of Mathematics performance for the last two school years. On the other hand, it was correlational because it establishes a possible relationship between and among the independent, mediating, and dependent variables. Further, it determined the factors that could "best" predict academic performance in Mathematics.

Population and Sample

Parents and learners of Grade 6 of the 34 public elementary schools in the Schools Division of Laoag City served as the population in this study. A total of 328 parent-respondents and 328 learner-respondents served as samples of the study computed using Slovin's Formula and determined using stratified random sampling.

Instruments

Two instruments were used to gather data for this study: the parents' survey questionnaire on parental roles and the learners' survey questionnaire on their attitude towards mathematics and their level of performance.

Parents' Survey Questionnaire on Parental Roles

This instrument contained two parts. Part 1 elicited responses on the parent-respondents' socio-demographic characteristics, along with their monthly income and number of children in the family. Part 2 is a rating scale that obtained information about the extent of practice of parents in fulfilling their roles as a motivator, resource provider, monitor, Mathematics content advisor, and Mathematics learning counselor. The indicators were adopted from Cai *et al.* (1999) with Cronbach alpha coefficients of 0.82 for the Chinese samples and 0.89 for the US sample. However, the scale was modified to suit the purpose of the study. The parent-respondents were asked to rate their extent of practice using a 5-point Likert type scale, with 1 the lowest, as Not Practiced, and 5, the highest, as Very Highly Practiced.

Learners' Survey Questionnaire on their Attitude Towards Mathematics and Level of Performance.

This instrument had three parts. Part I asked the learners to give their personal information, namely: their name and school being attended. Part II was the rating scale that determined the learners' attitude towards Mathematics along with the four extracted constructs, namely: anxiety, confidence, enjoyment, and benefits/value. The indicators are adopted from Osman (2017) with Cronbach's Alpha Coefficient of the four constructs ranging between 0.75 to 0.92. However, the scale was modified to fit into the purpose of the study. Learners rated their attitudes towards Mathematics using a 5-point Likert type scale, with 1, the lowest, as Strongly Disagree and 5, the highest as Strongly Agree. Part III was an open-ended question that allowed learners to write down their final numerical rating in Mathematics for the past two years, specifically SY 2018-2019 and SY 2019-2020.

Data Gathering Procedure

For the data collection procedures, the researcher wrote a formal letter of request addressed to the Schools Division Superintendent (SDS) of Laoag City, signifying the intention to conduct the study. Upon the approval of the SDS, the copies of the research instrument were handed personally to some of the respondents. Others with internet connection accessed the survey tool using a google docs link. Data were gathered from November 10, 2020 to January 25, 2021. The results of the parents and learners' survey questionnaires were analyzed to answer the research questions.

Data Analysis

Frequency counts, percentages, mean, Pearson's r, and multiple linear regression analysis were used to analyze and interpret the data gathered. Socio-demographic characteristics of parents were interpreted using frequency counts and percentage. The extent of practice on parental roles was interpreted using the weighted mean with assigned qualitative interpretation shown below.

Range of Means	Descriptive Interpretation
4.51 - 5.00	Very Highly Practiced (VHP)
3.51 - 4.50	Highly Practiced (HP)
2.51 - 3.50	Moderately Practiced (MP)
1.51 - 2.50	Slightly Practiced (SP)
1.00 - 1.50	Not Practiced (NP)

The pupils' attitude towards Mathematics was interpreted using the weighted mean with assigned qualitative interpretation defined below:

Range of Means	Descriptive Interpretation
4.51 - 5.00	Strongly Agree (SA)/ Very Highly Favorable (VHF)
3.51 - 4.50	Agree (A)/ Highly Favorable (HF)
2.51 - 3.50	Undecided (U)/ Moderately Favorable (MF)
1.51 - 2.50	Disagree (D)/ Slightly Favorable (SF)
1.00 - 1.50	Strongly Disagree (SD) / Unfavorable(UF

The academic performance of the learners was analyzed using the grading scale with corresponding qualitative interpretation defined below:

Grading Scale	Descriptive Interpretation
90 – 100	Outstanding
85 – 89	Very Satisfactory
80 – 84	Satisfactory
75 – 79	Fairly Satisfactory
Below 75	Did Not Meet Expectations

Pearson's r was used to test the null hypotheses on the relationships of the variables, while multiple linear regression analysis was used to determine the possible predictors of academic performance. The level of significance was set at .05.

RESULTS AND DISCUSSION

Results

Socio-demographic characteristics of the parents; parents' extent of practice of their parental roles; attitudes of the learners towards mathematics; performance of learners

in mathematics; the relationship between the socio-demographic characteristics of the parents and their extent of practice of their parental roles; the relationship between the parents' extent of practice of parental roles and learners' attitudes towards mathematics and their performance in mathematics; the relationship between learners' attitudes towards mathematics and their performance; and the predictors of learners' performance in mathematics.

Socio-demographic Characteristics of the Parents

The profile of the parents according to monthly income and the number of children. The distribution of parents according to each of the two socio-demographic characteristics is shown in Table 1. Monthly Income Based on the table, the greatest number of parent-respondents has a monthly income of Php 10,001 – 15,000 (100 or 30.43%). This is followed by parents with a monthly income of Php 5,000 and below (80 or 24.39%). Sixty (18.29%) of them have a monthly income of Php 5,001 – Php 10,000, while 45 or 13.72% belong to families with a monthly income of Php 15,001 – Php 20,000. Furthermore, it can be gleaned from the table that only six (1.83%) reported that they have a monthly income of Php 50,001 and above, while the rest have a monthly income that ranges from Php 20,001 to Php 50,000 (37 or 11.28%). As regards the observed distribution of the

Table 1: Distribution of parents according to monthly income and number of children in the family

Socio-demographic Characteristics	f	%
Monthly Income		
Php 50,000.00 & above	6	1.83
45,001 – 50,000	5	1.52
40,001 – 45,000	0	0.00
35,001 – 40,000	5	1.52
30,001 – 35,000	3	0.91
25,001 – 25,000	13	3.96
20,001 – 25,000	11	3.35
15,001 – 20,000	45	13.72
10,001 – 15,000	100	30.43
5,001 - 10,000	60	18.29
5,000 & below	80	24.39
Total	**328**	**100.00**
Number of Children in the Family 9-10	1	0.30
7 – 8	3	0.91
5 – 6	15	4.57
3 – 4	130	39.63
1 – 2	179	54.57
Total	**328**	**100.00**

parents according to their monthly income, the majority of them belong to the low-income group, that is, from poor (below Php 10,957 monthly income) to low-income but not poor (Php 10,957 to Php 21,914 monthly income) based on the report of the Philippine Institute for Development Studies (PIDS) on the country's income class brackets that the government uses to categorize families into income classes (Domingo, 2020).

This economic status could mean a considerable impact on the performance of their children. Lacour and Tissington (2013) found in their study that poverty directly affects academic achievement due to the lack of resources, emphasizing financial resources available for students' success. Number of Children in the Family.

With regard to the number of children, it can be noted that the majority of the parents disclosed that they have one child or two children (179 or 54.57), and more than one-third of the parent-respondents reported that they have 3 - 4 children (130 or 39.63%). The rest have 5-6 (15 or 4.57%), 7-8 (3 or .91%) or 9-10 (1 or .30%) children. The results indicate that parents consider the number of children they could rear. Nonetheless, be it few or many, parents' primary concern is how they could provide for their children's needs, so they could grow and develop physically, mentally, socially, and emotionally well. Collins (2016) cited that economics influences family size more than other considered factors. Hence, these parents thought of their financial capacity to ensure their kids can grow up to be well-adjusted, successful adults.

Parents' Extent of Practice in Their Parental Roles

The parents' extent of practice of their parental roles as motivator, resource provider, monitor, mathematics content advisor, and mathematics learning counselor. The mean ratings of the parents' extent of practice of the different indicators, together with the composite mean rating for each of the five dimensions of parental roles, are shown in Tables 2a, 2b, 2c, 2d, and 2e.

Motivator

Table 2a shows the mean extent to which the parents practice their parental role as a motivator. They claimed that they Highly Practiced their parental role as a motivator, as indicated by the composite mean of 3.99, which falls within the range of 3.51- 4.50. This suggests that parents provide enough motivation to their children to gain interest in studying Mathematics despite its innate abstract nature. They sufficiently equip them with enthusiasm to keep learning Mathematical despite the difficulties that may be encountered in understanding the concepts and solving word problems. Specifically, as revealed by the mean ratings, which range from 3.63 to 4.19, the parents claimed that they Highly Practiced

Table 2a: Parents' extent of practice in their role as motivator.

Indicators	Mean	DI
1. When my child says he/she is having trouble learning mathematics, I tell him/her not to worry about it because everybody has problems with mathematics.	3.63	HP
2. At home, I encourage my child to work hard on math problems even though the problems are difficult.	3.98	HP
3. I motivate my child to learn math.	4.19	HP
4. I motivate my child to do a good job on his/her mathematics assignments.	4.15	HP
Composite Mean	**3.99**	**HP**

Legend

Range of Means	Descriptive Interpretation
4.51 - 5.00	Very Highly Practiced (VHP)
3.51 - 4.50	Highly Practiced (HP)
2.51 - 3.50	Moderately Practiced (MP)
1.51 - 2.50	Slightly Practiced (SP)
1.00 - 1.50	Not Practiced (NP)

role as a motivator by telling that their children not to worry about their trouble in learning mathematics because everybody has problems with mathematics and by encouraging them to work hard on math problems even though the problems are difficult. Moreover, the parents claimed that they motivate their children to learn math and do a good job on their Mathematics assignments. The findings suggest that parents provide emotional support to their children to learn the basics of Mathematics and do more advanced Mathematical learning tasks. Their warmth as parents stimulates their children's desire to achieve what they want and to keep going to full potential and performance.

Kastner (2020) explained that the work of a motivator is significant in ensuring that the individual becomes committed and feels a sense of belongingness to achieve better results faster. Hence, the parents in this study serve as great motivators to their children by creating a motivating work atmosphere to become critical thinkers and problem-solvers, which are the main goals of Mathematics education. According to Muola (2015), students who are motivated are likely to perform well in their examinations.

Resource Provider

Regarding the extent to which the parents practice their parental role as a resource provider, it can be inferred from the composite mean of 3.68 reflected in Table 2b that generally, the parents Highly Practiced such a role in their children's learning of mathematics. This means that parents are giving their full extent of support to the material needs of their children in learning the fundamentals and understanding the complexities of Mathematics.

Out of the five specific roles as resource provider, it can be noted that the parents Highly Practiced the specific

Table 2b: Parents' extent of practice in their role as resource provider.

Indicators	Mean Rating	DI
1. I create a nice learning environment at home for my child to do math.	3.91	HP
2. I teach my child to access relevant exercises in mathematics over the internet.	3.63	HP
3. I train my child in selecting useful and relevant math-related books for my child.	3.68	HP
4. At our house, I play games and puzzles that encourage the development of my child's math skills with him/her.	3.45	MP
5. At home, I demonstrate the use of math tools, calculators, and rulers.	3.71	HP
Composite Mean Rating	**3.68**	**HP**

Legend

Range of Means	Descriptive Interpretation
4.51 - 5.00	Very Highly Practiced (VHP)
3.51 - 4.50	Highly Practiced (HP)
2.51 - 3.50	Moderately Practiced (MP)
1.51 - 2.50	Slightly Practiced (SP)
1.00 - 1.50	Not Practiced (NP)

roles of creating a nice learning environment at home for their children to do math, teaching their children to access relevant exercises in mathematics over the internet, training their children in selecting useful and relevant math-related books for their children, and demonstrating the use of math tools, calculators and rulers, as clearly shown by the computed mean of 3.91, 3.63, 3.68 and 3.71, respectively. The results could mean that parents are serious about their role as resource providers. They understand what their children need to master the skills and competencies in Mathematics as required in the curriculum. Hence, they provide a conducive environment with readily available resources to practice Mathematical skills and processes. The curriculum framework in Mathematics highlights the significant role of the Mathematical tool, be it a manipulative, measuring device, smartphone, calculator, computer, or the internet, to develop and engage in Mathematical thinking (DepEd, 2016). In the words of Drews (2015), the ability to use these materials in diverse ways can promote greater opportunities for investigational and collaborative work. Such activities are more likely to encourage purposeful Mathematical discussion and the development of logic and reasoning. It is then the parents' desire for their children to contextualize Mathematical ideas; hence, providing them the needed resources could make the abstract concepts into more meaningful concrete experiences through these resources. As cited in Jay *et al.* (2018), the provision of learning resources and activities at home, for example, books, music, and discussion of everyday facts, is associated with improvement in children's mathematics achievement. However, it can be noted that they only Moderately Practiced the specific role of playing games and puzzles that encourage the development of their children's math skills with them. This is understandable for two reasons. First, parents are preoccupied with other household and office chores. Playing games and puzzles with their children could just be less important than fulfilling their other roles. Second, parents could not afford to buy these kinds of resources. As discussed in Table 2, their financial condition is challenging; thus, buying games and puzzles is less of their priority. Though this finding could not support the idea of the University of Chicago (2012) that playing with puzzles could yield better skills, this role of parents could have been compensated by resorting to some other learning resources which they believe could be more practical and favorable to their work and financial conditions.

Monitor

Monitoring is one of the parental roles that parents practice in relation to their children's study of Mathematics. Table 2c shows the mean ratings and composite mean rating of the parents that indicate their extent of practice of the specific roles and as monitor in general.

It can be noted that the composite mean of 4.06 indicates that generally, the parents Highly Practiced their role as a monitor. This suggests that they are in close supervision on the studies of their children. This is to ensure that their children's strengths in learning Mathematics are reinforced and their weaknesses are remediated.

Table 2c: Parents' extent of practice in their role as monitor

Indicators	Mean Rating	DI
1. I check my child's homework.	4.25	HP
2. I spend time talking with my child about his/her progress in math.	4.02	HP
3. I require my child to show me the results on all math assignments.	4.09	HP
4. At home, I allow my child to keep a balance between mathematics and his/her other subjects.	4.08	HP
5. I monitor the amount of time my child spends on math at home.	3.86	HP
Composite Mean Rating	**4.06**	**HP**

Legend

Range of Means	Descriptive Interpretation
4.51 - 5.00	Very Highly Practiced (VHP)
3.51 - 4.50	Highly Practiced (HP)
2.51 - 3.50	Moderately Practiced (MP)
1.51 - 2.50	Slightly Practiced (SP)
1.00 - 1.50	Not Practiced (NP)

Based on their mean ratings, which range from 3.86 to 4.25, it can also be noted that the parents Highly Practiced their specific roles of checking their children's homework, spending time talking with their children about their progress in math, requiring their children to show them the results on all their math assignments, allowing their children to keep a balance between mathematics and their children's other subjects, and monitoring the amount of time their children spend on math at home. The results imply that parents have open, good, and caring relationships with their children. They listen, ask questions and opinions, and offer praises and support. They set time to check their whereabouts to ensure that the Mathematical tasks assigned to them are fully accomplished.

What the parents are doing conforms to the advice of the Centers for Disease Control and Prevention (2012) that when parents make a habit of knowing about their teens' activities, companions, and whereabouts, and set clear expectations for behavior with regular check-ins to be sure these expectations are being met, they can reduce their teens' risks.

Indeed, parents are a powerful influence in the lives of their children's learning. The monitoring role of parents guarantees that children do what is right, what is expected of them, and what is necessary to become Mathematics achievers who can apply Mathematical principles and processes in solving real-life situations or encounters.

Mathematics Content Advisor

Considering the extent to which the parents practice their parental role as mathematics content advisor, their mean ratings on the five indicators and the composite mean rating are reflected in Table 2d.

Table 2e: Parents' extent of practice in their role as mathematics learning counselor.

Indicators	Mean Rating	DI
1. I feel I can help my child solve problems from math class.	3.67	HP
2. I hink I know enough about mathematics to help my child	3.51	HP
3. I often discuss with my child how math is used in our everyday life	3.82	HP
4. I make an effort to understand the math my child is studying.	3.94	HP
5. I often help my child to do math homework.	3.75	HP
Composite Mean Rating	**3.74**	**HP**

Legend

Range of Means	Descriptive Interpretation
4.51 - 5.00	Very Highly Practiced (VHP)
3.51 - 4.50	Highly Practiced (HP)
2.51 - 3.50	Moderately Practiced (MP)
1.51 - 2.50	Slightly Practiced (SP)
1.00 - 1.50	Not Practiced (NP)

It can be noted that generally, the parents Highly Practiced their role as Mathematics content advisor as indicated by the composite mean rating of 3.74. This implies that parents endeavor to learn the content of the subject that their children are studying. Despite having learned the contents many years back, they manage to relearn them to ensure that when their children ask for technical assistance, they can extend help to them. Such finding is confirmed by the mean ratings of the specific indicators, which range from 3.51 to 3.94, indicating that the parents Highly Practiced their specific roles of helping their children solve problems from Math class because they strongly believe that they know enough about Mathematics to help their children, often discussing with their children how math is used in their daily lives, making an effort to understand the math that their children are studying and helping their children in doing their homework in math.

The findings could mean that parents assist their children. Should they have content difficulty in Mathematics, they exert efforts to ensure that their children's assignments are fully accomplished, and the lessons are understood by discussing with them because they believe that their role as a content advisor is significant to clarify, redirect, and strengthen learning.

Ntenake (2018) explained that learners whose parents are involved in learning the content of the subject are active and ready to learn. They learn to be punctual from a young age and persistent, as the parents would continuously inquire about their progress and not want to disappoint them.

As also claimed by Jay et al. (2018), parents who are directly involved in the content of children's homework could positively affect their children's achievement.

Mathematics Learning Counselor

Displayed in Table 2e are the mean ratings of the parents in performing the specific roles and the composite mean rating indicating the extent to which they practice their parental role as mathematics learning counselor. It can be noted from the table on the whole that parents *Highly Practiced* their being mathematics learning counselor, as evidenced by the composite mean rating of 3.80. This result implies that parents fully exercise the role of counselors to assess their children's needs, abilities, and potentials in becoming critical thinkers and problem-solvers so that appropriate strategies could be employed to make learning Mathematics engaging and joyful for their children.

A closer look at the mean ratings of the parents on their extent of practice of the specific roles, which range

Table 2e: Parents' extent of practice in their role as mathematics learning counselor.

Indicators	Mean Rating	DI
1. I apply strategies for helping my child overcome weaknesses in math.	3.80	HP
2. I gather information about the approaches used to teach math at my child's school.	3.70	HP
3. I explore good approaches for helping my child learn different math topics.	3.78	HP
4. I recognize my child's strengths and weaknesses in learning math.	3.95	HP
5. I match my expectations with my child's potential.	3.75	HP
Composite Mean Rating	**3.80**	**HP**

Legend

Range of Means	Descriptive Interpretation
4.51 - 5.00	Very Highly Practiced (VHP)
3.51 - 4.50	Highly Practiced (HP)
2.51 - 3.50	Moderately Practiced (MP)
1.51 - 2.50	Slightly Practiced (SP)
1.00 - 1.50	Not Practiced (NP)

from 3.70 to 3.95, it is worthy to note that they *Highly Practiced* the roles of applying strategies for helping their children overcome their weaknesses in math, gathering information about the approaches used to teach math at their children's school, exploring good approaches for helping their children learn different math topics, recognizing their children's strengths and weaknesses in learning math, and matching their expectations with their children's potential. With these findings, parents see to it that their children feel confident in their ability to do Mathematics and value their every learning experience so that they can decide clearly and reasonably as they grow older. Furner (2017) argued that when children are on the right disposition toward Mathematics, they can make career choices better.

Moreover, the findings indicate that parents endeavor to know and understand the weaknesses of their children so that they create conditions that will keep their children learn more effectively and experience success in learning Mathematics. As Ceka and Murati (2016) put it, when parents involve themselves in the education process of their children, usually the outcome can be qualified as a positive and encouraging one.

Learners' Attitudes Towards Mathematics

The learners' attitudes towards Mathematics regarding the subscales of anxiety, confidence, enjoyment, and benefits/value. The results of their self-assessments, as indicated by their mean ratings, are displayed in Tables 3a, 3b, 3c, 3d, and 3e.

Anxiety

Table 3a shows the mean ratings of the learners on the different indicators of anxiety. Based on the results, it can be noted that the learners have a *Moderately Favorable* attitude towards Mathematics along with anxiety, as indicated by the composite mean rating of 3.12. This result suggests that the learners somewhat have an emotional response towards mathematics, experiencing negative reactions to mathematical learning.

This response impacts their attitude and motivation to learn Mathematics, consequently on their achievement (Getahun *et al.*, 2016). Specifically, their moderate level of anxiety is clearly shown by the mean ratings ranging from 2.93 to 3.38, where they claimed that they feel nervous in working with mathematics, have a sinking feeling when they think they learn math, consider that learning is frustrating, feel insecure about asking math questions in their math classes, and get nervous when their math teacher is in their class.

These findings suggest that learners are somehow stressed or anxious when they do Mathematics. This feeling could be explained by Sokolowsi and Ansari (2017). They said that children are more likely to develop Math anxiety when they struggle with learning numbers when they are very young or when they experience certain kinds of social situations that influence their thoughts or feelings, two of which are peer pressure and teachers' attitudes. Hoorfar and Taleb (2015) established that Math anxiety is negatively correlated with metacognitive knowledge, which is the ability to reflect, understand, and control one's learning. This means that the more anxious the students are, the less metacognitive knowledge they possess in doing Mathematics.

Table 3a: Learners' attitudes towards Mathematics along with anxiety

Indicators	Mean Rating	DI
1. Working math makes me nervous	3.38	U/MF
2. I get a sinking feeling when I think of learning math.	3.22	U/MF
3. Learning math is frustrating.	3.03	U/MF
4. I feel insecure about asking math questions in class.	3.03	U/MF
5. I get nervous when a math teacher is in class.	2.93	U/MF
Composite Mean Rating	**3.12**	**U/MF**

Legend

Range of Means	Descriptive Interpretation
4.51 – 5.00	Strongly Agree (SA)/Very Highly Favorable (VHF)
3.51 – 4.50	Agree (A)/Highly Favorable (HF)
2.51 – 3.50	Undecided (U)/Moderately Favorable (MF)
1.51 – 2.50	Disagree (D)/Slightly Favorable (SF)
1.00 – 1.50	Strongly Disagree (SD)/Unfavorable (UF)

Confidence

Regarding the attitudes of the learners towards Mathematics along with confidence, it can be gleaned from Table 3b that the mean ratings of the learners on the different indicators of confidence range from 3.51 to 3.88, which all fall within the range 3.51 – 4.50 with a descriptive interpretation of Highly Favorable. These indicate that the learners have a high level of confidence in Mathematics as they claimed that Math does not scare them at all and they have self-confidence in learning math. With this, they have the confidence in taking a math

Table 3b: Learners' attitudes towards Mathematics along with confidence

Indicators	Mean Rating	DI
1. Math does not scare me at all.	3.54	A/HF
2. I have self-confidence in learning math.	3.88	A/HF
3. I have confidence in taking math test.	3.82	A/HF
4. I can solve math problem within a given time.	3.51	A/HF
5. I am able to solve math problems without difficulty.	3.36	U/MF
6. I have confidence in asking math questions in class.	3.62	A/HF
7. I am able to answer math questions in class.	3.82	A/HF

Legend

Range of Means	Descriptive Interpretation
4.51 – 5.00	Strongly Agree (SA)/Very Highly Favorable (VHF)
3.51 – 4.50	Agree (A)/Highly Favorable (HF)
2.51 – 3.50	Undecided (U)/Moderately Favorable (MF)
1.51 – 2.50	Disagree (D)/Slightly Favorable (SF)
1.00 – 1.50	Strongly Disagree (SD)/ Unfavorable (UF)

test, can solve math problems in a given time. Moreover, the learners disclosed that they have Highly Favorable attitudes towards mathematics as manifested by their having confidence in asking and answering math questions in class. These findings imply that the learners are conscious of what they are capable of and can determine quite accurately what they know and what they do not know.

The composite mean of 3.65 suggests that generally, the learners have Highly Favorable attitudes towards mathematics along with confidence. This result could mean that the learners have high self-confidence believe in their abilities to be successful in learning mathematics, thus overcoming the fear of failing. It could also imply that these learners are ready to take on mathematical challenges, allowing them to succeed in learning. According to Perkins (2018), self-confidence is related to success, achievements in education, conciliation, and a person's well-being, among other things, and self-efficacy, self-esteem, and self-compassion are the three factors that can affect the level of self-confidence of any individual.

Enjoyment

Considering the learners' attitudes towards mathematics along with enjoyment, Table 3c shows the mean ratings of the different indicators and the composite mean.

Table 3c: Learners' attitudes towards Mathematics along with enjoyment.

Indicators	Mean Rating	DI
1. I enjoy doing math.	3.97	A/HF
2. Math word problems Fascinate me.	3.67	A/HF
3. I look forward to a math class.	3.77	A/HF
4. Math is very interesting to me.	3.84	A/HF
5. I enjoy learning math with my friends.	3.99	A/HF
6. I feel comfortable working with math.	3.74	A/HF
Composite Mean Rating	**3.83**	**A/HF**

Legend

Range of Means	Descriptive Interpretation
4.51 – 5.00	Strongly Agree (SA)/Very Highly Favorable (VHF)
3.51 – 4.50	Agree (A)/Highly Favorable (HF)
2.51 – 3.50	Undecided (U)/Moderately Favorable (MF)
1.51 – 2.50	Disagree (D)/Slightly Favorable (SF)
1.00 – 1.50	Strongly Disagree (SD)/ Unfavorable (UF)

As indicated by their mean ratings ranging from 3.67 to 3.97, the learners have Highly Favorable attitudes toward mathematics as they strongly agreed that they enjoy doing math and are fascinated by math problems. Because they find enjoyment in Mathematics and consider it an interesting subject, they enjoy learning Mathematics with their friends and feel comfortable working with it; hence, they look forward to their math class. Students' enjoyment while learning can influence their behavior or cognitive aspect of attitude (Syyeda, 2016).

The composite mean of 3.83, which indicates a Highly Favorable attitude along with enjoyment, confirms Kupari and Nissinen's (2013) statement that learners learn Mathematics because they find it enjoyable and interesting. They further claimed that this enjoyment affects both the degree and continuity of engagement in learning and the depth of understanding. The more students enjoy doing mathematics, the more they are likely to engage in problem-solving, thus enhancing their learning and performance.

Benefit/Value

For one to develop an interest in doing and learning mathematics, he/she has to see the benefits he/she can derive from doing it. The mean ratings of the learners regarding their attitudes towards mathematics along with benefit/value are displayed in Table 3d.

As revealed by their mean ratings, which range from 4.30 to 4.46, the learners have a Highly Favorable attitude towards Mathematics as clearly manifested by their strong agreement on the different indicators of benefit/value. Thus, the learners have Highly Favorable attitudes towards Mathematics as they disclosed that they consider

Table 3d: Learners' attitudes towards Mathematics along with benefit/value.

Indicators	Mean Rating	DI
Math is important in everyday life.	4.43	A/HF
I want to develop my math skills.	4.46	A/HF
Math is a very necessary subject.	4.33	A/HF
Knowing math will help me earn a living.	4.38	A/HF
I will need math for future work.	4.43	A/HF
Math helps people to make good decision.	4.30	A/HF
Math improves my thinking capacity.	4.32	A/HF
Math is important for other subjects.	4.30	A/HF
Composite Mean Rating	**4.37**	**A/HF**

Legend

Range of Means	Descriptive Interpretation
4.51 – 5.00	Strongly Agree (SA)/Very Highly Favorable (VHF)
3.51 – 4.50	Agree (A)/Highly Favorable (HF)
2.51 – 3.50	Undecided (U)/Moderately Favorable (MF)
1.51 – 2.50	Disagree (D)/Slightly Favorable (SF)
1.00 – 1.50	Strongly Disagree (SD)/ Unfavorable (UF)

Math a very necessary subject and important for their other subjects. Also, they see the importance of math in their daily lives, and so they are motivated to develop their math skills to improve their thinking capacity, enabling them to make good decisions. Moreover, they strongly agreed that they need math in their future work because they know that math will help them earn a living. Syyeda (2016) explained that if students recognize the importance of mathematics in their lives, they will become motivated to study, practice, and learn the subject. With this, learners could be viewed as highly motivated for seeing the significance of Mathematics to construct meanings of their way of life beyond the numbers and formulas.

The composite mean of 4.37 clearly indicates that generally, the learners have Highly Favorable attitudes towards mathematics along with benefit/value. This could mean that learners' recognition of the value of Mathematics in their lives and future careers encourages them to strive to learn and overcome their weaknesses. As Adelson and McCoach (2011) mentioned, knowledge about the benefits/value of Mathematics influences students' attitude towards the subject.

Learners' Level of Performance in Mathematics

The level of performance of learners in Mathematics. The distribution of learners according to their general average is reflected in Table 4.

It can be noted from the table that more than one-third of the total number of pupil-respondents have *Outstanding performance* in mathematics (110 or 33.54%), having garnered a general weighted average within the range 90 – 100, and almost the same number of pupils performed *Very Satisfactorily* with a general average that falls within the range 85 – 89 (117 or 35.67%). DepEd (2012) described that students at these levels have exceeded the core requirements or have developed the basic knowledge, skills, and core understandings, which they can transfer automatically, flexibly, and independently through authentic performance tasks. However, some of the learners *Showed Satisfactory* (72 or 21.95%) and Fairly Satisfactory (29 or 8.84%), whose general averages fall within the ranges 80 – 84 and 75–79, respectively.

Table 4: Distribution of learners according to their level of performance in Mathematics.

General Average	Descriptive Interpretation	f	%
90 - 100	Outstanding (O)	110	33.54
85 - 89	Very Satisfactory (VS)	117	35.67
80 - 84	Satisfactory (S)	72	21.95
75 - 79	Fairly Satisfactory (FS)	29	8.84
Below 75	Did Not Meet Expectations (DNME)	0	0.00
Total		**328**	**100.0**

Mean General Average = 86.64 (VS) Standard deviation (sd) = 5.16

These learners at these levels have acquired the minimum or have developed the fundamental knowledge and skills and core understanding with little to maximum guidance from the teacher and/or with peers to complete a task (DepEd, 2012). Generally, the learners have *Very Satisfactory* performance in mathematics as revealed by the mean general average of 86.84, and the general averages of the pupils showed an average distance of 5.16 from their mean general average. This general average implies that the learners have acquired the prerequisite knowledge and have demonstrated mastery of the cognitive processes involved in performing authentic mathematical learning endeavors.

Relationship Between Parents' Socio-demographic Characteristics and Their Extent of Practice of Parental Roles

The relationship between each of the parents' socio-demographic characteristics and their extent of practice of their parental roles as motivator, resource provider, monitor, mathematics content advisor, and mathematics learning counselor. The computed coefficients of correlation are displayed in Table 5.

It can deduced from the results of the correlation analysis that family income of the parents is not significantly related to their extent of practice of parental roles as motivator (r=.021, p =.909), resource provider (r =-.038, p = .487), monitor (r = .030, p=.590), Mathematics content adviser (r = .022, p = .692) and Mathematics learning counselor (r =.043, p =.438) as evidently shown by their respective coefficients of correlation ranging from -.038 to .043 with associated probabilities that are all greater than the .05 level of significance.

These imply that their family income did not significantly influence how the parents performed their parental roles. Further, it suggests that parents remain involved in their children's academic activities regardless of income status. This result lends support to the findings of Al-Matalka (2018) that parental involvement at home is present regardless of parental income status. Johnson (2016) cited that socio economic status does not have to be associated with parental involvement.

As regards the number of children as one of the socio-demographic characteristics, it can be inferred from the obtained coefficients of correlation that it is significantly related to the extent to which the parents performed their parental role as motivator as revealed by the obtained. coefficient of correlation of .357 with an associated probability of .000 which is less than the .01 level of significance.

Table 5: Coefficients of correlation between each of the socio-demographic characteristics of parents and their extent of practice of parental roles.

Parental Roles	Socio-demographic Characteristics	
	Monthly Income	**No. of Children**
Motivator	.021	.357**
	(p = .909)	(p = .000)
Resource Provider	-.038	-.018
	(p = .487)	(p = .741)
Monitor	.030	-.060
	(p = .590)	(p = .278)
Mathematics content Adviser	.022	-.013
	(p = .692)	(p = .817)
Mathematics Learning Counselor	.043	.001
	(p = .438)	(p = .994)

***p < .01*

The significant positive correlation indicates that parents with more children tend to have a greater extent of practice of their role as a motivator. This result is understandable since more children could mean parents' greater responsibility to ensure that they are well-motivated to do Mathematics. Cai *et al.* (2011) explained parents contribute to their children's emotional development and behavior when they get involved. However, a critical analysis on the other coefficients of correlation which range from -.060 to .001 with associated probabilities that are all greater than the .05 level of significance, it can be inferred that number of children is not significantly related to the parents' extent of practice of their roles as resource provider, monitor, mathematics content adviser and learning counselor.

This finding suggests that parents with more children perform these roles just as eager as those parents with fewer children. Research findings of Bezeveggis (2012) showed that parents with a higher educational level tended to reinforce their children's behavior more while they adopted a dialectical communication model with them. They praised their children for positive behaviors, they had good communication skills, and they created an environment with cognitive stimuli that contributed to children's development.

Relationship Between Parents' Extent of Practice of Parental Roles and Learners' Attitudes Towards Mathematics

The relationship between the parents' extent of practice

of their parental roles and the learners' attitudes towards Mathematics. The computed coefficients of correlation are presented in Table 6a. Based on the results, it can be inferred that parents' extent of practice of their parental role as monitor is significantly but negatively related to learners' level of anxiety in dealing with Mathematics are revealed by the computed correlation coefficient of -.113, which is significantly at the .05 probability level. This implies that the greater the extent to which the parents practice monitoring their children, the lower the level of mathematics anxiety of their children. This is so because when they monitor their children when they are doing their mathematics lessons or activities, their children could feel the support they are extending to them, which greatly reduces their anxiety level. This finding agrees with the claim of Farr (2015) that monitoring efficiently the activities of children can affect their self-concept, self-esteem, and general attitudes towards mathematics. Meanwhile, it can also be deduced from the results that the parents' extent of practice of their parental roles as motivator, resource provider, mathematics content adviser, and learning counselor is not significantly related to the learners' level of Mathematics anxiety. These are evidently shown by the computed coefficients of correlation whose associated probabilities are all greater than the .05 level of significance. This implies that Mathematics anxiety is not affected by the extent of practice of parents on these roles since there could be other factors that may be causing this negative emotion towards Mathematics

Table 6a: Coefficients of correlation between parents' extent of practice of parental roles learners' attitudes towards Mathematics.

Parental Roles	**Attitude Towards Mathematics**				
	Anxiety	**Confidence**	**Enjoyment**	**Benefits**	**Overall**
Motivator	-.051	.156**	.169**	.127*	.150**
	(p=.358)	(p=.005)	(p=.002)	(p=.022)	(p=.007)
Resource Provider	-.038	.197**	.155**	.083	.154**
	(p=.358)	(p=.000)	(p=.005)	(p=.135)	(p=.007)
Monitor	-.113*	.239**	.212**	.177**	.184**
	(p=.041)	(p=.000)	(p=.000)	(p=.001)	(p=.001)
Mathematics Content Adviser	-.052	.225**	.212**	.161**	.208**
	(p=.348)	(p=.000)	(p=.000)	(p=.003)	(p=.000)
Mathematics Learning Counselor	-.071	.202**	.172**	.112*	.154**
	(p=.200)	(p=.000)	(p=.002)	(p=.043)	(p=.005)

***p < .01, *p < .05*

As regards learners' level of confidence in doing Mathematics, it can be noted from the results that such is significantly related to the parents' extent of practice of each their parental roles as motivator (r =.156, p=.005), resource provider (r = .197, p = .000), monitor (r=.239, p =.000), Mathematics content adviser (r=.225, p=.000), and learning counselor (r =.202, p=.000) which are all significant at the .01 level of significance. These imply that the greater the extent of practice of parents in doing their parental roles, the higher the level of mathematics confidence of their
children in doing mathematics. This study is supportive of the findings of Farr (2015) that parental involvement could provide a way to facilitate children's confidence in Mathematics, subsequently improving learning outcomes. Similarly, it can be gleaned from the table that the learners' level of enjoyment in doing mathematics is significantly related to their parents' extent of practice of each of their parental roles as motivator (r=.169, p =.000), resource provider (r = .155, p = .000), monitor (r =.212, p =.000), mathematics content adviser (r= .212, p =.000), and mathematics learning counselor (r= .172, p =.000) as evidently shown by the computed coefficients of correlation with associated probabilities which are all less than the .01 level of significance. These results indicate that the greater the extent to which the parents practice their parental roles, the higher is the level of enjoyment of their children in doing mathematics. Daabell (2018) explained that what parents do with their children at home affects their children's level of enjoyment.
He added that when parents interact with their children to promote Maths, positive things, including self-enjoyment, will happen. Considering the learners' mathematics attitudes in terms of the benefits they derived from doing Mathematics, it can be inferred from the computed coefficients of correlation displayed in Table 16 disclose that such is significantly related to their parents' extent of practice of their parental roles as motivator (r = .127, p = .022), monitor (r = .177, p = .000), Mathematics content adviser (r = .161, p = .000) and Mathematics learning counselor (r = .112, p = .043).
These results suggest that the greater the extent to which the parents practice their parental roles as motivator, monitor, mathematics content adviser, and learning counselor, the more favorable are the attitudes of their children towards Mathematics as regards the benefits

they derived from doing their lessons and activities in the subject. However, the learners' attitudes towards Mathematics in terms of benefits are not significantly related to the parents' extent of practice of their parental role as resource provider (r = .083, p = .135), as clearly shown by the correlation coefficient whose associated probability is greater than the .05 level of significance. Taking the learners' Mathematics attitudes as a whole, it can be deduced from the results that is significantly related to their parents' extent of practice of their parental roles as motivator (r =.150, p =.000), resource provider (r = .154, p = .000), monitor (r =.184, p =.000), Mathematics content adviser (r=.2.08, p=.000) and Mathematics learning counselor (r =.154, p=.000) as evidenced by their respective coefficients of correlation whose associated probabilities as all less than the .01 level of significance.

These findings indicate that the greater the extent to which the parents practice their parental roles as motivator, resource provider, monitor, Mathematics content adviser, and learning counselor, the more favorable the learners' attitudes towards Mathematics. This finding is consistent with Johnson's study (2015) that students who receive greater support from parents in Maths have better attitudes and self-efficacy toward Math.

Relationship Between Parents' Extent of Practice of Parental Roles and Learners' Mathematics Performance

The relationship between parents' extent of practice of their parental roles and learners' Mathematics performance. The computed coefficients of correlation are displayed in Table 6b. A critical analysis of the coefficients of correlation discloses that learner's Mathematics performance is significantly related to their parents' extent of practice of their parental roles as monitor (r = .193, p = .000), Mathematics content adviser (r = .185, p = .001) and Mathematics learning counselor (r = .180, p = .002).

This implies that the greater the extent to which the parents practice their parental roles as monitor, Mathematics content adviser, and learning counselor, the better their children's mathematics performance. Thus, when parents monitor their children while doing their mathematics lessons and activities and serve as a content adviser and learning counselor, their children are properly guided and consequently do their Mathematics better.

This finding runs parallel to what Hunt and Hu (2011) noted in their research that parents' roles and involvement in their children's mathematical learning could lead to a heightened performance in mathematics. However, it can be noted from the table that learners' performance is not significantly related to parents' extent of practice of their parental roles as motivator (r=.087, p=.117) and resource provider (r=.104, p=.059). Those who have less performed these roles would have the same impact on children's academic achievement as their counterparts.

Table 6b: Coefficients of correlation between parents' extent of practice of parental roles and learners' mathematics performance.

Parental Roles	Learners' Performance in Mathematics
Motivator	.087 (p=.117)
Resource Provider	.104 (p=.059)
Monitor	.193** (p=.000)
Mathematics Content Adviser	.185** (p=.001)
Mathematics Learning Counselor	.180** (p=.001)
**p < .01, *p < .05	

Relationship Between Learners' Attitudes Towards Mathematics and Their Mathematics Performance

The results of the relationship between learners' attitudes towards Mathematics and their performance in the subject. The obtained coefficients of correlation are reflected in Table 7. It can be deduced from the results that learners' performance in Mathematics is significantly related to their attitudes towards the subjects along the domain of anxiety (r=.-311, p=.000), confidence (r = .363, p = .000), enjoyment (r =.364, p = .000) and benefits (r =.190, p= .000) as well as their overall attitude towards the subject (r = .191, p=.000) as revealed by the computed coefficients of correlation which are all significant at the .01 level of significance.

The significant negative correlation between learners' performance in mathematics and anxiety indicates that learners with a lower level of anxiety in doing Mathematics tend to perform better in the subject. More specifically, as the level of academic anxiety increases, academic achievement decreases and vice-versa. This confirms the finding of Shakir (2014) about the inverse relationship between academic achievement and academic anxiety. As claimed by Gichohi (2019), high anxiety levels are a cursor to dismal academic achievement. Also, Afolayan *et al.* (2015) explained that students performed better when they are not anxious than when they are anxious. Hence, learners need to maintain optimal state of health and mind for better academic achievement. Moreover, the positive

correlation indicates that learners with a higher level of confidence and enjoyment in doing Mathematics and very much aware of the benefits they derived from doing Mathematics tend to perform better in the subject. This confirms the finding of Shakir (2014) about the inverse relationship between academic achievement and academic anxiety. As claimed by Gichohi (2019), high anxiety levels are a cursor to dismal academic achievement.

Also, Afolayan *et al.* (2015) explained that students performed better when they are not anxious than when they are anxious. Hence, learners need to maintain optimal state of health and mind for better academic achievement. Moreover, the positive correlation indicates that learners with a higher level of confidence and enjoyment in doing Mathematics and very much aware of the benefits they derived from doing Mathematics tend to perform better in the subject.

This finding bears out with the idea of Ciftci and Yildiz (2019) that self-confidence has a significant effect on mathematics achievement. Arshad *et al.* (2015) argued that high level of confidence leads to good academic performance. Also, Akbari and Sahibzada (2020) explained that self-confidence can lead students to improved participation, joyful learning, reduced test anxiety, increased interest in goal seeking, and growth of comfort with their lecturers and classmates.

Table 7: Coefficients of correlation between learners' attitudes towards mathematics and their performance.

Attitudes Towards Mathematics	**Performance in Mathematics**
Anxiety	-.311**
	(p=.000)
Confidence	.363**
	(p=.000)
Enjoyment	.364**
	(p=.000)
Benefits	.190**
	(p=.000)
Overall	.191**
	(p=.000)

***p < .01*

The finding also provides support to the claim of Capuno *et al.* (2019) that if the respondents perceived a higher value for math, the better they perform in the subject. Also, it leads support to the idea of Kountouri *et al.* (2013) that the value that students give to mathematics can work as a protective factor against mark decline and all the related consequences for their future career. Overall, it can be concluded based on the findings that the learners' attitudes towards Mathematics greatly enhance their performance in the subject. Capuno *et al.* (2019) pointed out that students' attitudes towards mathematics would affect how well they perform in the subject and how often they engage in the subject.

Predictors of Learners' Mathematics Performance

The results of multiple linear regression analysis using the stepwise regression procedure. It can be gleaned from Table 8a that the computed F-value is 21.237 with an associated probability of .000. The estimated regression equation is adequate, and the explained variance of learners' mathematics performance that is accounted for the significant predictors is 20.80%. This suggests that mathematics performance has a strong significant relationship with the variables and that 20.80% of the change in the learner's performance could be attributed to these significant predictors.

Table 8a: Analysis of Variance table for the results of the stepwise multiple linear regression analysis.

Source of Variation	**Sum of Squares**	**df**	**Mean Square**	**F-value**	**P**
Regression	1,815.397	4	453.849	21.237**	.000
Error	6,902.652	323	21.370		
Total		**8,718.049**			
R^2 = 20.80%					

***p < .01*

A critical analysis of the regression coefficients displayed in Table 9b, it can be inferred that the significant predictors of learners' Mathematics performance are enjoyment (b = 1.271, t = 2.466, p = .014), anxiety (b = -1.153, t-value = -4.221, p = .000), confidence (b = 1.159, t-value = 2.239, p = .000) and Mathematics learning counselor (b = .666, t-value = 2.009, p = .045). Thus, the estimated regression equation is: Learner's Mathematics Performance =78.467 +1.271Enjoyment – 1.153Anxiety + 1.159Confidence + .656.

Mathematics Learning Counselor

The regression coefficients indicate that on average, learners' Mathematics performance increases by 1.271 for every unit increase on the level of enjoyment in doing Mathematics considering the other variables constant, decreases by 1.153 for every unit increase on the level of anxiety considering the other variables constant; increases by 1.159 for every unit increase on the level of confidence considering the other variables constant; and increases by .666 for every unit increase on the parents' extent of practices of parental role as Mathematics learning counselor considering the other variables constant. On the other hand, the other independent variables like monthly Income, number of children, parents' extent of practice of their parental roles as motivator, resource provider, monitor and Mathematics content adviser, as well as learners attitudes towards mathematics along benefits are not significant predictors of learners' Mathematics performance.

Table 8b: Coefficients of the significant predictors of learners' mathematics performance

Predictors	Coefficient (b)	t-value	P
(Constant)	78.647	36.312	.000
Enjoyment	1.271	2.466*	.014
Anxiety	-1.153	-4.221**	.000
Confidence	1.159	2.239**	.000
Mathematics Learning Counselor	.656	2.009*	.045

***p < .01, *p < .05*

CONCLUSIONS

Based on the results of this study, it can be concluded that parents highly practiced their parental roles to help their children learn Mathematics. On the other hand, the learners have highly favorable attitudes towards Mathematics, and they performed very satisfactorily in the subject.

The number of children is a factor that could influence the extent of practice of the parents to perform their parental role as a motivator, while family income is not a factor in performing any of their parental roles.

Also, learners' attitudes towards Mathematics are significantly affected by their parents' extent of practices of parental roles. Their level of anxiety in dealing with Mathematics is greatly reduced when their parents monitor them while they are doing their Mathematics.

Moreover, learner's Mathematics performance is significantly affected by their parents' extent of practice of their parental roles as monitor, Mathematics content adviser, and Mathematics learning counselor.

In addition, learners' performance in Mathematics is significantly affected by their attitudes towards the subject. That is, learners perform better in mathematics when they have a low level of anxiety in doing Mathematics, have a high level of confidence, find enjoyment in doing Mathematics, and know the benefit/value they derived from learning Mathematics.

Finally, the Mathematics performance of the learner can be predicted through their attitudes towards the subject, more particularly along with enjoyment, anxiety, and confidence together with their parents' extent of practice as Mathematics learning counselor.

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