DETERMINANTS IN MATHEMATICS PERFORMANCE OF GRADE 10 STUDENTS IN THE MIDST OF COVID-19 PANDEMIC

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Abstract *– This research determined the factors affecting the academic performance of the Grade 10 students in Mathematics during the COVID-19 pandemic at Tungkop National High School, TungkopMinglanilla, Bankal National High School, Lapu-Lapu City Cebu, and Inabanga High School, Bohol Division.It employed a descriptive correlational research design. Three factors affecting the academic performance of Grade 10 learners in Mathematics during the COVID-19 pandemic were student-related, parent-related, and home-related. It is concluded that home-related factors moderately affected the performance of the learners. The researchers strongly recommend the enhancement plan to address the student's needs and gaps in this new normal of education.*
Keywords*: Teaching Mathematics, Mathematics Performance, DescriptiveCorrelational-Research, Cebu, and Bohol*

INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic brought every individual's life to a standstill upon implementing the lockdown(Amin et al., 2022). Its impact has brought a sudden change in education and has affected the lives of students, teachers, school administrators, and parents. Due to the widespread implementation of the lockdown, the traditional teaching method has shifted by replacing distance learning such as a blended learning system, online teaching, and modular approach(Kumar et al., 2021; Ożadowicz, 2020; Rahman, 2021; Singh et al., 2021). The kind of instruction affects students' performance specifically in all subjects. According to (Lin, 2022) an empirical evidence suggested that students learned math more effectively in traditional face-to-face classes compared to online learning. On the other hand, a study of (Spitzer &Musslick, 2021) concluded that online learning platform maybe effective in preventing educational losses relative to schools shutdown.

The Department of Education in the Philippines implemented blended, online, and modular for the continuity of classes in the new normal(Ancheta & Ancheta, 2020). The said method needs a collaborative effort from the teachers and parents to help the student's educational performance. Agayon et al.(2022) noted that the need for parents' support and guidance to the students is essential to overcome the struggles they are experiencing now with the unfamiliar method used in education.

With modular distance learning, the students could acquire grades ranging from satisfactory to very satisfactory; they have also shown different learning styles toward Mathematics. The teachers are

well-versed in delivering their lessons, as shown in their various teaching strategies. Parents' lack of financial resources has limited their capability to improve home facilities for children's learning needs(Agaton & Cueto, 2021). In the study of Anzaldo (2021), teachers like modular distance learning, because it accommodates learners who do not have the gadgets and internet connection needed in the online class. MDL allows students to learn and work at their own pace, giving the learner ample time to read/study the lesson. However, the study by Schult and Linder (2021) shows that students spent less time learning during the implementation of distance learning. Additionally, teachers face organizational and technological challenges in remote learning environments.

The study by Alvarez (2020) revealed that distance learning during the pandemic is not accessible due to the existing problems with internet access, the financial crisis of the parents, and affective support are also an aspect that would affect learners' academic achievement. Additionally, it was found that not all parents/guardians can teach their children the topics in the module, and learners find it hard to answer the issues in the module without the assistance of their teacher (Anzaldo, 2021).

The study by Jelinska and Paradowski (2021) reveals the importance of teachers' supportive and reassuring attitude during the pandemic. Faculty support has been positively linked to indicators of student behavioral engagement, including increased participation in school activities, academic motivation, and depressive disruptive behavior. That teacher with related knowledge of distance learning can adapt and work in the advanced education area and utilize ongoing coordinated modalities.

Module enabled in-service teachers to experience social, cognitive, and teaching presences through synchronous and asynchronous discussions with peers and facilitators and a teaching presence by submitting their inquiries and assignments online for facilitators to provide answers and feedback. The main obstacles to the module's integration were limited availability of technology, slow speed, and unaffordable cost when available. With increased broadband connectivity, Module offers the prospect of diversifying b-learning experiences to support teachers' professional learning outcomes and throughput for distributed populations of practicing mathematics teachers, particularly (Ndlovu & Mostert, 2018).

Students had a positive perception of the use of Moodle and were happy to learn mathematics in an online mode rather than a face-to-face mode. It was suggested that Moodle benefits tutors and students equally if used appropriately and systematically(Neupane, 2019). Results showed that the functionalities within the Moodle LMS were instrumental in improving conceptual understanding of mathematical functions(Mlotshwa et al., 2020).

In particular, Bankal National High School, Tungkop National High School and Inabanga High School in Bohol are implementing the modular distance learning method for the continuity of education. In modular distance learning, teachers provide and distribute the self-learning modules weekly and students complete the task and submit their output at the end of the week. Open communication is needed between the teacher and students and the teacher to parents/guardians as part of the norm to ensure and monitor the student's progress at home.

There are identified factors that affect students’ performance in mathematics. These factors are student –related factors, parent-related factors, and home-related factors. Student-related factors determined students' behaviors toward math with modular distance learning. Parent-related factors will affect the student's performance in mathematics, the way the parents assist their children with the activity in the modules, and the concept of parents on the way their children learn during this time. Home-related factors can affect the students' math performance, the perception of the students in learning math at home, and the facilities/ gadgets that the family has to support the educational needs of the learners during the pandemic.

With the sudden instructional change, the said factors could have affected students' mathematical performance in this modular distance learning. Thus, this paper determined the factors affecting the academic performance of the Grade 10 students during the time of the pandemic.

1. PURPOSE OF THE STUDY

This research determined the factors affecting the academic performance of the Grade 10 students in Mathematics during the COVID-19 pandemic at Tungkop National High School, Bankal National High School, and Inabanga High School as the basis for enhancement plans.

Specifically, this study answered the following sub-problems:

1. What is the profile of the respondents in terms of:
    1.1 age and gender;
    1.2 birth order;
    1.3 parents' educational attainment, and
    1.4 monthly family income?
2. What is the level of perceived factors affecting the performance in Mathematics of the respondents as to:
    2.1 student-related,
    2.2 parent-related, and
    2.3 home-related?
3. What is the level of academic performance of the respondents in Mathematics?
4. Is there a significant relationship between the perceived factors and the academic performance of the respondents in Mathematics?

2. MATERIALS AND METHODS

This section presents the research design, respondents, instrument, data gathering procedure, statistical data treatment, and scoring procedure.

2.1 Research Design

This study employed a descriptive correlation research design on the factors affecting the academic performance of Grade 10 learners in Mathematics during the COVID-19 pandemic. Quantitative Research was used to evaluate the problem by generating numerical data or data that can be transformed into usable statistics.

The data gathered leads to identifying critical variables used in the study. It determined how things should or can be improved through evaluative case studies, critique of the object or variable studied, testing possible ways to remove or correct an identified problem, and planning ways to improve the thing or process.

2.2Respondents

The students of Grade 10 at Tungkop National High School, Minglanilla, Cebu, Bangkal National High School, Lapu-Lapu City, and Inabanga High School, Bohol Division were the respondents of the study. The researchers used Slovin's formula to determine the sample size needed for the study, and randomly selected Grade 10 students from the respective schools. The respondent size per school is based on its category.

There were 185 respondents from Bangkal National High School, 66 respondents from Tungkop National High School and 65 Inabanga High School. These schools are mega schools or big schools in their division.

Young people develop physically and socially at this level and are exposed to different social stresses. Students have better learning about themselves as well as their talents and skills. It is also crucial for them to gain or lose confidence in themselves and their motivation. Students who are successful at this level, be it in academics, sports, or clubs, are usually more successful in later grades.

School isn't simply about obtaining good grades from 10th grade through senior year. Student study habits, organizational abilities, and time management affect their grades almost as much, if not more, than their IQ. For this reason, the students need to start planning and building sensible, practical habits that will last a lifetime. Accordingly, the Grade 10 respondents were chosen by the researchers as their experience with modular distance learning is relevant to the study and fits the researchers' time frame and resources.

2.3Instrument

A questionnaire through a survey is used to gather the data needed in the study, which consists of two parts. The first part consists of questions that elicit the profile of the subjects in terms of age, gender, ordinal rank among siblings, educational attainment of parents, and average monthly income. The second part is items categorized in the perception in Mathematics of Grade 10 students as student-related, parent-related, and home-related. The questionnaire was adopted in the study of Sintos (2018).

It made use of a 5 Likert scale, 1 which describes as Strongly Disagree, which demonstrates that the subject has disagreed about the perception in Mathematics towards his/her experience, as well as five as Strongly Agree, which also explains that the subject has agreed about the perception in Mathematics towards his/her experience. With this, the given instrument was modified to fit the study, and the content focused on the issues related to Math subjects.

2.4Data Gathering Procedure

Preliminary Stage. The researchers observed the safety health protocol in conducting the research. Afterward, a transmittal letter was sent to the school's division superintendent to ask permission to conduct the study. When the letter was approved, the researcher visited the principal's office to inform them of the intention to conduct a study at their school. The researchers and the principal agreed upon a schedule for the data gathering.

Data Gathering Stage. On the scheduled date, the researchers conducted an orientation thru google meet or zoom to the learners regarding the study's objective. A consent form was secured from the students before they were considered to participate in the study. Brief instructions were given on how to answer the survey questionnaire so that the learners could answer the questionnaires accurately. Furthermore, they had enough time to complete the questionnaires. The questionnaires' retrieval was tracked.

Post Data Gathering Stage. To validate the answers, the researchers conducted an informal interview with the students over the Internet, and the collected data was then processed per the study intention.

2.5Statistical Treatment

The tools that the researchers used in analyzing the data were the frequency count, percent, weighted mean, and Pearson-r. Frequency Count was used to determine the number of respondents in the same category regarding perception in math. Percent was used to show how a part relates to a whole and to represent the profile of math students, their ages, and their accomplishments in the subject. Weighted Mean was used to get the extent of the student's perception of the subject in Math. Pearson r was used to determine the degree of correlation between students' perceptions of the subject of Math.

3. RESULTS

This section presents the data gathered regarding the demographic profile of the respondents; the level of perceived factors affecting the performance in Mathematics of the respondents as to student-related, parent-related, and home-related; level of academic performance of the respondents in Mathematics; and test of significant relationship between the perceived factors and the academic performance of the respondents in Mathematics.

3.1 Age and Gender Profile of the Respondents

One of the essential factors in understanding respondents' perceptions of specific problems is their age and gender.

Table 1. Age and Gender of the Respondents

Age (in years)	Female		Male		Total	
	f	%	f	%	f	%
19 and above	4	1.27	8	2.53	12	3.80
17-18	36	11.39	39	12.34	75	23.73
15-16	156	49.37	73	23.10	229	72.47

Total	**196**	**62.03**	**120**	**37.97**	**316**	**100.00**

Table 1 shows 156 or 49.37 percent of female respondents aged 15-16 in all the environment, followed by 17-18 with 36 or 11.39 percent, for 19 and above 4 or 1.27 percent. For the overall male respondent age, 15-16 has 73 or 23.10percent, while 39 or 12.34 percent for age 17-18 and 8 or 2.53 percent for 19 and above. There are 196 or 62.03 percent, female respondents for the three environments and 120 male respondents or 37.97 percent.

3.2 Birth Order of the Respondents

The birth order can influence the perceived academic achievement of the respondents.

Table 2. Birth Order of the Respondents

Birth Order	f	%
Eldest	83	26.27
Second	66	20.89
Middle	69	21.84
Youngest	73	23.10
Only Child	25	7.91
Total	316	100.00

It can be seen in table 33 that in all the environments of study, 83 or 26.27 percent of the respondent are the eldest, followed by 73 or 23.10 percent are the youngest. Next in rank is the middle child with 69 or 21.84 percent, the second child has 66 or 20.89 percent, and the only child is 25 or 7.91 percent.

3.3 Parent's Highest Educational Attainment of the Respondents

The parents' educational attainment is critical to the learners' academic performance.

Table 3. Parents' Highest Educational Attainment

Educational Attainment	**Mother**		**Father**	
	f	%	f	%
College Graduate	62	19.62	65	20.57
College Level	40	12.66	34	10.76
High School Graduate	112	35.44	103	32.59
High School Level	41	12.97	52	16.46
Elementary Graduate	27	8.54	16	5.06
Elementary Level	28	8.86	33	10.44
None	6	1.90	13	4.11
Total	**316**	**100.00**	**316**	**100.00**

As revealed in Table 3, the overall highest educational attainment for mothers has 112 or 35.44 percent High School graduates, while 62 or 19.62 percent are College graduates. The High School Level has 41 or 12.97 percent, and College Level has 40 or 12.66 percent. A 28 or 8.86 percent for Elementary Level and 27 or 8.54 percent for Elementary Graduate. Those who have not attended school have 6 or 1.90 percent. The highest educational attainment for the father is High School Graduate with 103 or 32.59 percent, followed by College Graduate with 65 or 20.57 percent. At the same time, the High School Level has 52 or 16.64, after which is College Level with 34 or 10.76 percent. And for elementary graduates, there is 33 or 10.44 percent. There is 16 or 5.06 percent for the Elementary graduates, and lastly for those who have not attended school has 13 or 4.11.

3.4 Combined Family Monthly Income

Wages, salaries, self-employment earnings, and other sources of income are all included in the combined family monthly income.

Table 4. Combined Family Monthly Income

Monthly Income (in pesos)	f	%
Above 30,000	20	6.33
25,001-30,000	8	2.53
20,001-25,000	10	3.16
15,001-20,000	16	5.06
10,001-15,000	37	11.71
10,000 and below	225	71.20
Total	**316**	**100.00**

It is revealed in Table 4 that the overall Combined Family Monthly Income shows that 10,000 and below has 225 or 71.20 percent, followed by 37 or 11.71 percent for 10,001-15,000. While for Above 30,000 has 20 or 6.33 percent, and 16 or 5.06 percent for 15,001-20,000. Though only 10 or 3.16 percent for 20,001-25,000, last 8 or 2.53 percent for 25,001-30,000.

3.5 Level of Perceived Factors Affecting the Performance in Mathematics

The following tables displays the overall level of perceived factors affecting students' mathematics performance respondents in Tungkop National High School, Bankal National High School, and Inabanga High School. The perceived factors that were considered in this study are student-related factors; parent-related factors; and home-related factors.

3.5.1 Student-Related Factors

The attitudes of students toward mathematics affect their math grades.

Table 5. Level of Student-related Factors Affecting the Performance of the Respondents in Mathematics

S/N	Indicators	WM	Interpretation
1	Studying mathematics makes me feel nervous, especially during this pandemic.	3.99	High
2	I can solve mathematics problems without too much difficulty through educational websites and others.	3.01	Moderate
3	I am happier in a math class than in any other class compared to distance learning.	3.18	Moderate
4	I am willing to take more than the required amount of mathematics regardless of modality.	3.22	Moderate
5	I plan to take as much mathematics as I can during my education.	3.41	High
6	High school math courses would be very helpful no matter what I decide to study.	3.84	High
7	It would not bother me at all to take more math courses, even if it is a distance learning modality.	3.08	Moderate
8	I plan to take as much mathematics as I can during this pandemic.	3.24	Moderate
9	Mathematics is one of the most important subjects	3.90	

	for people to study, especially during this pandemic.		High
10	Mathematics is dull, particularly in this new normal.	3.49	High
Aggregate Mean		**3.43**	**High**

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

As revealed in Table 5, Studying mathematics makes me feel nervous, especially during this pandemic. It has the highest weighted mean of 3.99 with an interpretation of high, followed by; Mathematics is one of the most important subjects for people to study, especially during this pandemic, with a weighted mean of 3.90 with an interpretation of high. High school math courses would be very helpful no matter what I decide to study, with a weighted mean of 3.84 with an interpretation of high. A weighted mean of 3.49 with an interpretation of high for; Mathematics is dull, particularly for this new normal. At the same time, the indicator; that I plan to take as much mathematics as I can during my education has a weighted mean of 3.41 with an interpretation of high. The weighted mean for; I plan to take as much mathematics as I can during this pandemic is 3.24 and considered moderate. Also interpreted as moderate is; I am willing to take more than the required amount of mathematics regardless of modality, with a weighted mean of 3.22. Another interpreted as moderate is; I am happier in a math class than in any other class compared to distance learning, with a weighted mean of 3.18; It would not bother me at all to take more math courses even if it is a distance learning modality with a weighted mean of 3.08, and lastly, I can solve mathematics problems without too much difficulty educational websites, and others, with a weighted mean of 3.01.

3.5.2 Parent-Related Factors

Parents' support is an internal factor affecting the performance rating of students in Mathematics.

Table 6. Level of Parent-related Factors Affecting the Performance of the Respondents in Mathematics

S/N	Indicators	WM	Interpretation
1	My parents believe I put all my effort into tasks in connection with math, even if it is a distance learning modality.	3.80	High
2	My parents believe I can get better marks if I try harder in studying math subjects, although it is a distance learning modality.	3.91	High
3	My parent helps me with some difficult math problems.	3.08	Moderate
4	My parent expects me to be the best student in math and other subjects in my class, although face-to-face contact is limited.	3.15	Moderate
5	My parent tells me that a person must work hard to do something well, even if it is a pandemic.	4.03	High
6	My parent realizes the importance of mathematics in my future careers.	3.74	High
7	My parent thinks that math helps develop discipline and diligence, especially during a	3.68	High
8	My parent thinks that it is important to perform math computations quickly and accurately, especially during this pandemic.	3.54	High

9	My parent believes that developing mathematical talent increases future opportunities.	3.87	High
10	My parent realizes that math learned during this time of pandemic applies to real life.	3.80	High
Aggregate Mean		**3.66**	**High**

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

As shown in Table 6, the highest weighted mean is 4.03 and interpreted as high is; My parent tells me that a person must work hard to do something well, even during a pandemic. My parents believe I can get better marks if I try harder in studying math subjects, although it is a distance learning modality, with a weighted mean of 3.91 and interpreted as high. Next has a weighted mean of 3.87 and is interpreted as high is; My parent believes that developing mathematical talent increases future opportunities. While two indicators have a weighted mean of 3.80 and interpreted as high are, my parent realizes that math learned during this time of pandemic applies to real life. My parents believe I put all my effort into tasks in connection with math, even if it is a distance learning modality. While a weighted mean of 3.80 is interpreted as high, my parent thinks math helps develop discipline and diligence, especially during a pandemic. For the interpretation, my parent realizes the importance of mathematics in my future career, which has a weighted mean of 3.740 and is interpreted as high. My parent thinks math helps develop discipline and diligence, especially during a pandemic; it has a weighted mean of 3.68 and is interpreted as high. Whereas a weighted mean of 3.54 is interpreted as high, my parent thinks it is important to perform math computations quickly and accurately, especially during this pandemic. Although there are two that got an interpretation of moderate, my parent expects me to be the best student in math and other subjects in my class, although face-to-face contact is limited, has a weighted mean of 3.15. And my parent helps me with some difficult math problems, with a weighted mean of 3.08.

3.5.3 Home-Related Factors

These are the factors at home that would affect students' mathematics performance rating.

Table 7. Level of Parent-related Factors Affecting the Performance of the Respondents in Mathematics

S/N	Indicators	WM	Interpretation
1	Poor learning conditions at home make me feel bored, especially during math time.	3.76	High
2	Working mathematics at home makes me feel tense and comfortable.	3.28	Moderate
3	Having task related to math at home makes me feel good and better.	3.30	Moderate
4	Working with math subject at home make me feel nervous and uneasy.	3.65	High
5	I can get better results when I answer my math problems at home, particularly this time of the pandemic.	3.29	Moderate
6	I have less trouble working with other subjects and math at home.	3.32	Moderate
7	Working with mathematics at home is very frustrating, especially during this pandemic.	3.65	High
8	Math classes should be required at every level, particularly at home.	3.56	High

9	I can clearly understand math subjects when I am at home.	3.04	Moderate
10	Home is where I can develop my math skills easily.	2.98	Moderate
Aggregate Mean		**3.38**	**Moderate**

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

As disclosed in Table 7, the highest weighted mean is 3.76, with an interpretation of high as; Poor learning conditions at home make me feel bored, especially during math time. Followed by two indicators with a weighted mean of 3.65 with an interpretation of high is; Working with mathematics at home is very frustrating, especially during this pandemic, and working with math subjects at home makes me feel nervous and uneasy. A weighted mean of 3.56 with an interpretation of high is: Math classes should be required at every level, particularly at home. However, the indicator with a weighted mean of 3.32 with an interpretation of moderate is; I have less trouble working with other subjects and math at home. Another indicator that has an interpretation of moderate is; Having task related to math at home makes me feel good and better, with a weighted mean of 3.30. While a weighted mean of 3.29 and has an interpretation of moderate is; I can get a better result when I answer my math problems at home, particularly this time of the pandemic, and trailed by a weighted mean of 3.28 and considered as moderate is; Working mathematics at home makes me feel tense and comfortable. Though the succeeding indicators have the same interpretation of moderate, they differ with the weighted mean; I can clearly understand math subjects when I am at home, 3.04 weighted mean, and Home is where I can develop my math skills easily, has a weighted mean of 2.98.

3.5.4 Summary of the Level of the Perceived Factors Affecting the Performance of the Respondents

This part summarizes the level of the perceived factors affecting the mathematics performance of the respondents in the three identified schools in this study.

Table 8. Summary on the Level of the Perceived Factors Affecting the Performance of the Respondents

Components	WM	Interpretation
Student-related	3.43	High
Parent-related	3.66	High
Home-related	3.38	Moderate
Overall Aggregate Mean	**3.49**	**High**

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

With the presentation in Table 8, it was clear that the highest weighted mean of 3.66 with an interpretation of high is Parent-related, followed by Student-related with a weighted mean of 3.43 and an interpretation of high. Whereas Home-related factors have a weighted mean of 3.38 and considers moderate.

3.6 Level of Academic Performance of the Respondents in Mathematics

The following table presents the overall academic performance of the Grade 10 students in Tungkop National High School, Bankal National High School and Inabanga High School. Specifically, the second quarter grades of the respondents in mathematics were the researchers' basis for their academic performance. Table 9 presents the result.

Table 9. Level of Academic Performance of the Respondents in Math

Level	Numerical Range	f	%
Outstanding	90-100	140	44.30
Very Satisfactory	85-89	78	24.68
Satisfactory	80-84	65	20.57
Fair Satisfactory	75-79	33	10.44
Did not Meet the Expectations	Below 75	--	--
Total		**316**	**100.00**
Mean		87.33	
St. Dev.		5.55	

Table 9 discloses that 90-100 with a level of outstanding has a frequency of 140 or 44.30 percent, followed by 85-89 with a very satisfactory level of 78 or 24.68 percent. While a frequency of 65 or 20.57 percent for the satisfactory level and 75-79 for the fair satisfactory level has 33 or 10.44 percent.

3.7 Test of Significant Relationship

Table 10 presents the test of the relationship between the perceived factors affecting the respondents' performance in Math, such as, the student-related, parent-related, and home-related factors, at a 0.05 level of significance using Pearson r.

Table 10. Test of Relationship between the Perceived Factors and the Performance of the Respondents

Variables	r-value	StrengthofCorrelation	p-value	Decision	Result
Student-related and Performance	-0.014	Negligible Negative	0.807	Do not Reject Ho	Not Significant
Parent-related and Performance	-0.070	Negligible Negative	0.212	Do not Reject Ho	Not Significant
Home-related and Performance	-0.118*	Negligible Negative	0.036	Reject Ho	Significant

*significant at p<0.05 (two-tailed)

As shown in Table 10, the computed r-value of -0.014 for the student-related factors and the respondents' performance in Math illustrates a negligible negative correlation between these variables. At the same time, the p-value of 0.807, which is greater than the 0.05 level of significance, means that the null hypothesis is not rejected.

Moreover, the computed r-value of -0.070 for the parent-related factors and the respondents' Math performance means a negligible negative correlation between these two variables. At the same time, the p-value of 0.212, which is greater than the 0.05 level of significance, denotes that the null hypothesis is not rejected. These results suggest that there is no significant relationship between these variables.

Lastly, the computed r-value for the home-related factors and the respondents' performance in Math which is -0.118, means that there is a negligible negative correlation between these variables, and a p-value of 0.036 is lesser than the 0.05 level of significance, means that the null hypothesis is rejected. Thus, a significant relationship exists between home-related factors and the respondents' Math performance.

4. DISCUSSION

Based on the results of the data gathered, the profile of the respondents indicate that most of the respondents were 15-16 years old, female, majority of the mothers were high school graduate while the fathers were elementary level and with combined monthly family income of 10,000 and below. Wang et al.(2020)noted that female predicted higher mathematics anxiety. Also, smaller families lead to improved gifted students who score higher on originality (Alabbasi, 2020). Furthermore, parental expectations, children's attitudes, academic performance, and IQ scores in high school are all significantly related to birth order in ways that benefit the first child(Kim, 2020). In addition parental educational attainment was linked to their child's math competence (Silinskas&Kikas, 2019). On the other hand, family income is uniquely related to academic and social development in early childhood, middle childhood, and adolescence(Miller et al., 2021). According to Sosu et al.(2021), the relationship between socioeconomic status and academic outcome proves that educational inequalities are greater in higher-income families and countries. Families with a low-income Socioeconomic status negatively impact adolescent math achievement (Zhang et al., 2020). The monthly income of the entire family has an impact on the student's math performance. It cannot be denied that their income determines the financial support parents provide to their children.

On the levels of perceived factors affecting the performance in Mathematics, the parent-related has the highest aggregate mean of 3.66, followed by the student-related factors with a high aggregate mean of 3.43, and lastly the home-related factors with a moderate aggregate mean of 3.38. It showed that the indicator about parents' advice that a person must work hard to do something well even if it is pandemic has the highest weighted mean of 4.03 in the parent-related factor. The indicator with the highest weighted mean of 3.99 in the student-related factor is that studying mathematics makes students nervous, especially during this pandemic. Moreover, poor learning conditions at home make students feel bored, especially during math time is the indicator that resulted in the highest weighted mean of 3.76 in the home-related factor. Consequently, the overall aggregate mean of the three perceived factors that affect the mathematics performance of the learners has a numerical rating of 3.49 with an interpretation of high. This implied that relative to the learner's experience, the learners agreed about the perceived factors affecting their mathematics performance.

Students can learn how to use the online learning platform teachers use to teach mathematics. Allow children with diverse interests to experiment with math problems. Giving children the opportunity to express themselves in a peer-to-peer discussion. Construct and articulate knowledge through autonomous learning (Putri, 2021).Parental involvement in learning activities, as well as parental attitudes toward education, had a significant positive effect on children's mathematics achievement (Cui et al., 2021). Also, parental involvement seems to impact student achievement and wellbeing (Pinquart& Ebeling, 2020; Ribeiro et al., 2021).

Students' educational activities at home involve digital technology, which may negatively impact both low- and high-achieving students (Agasisti et al., 2020). According to Bringula et al. (2021)research, students encountered difficulties while learning online mathematics: they had difficulty submitting their mathematics assignments online.According to Moraño-Fernandez et al. (2021)students were able to adapt to changes in mathematics learning methods to fully online (e-learning) during the Covid-19 pandemic. Home education has proven to be challenging for both students and parents. Parents are worried about their children's social isolation, lack of interaction, and increased screen time (Misirli&Ergulec, 2021).

As for the level of academic performance of the respondents in the mathematics subject, the result showed a mean grade of 87.33 with an interpretation of Very Satisfactory. The implication is that the learners are performing in their mathematics subject despite the new setup in education brought by the COVID-19 pandemic. When learning mathematics online, students could overcome obstacles, which resulted in good performance in their math classes(Hwang et al., 2021).

For the perceived factors affecting the Mathematics performance of the respondents, the results implied no significant relationship between the student-related factors and the learners' Math performance. Similarly, there is no significant relationship between the parent-related factors and

the learners' Math performance. However, the study determined a significant relationship between home-related factors and the learners' Math performance. The results imply that there is no significant relationship between the student-related factors and the respondents' Math performance. The modular and online learning environment shows that low-achieving students improved more than high-achieving students, implying that the performance gap between low- and high-achieving students is narrowing (Peng et al., 2022).

Moreover, the computed r-value of -0.070 for the parent-related factors and the respondents' Math performance means a negligible negative correlation between these two variables. At the same time, the p-value of 0.212, which is greater than the 0.05 level of significance, denotes that the null hypothesis is not rejected. These results suggest that there is no significant relationship between these variables. Parents supporting their children's learning during the Covid-19 pandemic is vital for motivating the learners in doing their academic tasks (Panaoura, 2021).

Lastly, the computed r-value for the home-related factors and the respondents' performance in Math which is -0.118, means that there is a negligible negative correlation between these variables, and a p-value of 0.036 is lesser than the 0.05 level of significance, means that the null hypothesis is rejected. Thus, a significant relationship exists between home-related factors and the respondents' Math performance. Students keep up with readings, be coordinated, listen and read carefully, put together work and make lessons meaningful and relevant, participate in online conversations and interact with other students, and perform well on tests and assessments (Tay et al., 2021).

5. CONCLUSION

Based on the findings of the study, the COVID-19 pandemic has caused various challenges to students due to the implementation of modular distance learning. The study concluded that home-related factors had moderately affected the performance of the learners. As a result, school administrators must quickly design responses with specific contexts in mind as the pandemic progresses.

Theresearchers strongly recommend that the proposed enhancement plan be implemented because it will help grade 10 students' mathematical achievement in the midst of the COVID-19 pandemic and will give supplemental instructions to all parents to help learners with home-related aspects affecting respondents' mathematics performance, with a focus on learners' needs and gaps in this new normal of education.The use of learning modules assists in meeting the emerging educational needs in response to this pandemic. The blended learning approach proposed by DepEd would be implemented through online, television, radio, and printed materials. This approach has influenced the home-related factors and impacted the learners' mathematics performance.

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