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Pandemic-Related Anxiety in Math Learning among Selected Public Senior High School Students in the Island Municipalities of Northern Samar

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Abstract

Students in math really struggle during the COVID-19 pandemic. The situation posed a significant challenge for normal schooling for millions of students in the Philippines, thus created anxiety in learning. This descriptive-correlational study explored the pandemic-related anxiety in math learning among selected public senior high school students in the island municipalities of Northern Samar; documented the factors that affects the anxiety in terms of students' profile, parents' profile and teachers' profile; and find out if there is a significant relationship between the students' profile, parents' profile and teachers' profile of the respondents and the pandemic-related anxiety in math learning. The study utilized both descriptive and inferential statistics through proportional random sampling. The findings revealed that most of the students had one available learning device at home; moderately ready for modular distance learning; had internet access; and had a very satisfactory performance in mathematics. In terms of parents' profile, most of the fathers and mothers had completed high school level, had a monthly income of less than Php 10,957, and spent 1-3 hours per week in assisting their children. With regard to teachers' profile, the majority of the teachers were not trained in modular distance learning. However, the teachers had very good math teaching practices. Findings also revealed that the students had a moderate level of pandemic-related anxiety in mathematics learning. Teachers' practices in teaching math were significantly associated to the pandemic-related anxiety in math learning. There was significant relationship between the students' readiness for modular distance learning and school-related, environment-related, and technology-related anxieties of the students. There was significant relationship

between the father's educational attainment and the school-related and personal anxieties of the students. A significant relationship was also found between the number of hours spent by the parents per day for assisting their children in answering their modules and the environment-related anxiety of the students. Furthermore, the number of trainings attended related to modular distance learning and the technology-related anxiety were positively correlated.

Keywords: pandemic-related anxieties; math learning; profile; senior high school students.

Introduction

The coronavirus disease (COVID-19) has brought a huge crisis across the globe, particularly in the education system, and has completely changed the lives and perspectives of many teachers and students. The new normal learning modalities have embodied a lot of shocks for students and parents alike. The students had experienced abrupt isolation, anxiety attacks, and the uncertainty of learning continuity about the future. On the other hand, it impacts parents' productivity because of loss of family income, unavailability of time, and their readiness for instructional support to learning.

Furthermore, the sudden shift in the modality of learning from a physical classroom to online or modular has created disruption among students. As a result, it posed a significant challenge for normal schooling for millions of students in the Philippines. Students in math really struggle during the COVID-19 pandemic. Some students had difficulty concentrating on math learning and manifested symptoms of anxiety specifically in math learning during the COVID-19 pandemic. Their social and emotional needs were greatly affected by the tremendous severance in the educational system. The long-term isolation at home and the suspension of classes due to the implementation of protocols made the adverse impact of the pandemic even more serious [1].

The study of Bringula et al. [2] identified such mathematics-related problems from the situation where there was an abrupt change in pedagogical style in the learning set-up. The study intends to explore mathematics self-concept and how pandemic issues like readiness of the school, the students, the teachers, parents, and other academic stakeholders lead to academic anxiety, particularly in mathematics.

The Department of Education has been implementing the new normal form of education in which modular distance learning has emerged as the most preferred learning mode. According to the survey conducted by the Department of Education (DepEd) [3] through the use of Local Enrolment Survey Forms (LESFs), the key difficulties and obstacles that

the students had faced were self-studying, lack of sleep, gadget availability, poor internet connection, and time to address all the modules. Similarly, these challenges have surfaced among the schools in the province of Northern Samar in adapting to the new normal education. Learners were struggling with technological limitations and innovative learning. Learners also had a hard time coping with modular instruction due to a lack of instructional support from parents, thus, creating a large gap in their learning.

The main objective of this study was to determine the pandemic-related anxiety in math learning among selected public senior high school students in the island municipalities of Northern Samar. Specifically, it aimed to document the students' profile in terms of number of available learning devices at home, readiness to modular distance learning, mathematics performance, and internet access; document the profile of the respondents' parents in terms of educational attainment, parents' monthly income, and number of hours spent per week for assisting their children in answering their modules; document the teachers' profile of the respondents in terms of number of trainings attended related to modular distance learning, and teacher's practices in teaching math. It tried to determine if there is a significant relationship between the students' profile, parents' profile and teachers' profile of the respondents and the pandemic-related anxiety in math learning.

Methodology

The descriptive-correlational study was conducted among 350 senior high school students from the island municipalities of Northern Samar selected through Slovin's formula and proportional sampling. The students were fully informed about the purpose of the study and were given consent form before the distribution of the questionnaire. The research instrument consisted of two (2) parts. Part I documented the respondents' profile which includes available learning devices at home, readiness to modular distance learning, the mathematics performance of the first semester, and internet access; the parents' profile of the respondents which consists of educational attainment, parents' monthly income and number of hours per week for assisting their children in answering their modules; and the teachers' profile of the respondents in terms of relevant trainings attended related to modular distance learning and teacher's practices in teaching math. Part II determined the pandemic-related anxiety of the respondents in math learning that was embodied with the instrument taken from the study of Barcenas & Bibon [4].

The list of available learning devices at home was patterned from DepEd Order No. 008, s. 2020 [5].The researcher considered the actual data of the number of devices in analyzing the data. The following scale was used in interpreting the means for the perception of the level of readiness of the respondents in distance learning: 3.25-4.00 (Highly

Ready); 2.50-3.24 (Moderately Ready); 1.75-2.49(Less Ready); and 1.00-1.74 (Least Ready). The categorization and interpretation of the mathematics performance of the respondents was patterned from DepEd Order No. 8, s. 2015 [6]: 90-100 (Outstanding); 85-89 (Very Satisfactory); 80-84 (Satisfactory); 75-79 (Fairly Satisfactory); and Below 75 (Did not Meet Expectations). Teacher's practices in teaching math were computed and categorized as 4.20-5.00 (Excellent Practice); 3.40-4.19 (Very Good Practice); 2.60-3.39 (Good Practice); 1.80-2.59 (Fair Practice); and 1.00-1.79 (Poor Practice). To determine the pandemic-related anxiety in math learning, the following scale were used: 4.20-5.00 (Very high anxiety); 3.40-4.19 (High anxiety); 2.60-3.39 (Moderate anxiety); 1.80-2.59 (Low anxiety); and 1.0-1.79 (Very low anxiety).

Frequency counts and percentages were used to document the profile of the respondents, their parents' profile, as well as their teachers' profile. However, a weighted mean was utilized to determine the pandemic-related anxiety in terms of school-related factor, personal factor, environmental-related factor, and technology-related factor. Moreover, Pearson Product Moment Coefficient of Correlation was used to test the relationships between the students' profile, parents' profile, and teachers' profile and the pandemic-related anxiety in math learning among high school students.

Results and Discussion

Profile of the Respondents

Number of Available Learning Devices at Home

Table 1.1a shows the profile of the respondents in terms of the number of available learning devices at home. As can be observed in the table below, three (3) or 0.9% had seven
that they had three available learning devices at home. Unfortunately, 63 or 18% had two available learning devices at home; 179 or 51.1% had only one available learning device at home; and 27 students or 7.7% admitted to have no available device at home.

The abovementioned findings revealed that most of the student-respondents had only one available learning device at home. This is an indication that there is an insufficient availability of learning devices among the student-respondents. It can be inferred that students have difficulties in catching with their lesson especially those that use electronic devices. It also entails poor implementation of either online or blended learning and imposes the printed modular learning approach among the students who do not have access to learning devices. This finding confirms the report of the Department of Education (DepEd) that one of the key difficulties faced by students amidst the pandemic is the unavailability of gadgets.

Table 1.1a. Number of Available Learning Devices at Home

Number of Available Learning Devices at Home	F	%
7	3	0.9
6	7	2
5	16	4.6
4	19	5.4
3	36	10.3
2	63	18
1	179	51.1
0	27	7.7
Total	**350**	**100**

In order to provide clear evidence of their existence, as shown in Table 1.1a, the table below enumerates the specific learning devices that are available at home. It could be observed in Table 1.1b that 179 student-respondents confessed to having an available smartphone at home; 112 students admitted to having non-cable television; 62 student-respondents claimed to have a desktop computer; 55 students had tablet computers; 48 had laptop computers; and 45 respondents proclaimed having a radio at home. However, the table shows that there were only 38 students who stated that they had cable television and 36 students disclosed that they had an available basic cellphone at home.

The abovementioned findings show that most of them claimed that they have a smartphone at home. This is an indication that smartphones are the most essential gadget needed by the respondents during the pandemic in their teaching and learning process.

This finding confirms the study of Cleofas and Rocha [7], which revealed that the majority of the students do not own laptops and desktop computers.

Table 1.1b. Available Learning Devices at Home

Learning Devices	F	Rank
Smartphone	179	1
Non-cable television	112	2
Desktop computer	62	3
Tablet computer	55	4
Laptop computer	48	5
Radio	45	6
Cable television	38	7
Basic cellphone	36	8

Readiness to Modular Distance Learning

Table 1.2 shows the level of readiness of the students to modular distance learning. As could be observed in the table, some specific indicators were rated as "moderately ready" such as: (1) The student is prepared for the distance learning, with a mean of 3.07; (2) Learning at the comfort of student's home made him enthusiastic in learning (M=2.84); (3) The student feels that the knowledge in the computer helped him in the distance learning (M=2.81); (4) Using the student's gadgets or computer in learning made him feel excited in the distance learning (M=2.77); and (5) The student feels happy learning at home alone without having collaboration with his classmates (M=2.63).

On the contrary, two indicators were rated as "less ready" namely: (1) The student is comfortable in listening to lectures of teachers using recorded videos at home while lying at bed and doing household chores (M=2.47); and (2) The student is not used to online learning (M=2.29).

A grand mean of 2.70 shows that the students are moderately ready for modular distance learning. This is an indication that the students are not very much prepared posed by COVID-19 in the field of basic education. It can be inferred that students are experiencing difficulties in complying their modules especially that this type of learning modality is new to everyone.

According to Barcenas & Bibon, the students are practical enough in finding ways to solve learning issues during a pandemic. Nonetheless, despite the methods for dealing with modular distance learning problems, some students are unable to resolve academic issues. As a result, they tend to become helpless and opt not to complete the difficult activities or the entire activity itself.

Table 1.2. Readiness to Modular Distance Learning

Readiness to Modular Distance Learning	Mean	Interpretation
1. The student is prepared for the distance learning.	3.07	Moderately Ready
2. Learning at the comfort of student's home made him enthusiastic in learning.	2.84	Moderately Ready
3. The student feels that the knowledge in the computer helped him in the distance learning.	2.81	Moderately Ready
4. Using student's gadgets or computer in learning made him feel excited in the distance learning.	2.77	Moderately Ready
5. The student feels happy learning at home alone without having collaboration with his classmates.	2.63	Moderately Ready
6. The student is comfortable in listening to lectures of teachers using recorded videos at home while lying at bed and doing household chores.	2.47	Less Ready
7. The student is not used to online learning.	2.29	Less Ready
Grand Mean	**2.70**	**Moderately Ready**

Mathematics Performance

Table 1.3 revealed that 136 or 38.9% had an outstanding performance in Mathematics in the 1st semester having a grade of 90-100; 149 or 42.6% received a grade of 85–89; and 54 or 15.4% got a grade of 80-84. However, 11 students or 3.1% had a fair performance in Mathematics during the 1st semester of S.Y. 2021-2022 with a rating score of 75-79.

This statistical data shows that the number of the respondents who had a very satisfactory performance is a bit higher than the number of students who had an outstanding performance in mathematics. It only shows that the number of high school students who had a higher level of proficiency is slightly greater than the learners who had the highest academic standing in mathematics. This is also an indication that students' mathematics performance is not seriously affected or disrupted by the sudden shift of modality of learning. It can be inferred that students are learning mathematics despite the challenges brought by the pandemic.

However, the study of Barrot et al. [8], revealed that the COVID-19 pandemic had the greatest impact on the quality of the learning experience of Filipino students. For the anxiety and mental health issues, most students reported that the anxiety, boredom, sadness, and isolation they experienced had adversely impacted the way they learn. Vargas-Ramos et al. also cited that many international studies have concluded that the non-face-to-face modality has negatively affected the academic performance of students. For instance, the fall assessments of the Northwest Evaluation Association (NWEA) showed that elementary and middle school students have fallen measurably behind in math.

Table 1.3. Mathematics Performance of the Student-Respondents

Mathematics Performance	F	%	Description
90 – 100	136	38.9	Outstanding
85 – 89	149	42.6	Very Satisfactory
80 – 84	54	15.4	Satisfactory
75 – 79	11	3.1	Fairly Satisfactory
Total	**350**	**100**	

Internet Access

Table 1.4 revealed that there were three hundred twenty-six (326) or 93.1% had internet access, while only 24 or 6.9% had no source of internet connection.

The majority of the respondents disclosed that they were using mobile or prepaid data to have an internet access, while very few of them admitted to having other sources of internet connection, such as

broadband internet. This is an indication that the students have internet access that could be used in their school-related activities. It can be inferred that students have easy means of doing activities with the use of the internet.

This study confirmed Chung et al.'s [9] finding that most students use mobile data to connect to the internet. According to Siddiquah and Salim [10], problems with the internet signal might become a barrier among students in their learning. The result of Asio et al. [11], that the majority of the students had internet access at home was also confirmed in this part of the study.

Table 1.4. Internet Access

Access to Internet Connection	F	%
With internet access	326	93.1
Without internet access	24	6.9
Total	**350**	**100**

Profile of the Parents

Father's Educational Attainment

As clearly transcribed in Table 2.1, there were 46 fathers or 13.1% who completed their baccalaureate degree courses while 29 or 8.3% were college undergraduates; and 88 or 25.1% are high school graduates while 64 or 18.3% were undergraduates. Unfortunately, it is sad to note that there were still some fathers who did not even finish elementary education level and some who were elementary graduates, with a percentage rate of 18% and 13.4%, respectively.

Aiming for higher education is also apparent among the male-parents of the respondents, as recorded in Table 2.1. Eight (8) or 2.3% were taking up master's degree programs; one (1) father or 0.3% already earned his master's degree program; and four (4) or 1.1% earned their doctorate programs.

From the abovementioned statistics, it shows the number of fathers who completed college was a bit lower than those who had completed high school. This is an indication that the fraternal knowledge support gained by the students is lower considering the high school qualification of their fathers. It can be inferred that the fathers have limitations on giving technical assistance to their children.

On the contrary, the PSA 2015 Census of Population reported that there were more males who had reached or finished college than those whose highest educational attainment was high school only.

Table 2.1. Father's Educational Attainment

Educational Attainment	F	%
Doctoral Degree Graduate	4	1.1
MA/MS Degree Graduate	1	0.3
College Graduate with MA/MS Units	8	2.3
College Graduate	46	13.1
College Undergraduate	29	8.3
High School Graduate	88	25.1
High School Undergraduate	64	18.3
Elementary Graduate	47	13.4
Elementary Undergraduate	63	18
Total	**350**	**100**

Mother's Educational Attainment

Table 2.2 presents the educational attainment of the mothers. At the elementary level, 39, or 11.1%, of female parents were elementary graduates, while 43 or 12.3% were elementary undergraduates. At the secondary level, 108 or 30.9% were high school graduates, while 61 or 17.4% were undergraduates. At the tertiary education level, 50 or 14.3% were college graduates, while 26 or 7.4% were college undergraduates.

Table 2.2 also revealed that some mothers were also graduates of their master's and doctorate degree programs, while only a very small number are in the process of obtaining them. Eighteen (18) or 5.1% were college graduates with master's degree units; two (2) or 0.6% were MA/MS graduates; two (2) or 0.6% were MA/MS graduates with doctoral units; and only one (1) mother had already completed her doctoral degree program.

The above data shows that the number of high school graduates among mothers is slightly higher than that of college graduates. As far as education is concerned, it indicates that the knowledge support of female parents to their schoolchildren is lower considering the mothers' educational attainment. It infers that their mothers have also limitations in assisting their children with technical issues.

The report of the Philippine Statistics Authority (PSA Northern Samar, 2015) that there were more females who completed secondary education level than college level was confirmed in this part of the study. The same pattern was observed in the survey by the 2020 Global Gender Gap Report of the World Economic Forum (WEF) that there were more Filipino women enrolled in secondary education (71.3%) than in college (40.4%).

Table 2.2. Mother's Educational Attainment

Educational Attainment	F	%
Doctoral Degree Graduate	1	0.3
MA/MS Graduate with Doctoral units	2	0.6
MA/MS Degree Graduate	2	0.6
College Graduate with MA/MS units	18	5.1
College Graduate	50	14.3
College Undergraduate	26	7.4
High School Graduate	108	30.9
High School Undergraduate	61	17.4
Elementary Graduate	39	11.1
Elementary Undergraduate	43	12.3
Total	**350**	**100**

Parents' Monthly Income

Table 2.3 shows the monthly income of the parents of the student-respondents. As shown in the table below, seven (7) or 2.1% belonged to the middle class with a monthly income of Php 43,829–76,699; 26 or 7.7% belonged to the lower middle class with a monthly income of Php 21,915–43,828; 33 parents or 9.6% had a monthly income of Php 10,958–21,914; and 284 or 81.3% had a monthly income of less than Php 10,957. Based on the gathered data, the highest and lowest monthly incomes earned by the parents were Php 55, 000 and Php 500, respectively.

Based on the abovementioned data, it could be inferred that the majority of the parents are receiving below marginal salaries. It means that the majority of the families in the province of Northern Samar belonged to poor families. This connotes that the majority of parents could hardly provide for their children's education needs.

The latest survey of the Social Weather Stations (as posted online by Inquire.Net in 2021), reported that almost half of the Filipino families rate themselves as poor, which was confirmed in this part of the study. The report of the Philippine Statistics Authority (PSA, 2021) showed that the proportion of poor Filipinos whose per capita income is not sufficient to meet their basic needs was estimated at 23.7 percent.

In their study, Eyles et al. [12], mentioned that students from disadvantaged families had low scholastic performance due to a lack of resources, a lack of home spaces for online learning, and the incapability of the parents to support their children's online learning.

Table 2.3. Parents' Monthly Income

Monthly Income	F	%	Description
Php 43,829 - Php 76,699	7	2.1	Middle Class
Php 21,915 - Php 43,828	26	7.7	Lower Middle Income
Php 10,958 – Php 21,914	33	9.6	Low Income (but not Poor)
Less than Php 10,957	284	81.3	Poor
Total	**350**	**100**	

Number of Hours Spent Per Week for Assisting their Children in Answering their Modules

Table 2.4 shows that 193 students or 55.1% admitted that that their parents spent 1-3 hours per week for assisting them in answering their modules; 113 or 32.3% confessed that their parents provided 4-6 hour-assistance in answering their modules; and 43 or 12.3% disclosed that their parents assisted their children for 7-9 hours. However, it is sad to note that there was one parent who had no time for assisting his child in answering his/her modules.

This shows that most of the parents spent 1-3 hours per week assisting their children in answering their modules. This means that the parents devoted less time their children's schooling during pandemic. This suggests that parents need to be more supportive of the school undertakings of their children. It can be inferred that students' education is given less importance by parents during the COVID-19 pandemic.

According to Goodall [13], some parents feel more connected to their child's schoolwork, while others see this as an additional burden. Challenges that may impact parental involvement include economic resources; lack of internet access; lack of interest in using technology; and having low digital self-efficacy.

Table 2.4. Number of Hours Spent Per Week for Assisting their Children in Answering their Modules

Number of Hours Spent Per Week	F	%
7-9 hours	43	12.3
4-6 hours	113	32.3
1-3 hours	193	55.1
No time	1	0.3
Total	**350**	**100**

Profile of the Teachers

Number of Trainings Attended Related to Modular Distance Learning

As stated in Table 3.1, only three (3) teachers or 0.9% were able to attend more than three (3) trainings relevant to modular distance learning; 30 or 8.5% had attended 3-4 trainings; and 62 or 17.7% had attended 1-2 trainings. However, it is disappointing to note that 255 or 72.9% had not experienced any training related to modular distance learning.

The abovementioned figures show the majority of the teachers were not trained in modular distance learning. This goes to show that the Division of Northern Samar inadequately provides training that could possibly capacitate the teachers in managing the teaching-learning process in the midst of a pandemic through a modular learning approach. It suggests that teachers need adequate training to cope with the challenges of the pandemic.

Pellegrini et al. [14], posited that technology brings numerous advantages to academic employees, particularly in the familiarity of digital technology and computer-based work and teaching.

Table 3.1.Number of Trainings Attended Related to Modular Distance Learning

Number of Trainings	F	%	Description
more than 4	3	0.9	Highly Trained
3-4	30	8.5	Moderately Trained
1-2	62	17.7	Poorly Trained
0	255	72.9	Not Trained
Total	**350**	**100**	

Teacher's Practices in Teaching Math

Table 3.2 represents the teacher's practices in teaching math. As could be observed in the table, the top five teaching practices that were rated by the students as "very good" are the following: The math teacher fairly gives students the grades they deserve (M=4.14); the math teacher values all students equally and considers responses in different forms (M=4.07); the math teacher encourages his/her students to solve problems (M=3.94); the math teacher gives ample time to answer and submit learning activity sheets considering the poor internet accessibility of students (M=3.92); and the math teacher helps students whenever he/she fails to do their assignments, tasks and other module-related works (M=3.81).

On the contrary, calling all students by names through personal Facebook accounts for math activity linkages and digital instructions for learning purposes was considered good teaching practice.

A grand mean of 3.77 shows that the teachers had very good math teaching practices as assessed by the student-respondents. This is an indication that mathematics teachers are effective teachers. It suggests that the teaching methods of teachers affect students' performance.

According to Leinwand et al., effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.

Table 3.2. Teacher's Practices in Teaching Math

Statements	Mean	Interpretation
1. The math teacher fairly gives students the grades they deserve.	4.14	Very good
2. The math teacher values all students equally and considers responses in different forms (printed or digital).	4.07	Very good
3. The math teacher encourages his/her students to solve problems.	3.94	Very good
4. The math teacher gives ample time to answer and submit learning activity sheets considering the poor internet accessibility of students.	3.92	Very good
5. The math teacher helps students whenever he/she fails to do their assignment/s, tasks and other module-related works.	3.81	Very good
6. The students find their math teacher's attitude and behavior democratic in giving instructional support in learning modules.	3.77	Very good
7. The math teacher allows everyone to express ideas and techniques in presenting answers in mathematics remotely using messenger or the said Facebook group.	3.69	Very good
8. The Math teacher does not force anyone to submit their outputs when students could not finish working his/her tasks ahead of the schedule.	3.69	Very good
9. The students can freely tell their math teacher if they don't understand the subject by communicating using email or messenger.	3.45	Very good
10. The math teacher calls all students by names through personal Facebook accounts for math activity linkages and digital instructions for learning purposes.	3.25	Good
Grand Mean	**3.77**	**Very Good**

Pandemic-Related Anxiety in Mathematics Learning among High School Students

Table 4 shows the pandemic-related anxiety in mathematics learning among high school students in terms of school- related factors, personal factors, environmental-related factors, and technology-related factors.

School-Related Factors

Table 4.1 shows that the students mostly experienced moderate level of anxiety. The following school-related factors contribute to a moderate level of anxiety among the respondents: (a) too many math learning activities; (b) a wide range of concepts and fields of study had a significant impact and difficulty on students' understanding of mathematical concepts; (c) inadequate materials for the math teacher to present instructional aid in learning; (d) working modules with errors of construction, misprints, and the like impede the student's independent learning; (e) failure to study or lack of time to complete mathematics modules due to domestic responsibilities and procrastination of schoolwork; (f) incomprehensible and incomplete formulas irritate and/or prevent students from comprehending the topic/lesson; and (g) blurry (unclear) pictures and unorganized and not in the correct page sequence.

The weighted mean of 3.30 indicates that the level of pandemic-related anxiety in mathematics learning among high school students is moderate. This means that the students' moderate level of math anxiety during the pandemic is due to school-related factors.

According to Nuere et al. [15], the students' performance is affected by the learning facilities, insufficient technical know-how, and the conduct of online teaching.

Table 4.1. Pandemic-Related Anxiety in Mathematics Learning among High School Students in terms of School-Related Factor

School-Related Factor	Mean	Interpretation
1. Difficulty in compliance of the submission and retrieval of modules in school affects the student's overall organization of the time schedules.	3.41	High Anxiety
2. Too many learning activities in Mathematics give the student stress and academic burnouts.	3.39	Moderate Anxiety
3. A wide variety of concepts/topics and field of study create a great field of impact and difficulty towards the student's understanding of the Mathematical concepts during the COVID-19 pandemic.	3.39	Moderate Anxiety
4. Inadequate materials of the math teacher to present instructional aid (teacher-recorded video tutorial, downloaded online learning modules) in learning.	3.35	Moderate Anxiety

School-Related Factor	Mean	Interpretation
5. Working modules with errors of constructions, misprints and the like impede the student's independent learning.	3.33	Moderate Anxiety
6. Failure to study or lack of time in doing Mathematics modules due to responsibilities at home and procrastination of school works.	3.26	Moderate Anxiety
7. Incomprehensible and incomplete formulas bother and/or prevent the student from understanding the topic/lesson.	3.21	Moderate Anxiety
8. The teacher makes Math modules with pictures that are blurry (unclear), unorganized, and not in correct page sequence.	3.05	Moderate Anxiety
Weighted Mean	**3.30**	**Moderate Anxiety**

Personal Factors

As recorded in Table 4.2, students experienced a high level of anxiety in mathematics in terms of personal factors. The factors that caused a high level of anxiety among the students were the following: Grade consciousness that affects the student's overall performance by making him/her overthink of the possible scenarios that might have a horrible impact on his/her future (M=3.53); laziness that affects the student's overall participation and performance during modular classes (M=3.47); poor comprehension of some unfamiliar words and mathematically irrelevant terms being used (M=3.44); working alone without instructional support from the teacher that impedes the student's independent learning (M=3.42); and lessons that are hard to understand, especially when it comes to mathematics, because they were not explained by the teacher (M=3.41).

The weighted mean of 3.44 shows that the level of pandemic-related anxiety in mathematics learning among high school students is high. This indicates that the high level of math anxiety of the respondents during the pandemic is attributed to personal factors. This means that students' math performance is hampered by a strong sense of tension and anxiety due to various personal aspects such as grade consciousness, laziness, poor comprehension, and lack of instructional support from the teacher.

Save the Children reported that the effects of COVID-19 pandemic on education provision, learning, and well-being are severe for most school children all over the world. Cornine [16] also mentioned that those students with high math anxiety levels are related to the effect of the pandemic. According to Dr. Szucs [17], math anxiety is a debilitating emotional reaction to mathematics. It is a feeling of tension and it interferes with the manipulation of numbers and the solving of mathematical problems in ordinary life and academic situations.

Table 4.2. Pandemic-Related Anxiety in Mathematics Learning among High School Students in terms of Personal Factor

Personal Factor	Mean	Interpretation
1. Grade consciousness affects the student's overall performance by making him/her overthink of the possible scenarios that might make a horrible impact on his/her future.	3.53	High Anxiety
2. Feeling lazy affects the student's overall participation and performance during modular classes.	3.47	High Anxiety
3. The student is poor in comprehension of some unfamiliar words and mathematically irrelevant terms being used.	3.44	High Anxiety
4. Working alone without instructional support from the teacher impedes the student's independent learning.	3.42	High Anxiety
5. The student can hardly understand lessons especially when it comes to mathematics because they were not explained by our teacher.	3.41	High Anxiety
6. Loneliness and isolation affect the student performance especially during the pandemic and causes anxiety attacks.	3.35	Moderate Anxiety
Weighted Mean	**3.44**	**High Anxiety**

Environment-Related Factors

Table 4.3 shows the pandemic-related anxiety in mathematics learning among high school students in terms of environment-related factor. The five specific environmental factors that contribute to a moderate level of anxiety among the students were the following: Home-related responsibilities such as doing household chores and taking care of siblings that affect the student's time management in doing schoolwork distantly; responsibility for teaching the student's younger sibling/s on answering their modules that induces stress too; the family lacks educational background to assist the student in working the modules; no support system is available to attend to the student's academic needs; and no family member can provide the student with instructional aid in learning math modules.

On the contrary, some indicators caused high level of anxiety among students, such as: frequent usage of social media that affects the focus and attentiveness of students on modular learning; and unwanted background noises that distract the student from answering his/her modules and make him/her lose track of them.

The weighted mean of 3.29 shows that the level of pandemic-related anxiety in mathematics learning among high school students in terms of environment-related anxiety is moderate. This indicates that the moderate level of math anxiety of the student-respondents amidst the pandemic is attributed to environmental-related factors.

The abovementioned findings confirm the result of Baticulon et al. [18] that the shift from classroom learning to home-based learning environment raises some concerns for students such as noise and other distractions. The result of Jiang's study was also confirmed in which the anxiety is attributed to problematic social media usage of the students during COVID-19. According to Andreassen et al. [19], given that preoccupation and the excessive amount of time spent on social media are symptoms of problematic use, excessive social media use among students may easily turn into problematic use. As cited by Elhai, et al. [20], overuse and problematic social media usage have been linked to poor psychological well-being, and symptoms of depression and anxiety.

Barcenas et al. mentioned that many students displayed anxiety during the entire period of lockdown due to the lack of support system, such as no family members present to give instructional aid in learning; the family lacks educational background to assist them; and parents were busy working.

Table 4.3. Pandemic-Related Anxiety in Mathematics Learning among High School Students in terms of Environmental-Related Factor

Environment-Related Factor	Mean	Interpretation
1. Frequent usage of social media affects the focus and attentiveness of student on modular learning.	3.54	High Anxiety
2. Unwanted background noises distract the student from answering his/her modules and make him/her lose track of them.	3.51	High Anxiety
3. Responsibilities at home like doing household chores and taking care of siblings affect the student's time management in doing school works distantly.	3.39	Moderate Anxiety
4. Responsibility for teaching the student's younger sibling/s on answering their modules induces stress too.	3.37	Moderate Anxiety
5. The family lacks educational background to assist the student in working the modules.	3.18	Moderate Anxiety
6. No support system is available to attend the student's academic needs.	3.06	Moderate Anxiety
7. No family members can provide the student with instructional aid in learning math modules.	2.98	Moderate Anxiety
Weighted Mean	**3.29**	**Moderate Anxiety**

Technology-Related Factors

Table 4.4 shows that there are three (3) technology-related factors that caused a high level of anxiety among the students. These include: online classes and digital modular learning (M=3.73); graphical representations

in mathematics (M=3.73); the instability of internet connection (M=3.40).

On the other hand, there were also three (3) contributing factors to a moderate level of anxiety, such as: unavailability of personal computers and/or smartphones for modular learning in mathematics (M=3.39); lack of finances or budget for an online class and submissions of the requirements/tasks (M=3.26); and technological recreations like playing mobile legends that consumes much of the student's time management in modular distance learning (M=3.10).

The weighted mean of 3.44 indicates that high school students have a high level of pandemic-related anxiety in mathematics learning. This suggests that the students' math anxiety during the pandemic was caused by technological reasons. This infers that math performance of students is affected by a significant sensation of stress, fear, and anxiety brought by some technological issues such as online instruction and poor internet connection.

Nuere and de Miguel asserted that once technology has been repeatedly misused and overused, it can cause a disabling condition on students' struggles in mathematics that leads to math anxiety among them.

Table 4.4. Pandemic-Related Anxiety in Mathematics Learning among High School Students in terms of Technology-Related Factor

Technology-Related Factor	Mean	Interpretation
1. Online class and digital modular learning are challenging to do and costly.	3.73	High Anxiety
2. It's hard to do graphical representations in Mathematics exercises which require online instructions.	3.73	High Anxiety
3. The student does not have stable internet connection in the area.	3.40	High Anxiety
4. The student does not have personal computers and/or smartphones for modular learning in mathematics.	3.39	Moderate Anxiety
5. The student does not have finances or budget for an online class and submissions of requirements/tasks.	3.26	Moderate Anxiety
6. Technological recreation like playing mobile legend consumes much of student's time management in modular distance learning.	3.10	Moderate Anxiety
Weighted Mean	**3.44**	**High Anxiety**

As could be observed in Table 4.5, the pandemic-related anxiety in terms of personal and technology-related factors were highly felt by the learners. On the other hand, the pandemic-related anxiety in terms of environmental-related factor was least felt by the student-respondents.

In general, the grand mean of 3.37 shows that there is a moderate level of pandemic-related anxiety in mathematics learning among high school students. This means that the students moderately experienced stressful, dangerous, or unfamiliar situations, affecting their mathematical thinking and problem-solving processes.

Similarly, the study of Li et al. [21], revealed that high school students were more likely to experience stress, anxiety, and depression than others during the pandemic. However, it contradicts the findings of Mabanta [22] that the students had moderately low level of math anxiety.

Table 4.5. Summary of the Pandemic-Related Anxiety in Mathematics Learning among High School Students

Factors Contributing Math Anxiety	Weighted Mean	Interpretation
A. School-Related Factor	3.30	Moderate Anxiety
B. Personal Factor	3.44	High Anxiety
C. Environment-Related Factor	3.29	Moderate Anxiety
D. Technology-Related Factor	3.44	High Anxiety
Grand Mean	**3.37**	**Moderate Anxiety**

Test of Relationship between the Students' Profile, Parents' Profile and Teachers' Profile and the Pandemic-Related Anxiety in Math Learning Among High School Students

Pearson Product Moment Coefficient of Correlation at a 0.05 level of significance was used to test the relationship between the students' profile, parents' profile and teachers' profile and the pandemic-related anxiety in math learning among high school students.

Table 5.1 shows the relationship between the students' profile and the pandemic-related anxiety in math learning. The result of the analysis showed that the number of available learning devices at home had no significant relationship with the school-related anxiety (r=.093, p=.084), personal-related anxiety (r=.000, p=.993), environment-related anxiety (r=-.070, p=.192), and technology-related anxiety (r=-.088, p=.099).

However, it was found that the students' willingness to learn using modular approach is positively and significantly correlated to the school-related anxiety (r=.161, p=.003), environment-related anxiety (r=.251, p=.000), and technology-related anxiety (r=.170, p=.001). This means that students' preparation for modular distant learning has an impact on their school-related anxiety, environmental-related anxiety, and technology-related anxiety. It means further that the academic preparation of students on their new learning modality affects their psychological well-being.

Table 5.1 further shows that the mathematics performance of the students and their pandemic-related anxiety in math learning are not also correlated. More specifically, it was found that mathematics performance of the students does not influence the school-related anxiety (r=.018, p=.732), personal-related anxiety (r=.027, p=.615), environment-related anxiety (r=-.099, p=.064), and technology-related anxiety (r=-.020, p=.709).

This result contradicts Christiansen's [23] finding that mathematics anxiety yields negative student performance. The finding of Al-Shannaq and Leppavirta [24] that there is a relationship between math anxiety and math performance was also negated in this part of the study.

Moreover, result of the analysis revealed that there is no significant relationship between the access to internet connection and the pandemic-related anxiety in math learning in terms of school-related anxiety (r=-.022, p=.677), personal-related anxiety (r=-.099, p=.066), environment-related anxiety (r=-.031, p=.558), and technology-related anxiety (r=-.021, p=.699).

In the study of Kabir et al. [25], it was revealed that students who were at sub-optimal levels of readiness or underprepared usually experienced moderate to high level of e-learning stress.

Table 5.1. Relationship between the Students' Profile and the Pandemic-Related Anxiety in Math Learning

		School-Related Anxiety	*Personal-Related Anxiety*	*Environment-Related Anxiety*	*Technology-Related Anxiety*
Number of available learning devices at home	Pearson Correlation	.093	.000	-.070	-.088
	Sig. (2-tailed)	.084 Not Significant	.993 Not Significant	.192 Not Significant	.099 Not Significant
Readiness for modular distance learning	Pearson Correlation	**.161**	.065	**.251**	**.170**
	Sig. (2-tailed)	**.003*** **Significant**	.223 Not Significant	**.000*** **Significant**	**.001*** **Significant**
Math performance	Pearson Correlation	.018	.027	-.099	-.020
	Sig. (2-tailed)	.732 Not Significant	.615 Not Significant	.064 Not Significant	.709 Not Significant
Internet Access	Pearson Correlation	-.022	-.099	-.031	-.021
	Sig. (2-tailed)	.677 Not Significant	.066 Not Significant	.558 Not Significant	.699 Not Significant

*Significant at p<.05

To test the hypothesis on the relationship between the parents' profile and the pandemic-related anxiety in math learning, the Pearson Product Moment Coefficient of Correlation was used at a 0.05 margin of error.

As reflected in Table 5.2, the father's educational attainment is positively correlated with the pandemic-related anxiety in math learning in terms of school-related anxiety (r=.118, p=0.028) and personal-related anxiety (r=.113, p=0.035). This means that the school-related and personal-related anxieties are affected by the father's educational attainment. This suggests that increasing the education level of the fathers connotes great occupation and higher responsibilities, thus probably neglecting their fraternal obligations, causing school and personal-related anxieties among the learners.

On the contrary, it was revealed that the father's educational attainment had no significant relationship with environment-related anxiety (r=-.022, p=0.996) and technology-related anxiety (r=-.013, p=0.801). It means that the environment-related anxiety and technology-related anxiety are not affected by the educational attainment of their fathers.

On the other hand, it was found that the mother's educational attainment is not associated to the pandemic-related anxiety in math learning in terms of school-related anxiety (r=.085, p=.112), personal-related anxiety (r=.064, p=.235), environment-related anxiety (r=-.030, p=.577), and technology-related anxiety (r=-.014, p=.788).

Furthermore, it was revealed that the parents' monthly income and the pandemic-related anxiety in math learning are not significantly associated. Specifically, the pandemic-related anxiety in math learning in terms of school-related anxiety (r=.075, p=.178), personal-related anxiety (r=.072, p=.182), environment-related anxiety (r=.023, p=.673), and technology-related anxiety (r=.043, p=.418) is not affected by the parents' monthly income.

With regard to the parents' profile in terms of the number of hours spent per week for assisting their children in answering their modules, it was revealed that the number of hours spent per week did not influence the pandemic-related anxiety in math learning in terms of school-related anxiety (r=-.098, p=.067), personal-related anxiety (r=-.103, p=.053), and technology-related anxiety (r=-.095, p=.075). However, it was found that the number of hours spent per week for assisting their children in answering their modules is negatively correlated to the environment-related anxiety (r=-.161, p=.002). It goes to show that the environment-related anxiety is affected by number of hours spent by the parents in assisting their children in answering their modules. It means that the more time parents devote to assisting their children, the less anxiety the students experience as a result of their support.

Table 5.2. Relationship between the Parents' Profile and the Pandemic-Related Anxiety in Math Learning

		School-Related Anxiety	*Personal-Related Anxiety*	*Environment-Related Anxiety*	*Technology-Related Anxiety*
Father's educational attainment	Pearson Correlation	**.118**	**.113**	-.002	-.013
	Sig. (2-tailed)	**.028* Significant**	**.035* Significant**	.966 Not Significant	.801 Not Significant
Mother's educational attainment	Pearson Correlation	.085	.064	-.030	-.014
	Sig. (2-tailed)	.112 Not Significant	.235 Not Significant	.577 Not Significant	.788 Not Significant
Monthly Income	Pearson Correlation	.072	.072	.023	.043
	Sig. (2-tailed)	.178 Not Significant	.182 Not Significant	.673 Not Significant	.418 Not Significant
Number of hours spent per week for assisting their children in answering their	Pearson Correlation	-.098	-.103	**-.161**	-.095
	Sig. (2-tailed)	.067 Not Significant	.053 Not Significant	**.002* Significant**	.075 Not Significant

*Significant at p<.05

To test the hypothesis on the relationship between the teachers' profile and the pandemic-related anxiety in math learning, the Pearson Product Moment Coefficient of Correlation was also used at a 0.05 level of significance.

Table 5.3 shows that the number of trainings attended by the teachers related to modular distance learning had no significant relationship to the pandemic-related anxiety in math learning in terms of school-related anxiety (r=.072, p=.180), personal-related anxiety (r=.030, p=.580), and environment-related anxiety (r=-.090, p=.091). On the contrary, it was found out that the number of trainings attended related to modular distance learning and the technology-related anxiety (r=.163, p=0.002) are positively correlated. This shows that the pandemic-related anxiety in math learning in terms of technology-related anxiety is affected by the number of training sessions attended by the teachers related to modular distance learning. This means that the more the teachers attend trainings and seminars, the greater the possibility that they will apply e-learning approach during the pandemic and eventually require the students to use gadgets or other high-tech devices, thus increasing their technology-related anxiety.

Table 5.3 also shows that the teacher's practices in teaching math are significantly correlated to the pandemic-related anxiety in math learning in terms of school-related anxiety (r=.164, p=.002), personal-related anxiety (r=.199, p=.000), environment-related anxiety (r=.256, p<0.05), and technology-related anxiety (r=.261, p=.000). This means that the math teaching practices of the teachers had a direct impact on the pandemic-related anxiety of the students. This suggests that the students experienced less math anxiety during the pandemic when their math teachers had very satisfactory teaching practices.

The finding of Hasbee, et al. [26], that the teaching practices of teachers have a significant impact on the level of mathematics anxiety, was confirmed in this part of the study.

Table 5.3. Relationship between the Teachers' Profile and the Pandemic-Related Anxiety in Math Learning

		School-Related Anxiety	*Personal-Related Anxiety*	*Environment-Related Anxiety*	*Technology-Related Anxiety*
Number of trainings attended related to modular distance learning	Pearson Correlation	.072	.030	.090	**.163**
	Sig. (2-tailed)	.180 Not Significant	.580 Not Significant	.091 Not Significant	**.002*** **Significant**
Teachers' practices in teaching math	Pearson Correlation	**.164**	**.199**	**.256**	**.261**
	Sig. (2-tailed)	**.002*** **Significant**	**.000*** **Significant**	**.000*** **Significant**	**.000*** **Significant**

*Significant at p<.05

Conclusions

Based on the findings of the study, the following conclusions were drawn:

1. There is an insufficient availability of learning devices among the student-respondents. The students are not very much prepared posed by COVID-19 in the field of basic education. The number of high school students who had a higher level of proficiency is slightly greater than the learners who had the highest academic standing in mathematics. This is an indication that students' mathematics performance is not seriously affected or disrupted by the sudden shift of modality of learning. The students had internet access that could be used in their school-related activities.

2. The fraternal knowledge support gained by the students is lower considering the high school qualification of their fathers. The knowledge support of female parents to their schoolchildren was lower considering the mothers' educational attainment. The majority of the parents were receiving below marginal salaries. The parents were less devoted to their children's schooling during pandemic.
3. The Division of Northern Samar inadequately provides training that could possibly capacitate the teachers in managing the teaching-learning process in the midst of a pandemic through a modular learning approach. The mathematics teachers were effective teachers. It implies that the teaching methods of teachers affect students' performance.
4. The students experienced moderate level of pandemic-related anxiety in mathematics.
5. The students' preparation for modular distant learning has an impact on their school-related anxiety, environmental-related anxiety, and technology-related anxiety. The school-related and personal-related anxieties are affected by the father's educational attainment. The environment-related anxiety is affected by number of hours spent by the parents in assisting their children in answering their modules. The technology-related anxiety is affected by the number of training sessions attended by the teachers related to modular distance learning. The math teaching practices of the teachers had a direct impact on the pandemic-related anxiety of the students.

Recommendations

Based on the findings of this study, the following recommendations are advanced:

1. Positive language, active listening, and empathy should be established at home to maintain a peaceful and happy family environment during this pandemic. Findings from the present study have also indicated that parents should spend more time facilitating and guiding their children in working modular-related activities to minimize students' math anxiety.
2. Ideal and safe coping strategies should be developed by the school to improve the psychological health and well-being of the students. The school may establish a *Friendly Line*, a special helpline, in collaboration with the mental health and psychosocial specialists who can provide direct support and other services needed by the students. Physical and mental exercises, play, and sports should also be encouraged in school to promote communication, interaction, and socialization among the students.
3. DepEd Division of Northern Samar should provide various trainings and seminars to strentghen the teaching and assessment strategies

of teachers during pandemic. Through trainings and seminars, teachers would not only understand the characteristics of varioius technologies as they relate to distance learning for teachers but also ground them in their benefits aand drawbacks as modes of instruction.

4. It is recommended that teachers should improve their teaching practices in order to encourage students to have a good and positive attitude toward mathematics.Likewise, teachers should assess the level of readiness of their students. They can monitor and evaluate their own learning processes and develop self-regulation through their own reflection and constructive feedback from both their teachers and peers. The readiness of the students will make it easier to adjust under any circumstance, thus reducing their anxiety.
5. Other variables such as student's self-efficacy, mathematical skills, emotional factor, and school-led interventions should be given emphasis for further researches and studies along pandemic-related math anxiety. Other researchers may also conduct inteviews to validate the real situation of the anxiety of the students.

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