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Impact of Modular Distance Learning on High School Students Mathematics Motivation, Interest/Attitude, Anxiety and Achievement during the COVID-19 Pandemic

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Abstract: This study examined the impact of modular distance learning on students' motivation, interest/attitude, anxiety and achievement in mathematics. This was done at the Gabaldon, Nueva Ecija, Philippines during the first and second grading of the academic year 2021-2022. The study included both a descriptive-comparative and descriptive-correlational research design. The 207 high school students were chosen using stratified sampling. According to the findings, students have a very satisfactory rating in mathematics. Students agree that they are motivated, enthusiastic, and have a positive attitude toward mathematics. They do, however, agree that mathematics causes them anxiety. When students are subdivided based on sex, their mathematics interest and anxiety differ significantly. However, there was no significant difference in interest/attitude and achievement. When students are divided into age groups, their mathematics motivation, interest/attitude, anxiety, and achievement differ significantly. Students' motivation, anxiety, and achievement differ significantly by year level. There was a positive relationship between and among mathematics motivation, interest/attitude, and achievement. However, there is a negative association between mathematics anxiety and mathematics motivation; mathematics anxiety and mathematical interest/attitude; and mathematics anxiety and mathematical performance. The study's theoretical and practical implications were also discussed, and recommendations for educators and researchers were given.

Keywords: *Mathematics achievement, mathematics anxiety, mathematics interest/attitude, mathematics motivation, modular learning.*

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Introduction

The Coronavirus disease (COVID-19) pandemic shattered the normal flow of the education system, it gives a challenging effort to both teachers and students. Hence, the department of education here in the Philippines, provided different alternative learning modalities, such as online distance learning, blended learning, and modular distance learning (Llego, 2021). According to Montemayor (2020), 93% of public schools nationwide have a gadget that students use in online learning. However, online learning is mostly utilized in cities and provinces with strong internet connections, and in those areas that have weak or don't have internet connections, the preferred mode of learning is modular distance learning. Modular learning is a type of distant learning that use self-learning modules (SLM) that are based on the DepEd's most essential learning competencies (MELCS). The courses include parts on motivation and assessment that serve as a comprehensive overview of both teachers' and students' desired skills (Manlangit et al., 2020). Modular distance learning is very challenging for students and teachers, especially in teaching and learning mathematics subjects, because knowledge and skills are needed for this subject. Moreover, Mathematics subject is one of the subjects that most of the students wants to exclude, how it can be so if it is modular learning. Additionally, throughout the pandemic, there was a decrease in the performance of students in mathematics (Contini et al., 2021).

During this pandemic, students' learning experiences vary; some may face fear and boredom, while others may remain inspired to push forward. In other circumstances, the impact of a pandemic may differ. Student characteristics such as

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behavior, demographic profile, and other external elements influencing learning may all contribute to a student's success or failure. Elastika et al. (2021), show that environment and seating are the factors affecting students' difficulty in learning mathematics. During this epidemic, students' age, gender, year level, and other demographic profile may have an impact on their behavior and mathematical proficiency. According to Richardson et al. (2012), student performance has minimal associations with demographic and psychological contextual factors. Similarly, Gutierrez (2021) demonstrates that a student's gender, monthly income, and parents' work status can all predict a student's math achievement. Andamon and Tan (2018), on the other hand, show that demographic profile and conceptual comprehension in mathematics do not influence students' mathematics performance.

During the epidemic, students, parents, and teachers encountered greater challenges than in face-to-face classes. In terms of economic standing, a larger proportion of the population of high school students on the Gabaldon campus is average or below average. Some parents can afford to provide their children with devices, internet access, and other educational tools, but the majority of parents cannot. Furthermore, although some parents may be able to give gadgets and other materials to augment their children's learning experiences, limited internet access hinders students and teachers' ability to do collaborative online learning. Due to these constraints, the Gabaldon Nueva Ecija, the Laboratory High School of the Nueva Ecija University of Science and Technology - Gabaldon campus, offers modular remote learning to students to deliver knowledge and skills (Nueva Ecija University of Science and Technology [NEUST], 2020). The mathematics teacher provided creative self-learning modules to the students to motivate them. The instructors' mathematics learning modules were based on the Department of Education curriculum guide. The topics for the first and second quarters of grade 7 are number sense and measurement, respectively; for grades 8-10 patterns and algebra, the only difference is the level of complexity; for grade 11 functions and graphs; and for grade 12 pre-calculus (Department of Education [DepEd], 2020). During the pandemic, students were given self-learning modules to study, which were given and collected every week (Nueva Ecija University of Science and Technology [NEUST], 2020). A module is a tool that helps students become more self-sufficient in their learning (Taufikurrahman et al., 2021). In addition, according to Hernando-Malipot (2020), 7.2 million Filipino enrollees prefer modular distance learning, TV and radio, while only 2 million enrollees want online learning. Moreover, modular distance learning keeps the students away from harm, because of lack or limited contact with their teachers and classmates.

It is also important to observe the student's interest, attitude toward mathematics, and motivation to learn mathematics, as these are the aspects that may drive students to perform better in mathematics disciplines. According to Hashim et al. (2021), interest in Mathematics influenced students' attitudes in learning Mathematics. Furthermore, according to Asante (2012), male and female students differ in their interest in mathematics, and the school environment, instructors' attitudes and beliefs, instructional approaches, and parental views were found as determinants of students' attitudes toward mathematics. Moreover, fear of failure, self-efficacy beliefs, and accomplishment goals influenced students' mathematics interest and performance (Pantziara & Philippou, 2015). Similarly, Khayati and Payan (2014) identify school environment, family, undertaking mathematics-related research, its application in daily life and other courses, and learning mathematics history as essential variables that will improve students' interest in mathematics. Collaborative learning, game-based learning, and other strategic techniques can be used to boost interest and attitude toward learning mathematics. However, in the current condition of NEUST Gabaldon students, where modular distance learning is adopted, students may only rely on printed out modules, making it more difficult for teachers to increase students' interest.

Motivation is a critical component in mathematics learning since it pushes students to work harder toward their academic goals. The evidence supporting the link between motivation and accomplishment is shown using longitudinal and cross-cultural comparisons, as well as findings from large-scale international evaluations like the IEA's Trends in International Mathematics and Science Study (TIMSS) (Michaelides et al., 2019). On the other hand, female students are more extrinsically motivated and mastery-oriented than males, and ethnicity is one of the factors that may influence student extrinsic motivation (D'Lima et al., 2014). Furthermore, Palomares-Ruiz and García-Perales (2020) showed that male and female students have significantly different motivations for learning mathematics. According to Bai et al. (2016) many elements, including course instructions and student enthusiasm in learning, might influence students' learning motives. Their findings support previous research on student motivations and interest in learning and its relationship to technology use, which has been shown to have a favorable impact on student motivation to learn through the IGLU module. As a result, the learning modules may have a motivating feature that will pique students' interest in learning Mathematics. On the other hand, according to Bishara (2016), "challenging problem-solving in mathematics" may contribute to the enhancement of students' motivation to learn mathematics, promote student achievement, and improve social relations.

However, mathematical anxiety, which has long been a concern in mathematics education, impedes students' improvement and development in terms of their mathematical competence (James et al., 2013). Zakaria et al. (2012) concluded that when students are divided into groups based on their level of mathematics anxiety, their mathematics achievement differs dramatically. However, when the students are divided into groups based on gender, there is no significant difference in their mathematical anxiety. Gunderson et al. (2018) found that high mathematics achievement was a predictor of lower mathematics anxiety and less entity-oriented motivational frameworks. Moreover, being

younger, a woman, having a lower level of education, being single, having more children, and living in a country or region with a more extreme COVID-19 condition is associated with higher levels of stress (Kowal et al., 2020). Wang and Zhao (2020) also demonstrate that female students tend to have more anxiety than male students. Carey et al. (2017), on the other hand, suggest that male students have slightly higher levels of academic anxiety than female students. They also show that clusters of older students emerge with specifically greater general anxiety or academic anxiety.

The Pandemic COVID-19 had a significant impact on student mathematics performance. According to Sintema (2020), the COVID-19 pandemic is more likely to result in a major decline in the passing rate of high school students in National Examinations if it is not contained as soon as possible. In contrast, Spitzer and Musslick (2021) discovered that students' performance increased significantly before and throughout the shutdown, based on data from over 2,500 K-12 students who computed over 124,000 mathematical problem sets before and after the closure. Furthermore, low-achieving pupils improved significantly more than high-achieving students. The epidemic has varying degrees of impact on mathematics learning. Distance learning arrangements appear to be a viable substitute for in-person learning, at least in an emergency circumstance, but not all students gain equally (Tomasik et al., 2021).

In this literature, the researcher wanted to find out if the mathematics learning modules of high school students have something to do with their Mathematics behavior and performance during the pandemic. Furthermore, the researcher formulated the following questions: 1.) How may the profile of the student respondents be described (sex, age and year level)?; 2.) How may the student's mathematics achievement be described, when grouped according to sex, age and year level?; 3.) How may the mathematics motivation, interest/attitude, and anxiety of the students be described?; 4.) Is there a significant difference in the motivation, interest/attitude, anxiety and academic achievement of the students when grouped according to sex, age and year level?; 5.) Is there a significant relationship between and among students' motivation, interest/attitude, anxiety and mathematics achievement?

Methodology

Research Design

The descriptive comparative and correlational design was used in this investigation. In which the researcher collects data and determines whether there is a difference and link between or among certain variables. The researcher does not anticipate the causal relationship between or among the variables.

To assess the existing differences between and among the variables under study, a comparative descriptive design is used. It compares descriptive data from various categories, such as gender, age, sex, educational level, and so on (Nurse Key, 2017). To quantify and describe how two variables are related, descriptive correlation design is utilized. It's possible that the researcher doesn't know if the variables are related, but suspects that one influences the other. Because no attempt is made to modify an independent variable in a correlational design, the researcher cannot conclude that the association is causal based on correlation alone (Baker, 2017).

Sampling Technique

The Cochran's Formula was used to calculate the 207 respondents from a total population of 447 junior and senior high school students at the NEUST Gabaldon campus who were enrolled in the first and second grading period during the academic year 2021-2022. These high school students utilize self-learning modules as a mode of learning mathematics. The researchers utilized stratified random sampling to select the respondents for equal proportional allocation in each year level. Stratified sampling ensures that each stratum of interest is represented, resulting in a sample population that is representative of the entire population under study (Murphy, 2021). After determining the number of respondents per year level, the researcher used the fishbowl technique to choose the actual respondents per year level. The sample included 38.6% (80) male students and 61.4% (127) female students ranging in age from 12 to 17 years old.

Questionnaires Validity

The questionnaire used a four-point Likert scale, with 1 indicating strongly disagree to 4 indicating strongly agree. The demographic profile of the respondents is presented in the first section of the questionnaire. The questionnaire for mathematics interest/attitude, anxiety, and motivation was presented in the second portion.

To ensure the validity of the adopted questionnaires, 10 items were altered following the local settings. The questionnaire for interest/attitude towards mathematics was adopted from the paper "Relationship between interest and mathematics performance in a technology-enhanced learning context in Malaysia" by Wong, S. L. and Wong, S. L. (2019). This research questionnaire was used to assess students' interest/attitude toward mathematics during the implementation of modular distance learning. The questionnaire for mathematics anxiety was adopted from Ndlovu's (2017) study, "Grade 10-12 learners' attitudes toward mathematics and how attitudes affect performance." During the

modular distance learning, this was utilized to assess the student's mathematics anxiety. The motivation questionnaire, on the other hand, was constructed by the researcher.

The researcher used the Lawshe method to conduct a validity test and enlisted the help of 12 faculty members from the College of Education at the Gabaldon campus of the Nueva Ecija University of Science and Technology to act as raters. Each item is categorized into three categories: essential, beneficial but not essential, and non-essential. The content validity ratio of each item was determined using the formula $CVR = [ne – (N/2)] / (N/2)$, where N is the total number of raters and ne is the number of raters who categorized the item as "essential." The content validity index was calculated using the formula $CVI = \sum CVR's/ No$, where No is the number of items per questionnaire. For 12 raters, the minimum value for the acceptance of content validity ratio and content validity index is 0.667 (Ayre & Scally, 2014).

Table 1. Validity of the questionnaires

The content validity index for mathematics interest/attitude, anxiety, and motivation are 0.883, 0.899, and 0.833, respectively. All CVI scores are larger than the threshold value of 0.667, indicating that all questionnaires are valid.

Questionnaires	Content Validity Index (CVI)	Critical Value	Interpretation
Mathematics Attitude/interest	0.883	0.667	Valid
Mathematics Anxiety	0.899	0.667	Valid
Mathematics Motivation	0.833	0.667	Valid

Questionnaires Reliability

The questionnaires were pre-tested by the researcher on 30 high school student respondents who were not part of the study. Conroy (2016) demonstrates that using Cronbach alpha, a sample size of 30 may be used to calculate the reliability coefficient. The reliability coefficient of the questionnaires was determined using SPSS Cronbach alpha, and they were found to be reliable. The reliability coefficients for mathematical motivation, interest/attitude, and anxiety were 0.98, 0.96, and 0.98, respectively.

Data Collection

The researcher requested authorization from the university's campus director to perform the study. Questionnaires are written in both English and Tagalog to ensure that students fully comprehend them. The questionnaire was attached to the final module during the second grading period of the students. Because students are not permitted to come to school under the University's COVID-19 protocols, the advisers of each grade level distributed the questionnaire to the student's parents/guardians. All potential respondents were guaranteed their confidentiality, and the surveys were accompanied by a cover letter explaining the study and requesting permission to share their data, including their math achievements. After a week, the questionnaire was gathered with the assistance of the class advisers.

Data Analysis

The data was analyzed using IBM-SPSS. The frequency and percentage were used to describe the profile of the students. The achievement of students in mathematics was described using mean and standard deviation when they were grouped by sex, age, and year level. The mathematics motivation, interest/attitude, and anxiety were described using the mean. Comparison on the motivation, interest/attitude, anxiety, and academic performance of the students when group according to sex, t-test for the independent variable was used. MANOVA was used to compare the motivation, interest/attitude, anxiety, and mathematics performance of students when they were grouped by age and grade level, and the Tukey-HSD was employed as a post-hoc test. Correlation between and among students' motivation, interest/attitude and mathematics achievement, Pearson-r was used.

Table 2 shows that the motivation, $w(207) = 0.984, p>.05$, interest/attitude $w(207) = 0.986, p>0.05$, mathematics anxiety $w(207) = 0.983, p>0.05$, and mathematics achievement, $w(207) = 0.950, p>0.05,$ are normally distributed.

Table 2. Normality Test

	Shapiro-Wilk		
	Statistic	**df**	**Sig.**
Motivation	.984	207	.208
Interest/Attitude	.986	207	.386
Mathematics Anxiety	.983	207	.155
Mathematics Achievement	.950	207	.129

The verbal interpretation was used to describe the motivation, interest, and attitude; it ranges from 1.00 – 1.74 for strong disagreement, 1.75 – 2.49 for disagreement, 2.50 – 3.24 for agreement, and 3.25 – 4.00 for a strong agreement.

The Mathematics achievements grading scale and verbal description are as follows: 90–100 is outstanding, 85–89 is very satisfactory, 80–84 is satisfactory, 75–79 is fairly satisfactory, and 74 and below do not meet expectations.

Findings / Results

Students Profile

Table 3 shows that *61.4%* are female respondents and *38.6%* are male respondents. Among the respondents, 14 years old *(28%)* was the greatest, followed by 15 years old *(27.1%*), 13 years old *(13%)*, 12 years old *(12.6%)*, 16 years old *(10.1%)*, and the least is 17 years old *(9.2%)*. Table 3 also shows the distribution of the respondents according to year level, most of them are grade 10 *(32.4%)*, followed by grade 9 *(23.7%)*, grade *(14%)*, grade 8 *(12.1%)*, grade 12 *(9.7%)*, and the least is grade 11 *(8.2%)*.

Table 3 shows the distribution of respondents according to sex, age, and year level.

Students Profile		**Frequency**	**Percent**
Sex	male	80	38.6
	female	127	61.4
	Total	207	100.0
Age	12 years old	26	12.6
	13 years old	27	13.0
	14 years old	58	28.0
	15 years old	56	27.1
	16 years old	21	10.1
	17 years old	19	9.2
	Total	207	100.0
Year Level	Grade7	29	14.0
	Grade8	25	12.1
	Grade9	49	23.7
	Grade10	67	32.4
	Grade11	17	8.2
	Grade12	20	9.7
	Total	207	100.0

Student's Mathematics Achievement

Male students' mathematics achievement *(M_{ro} = 85, SD = 4.93)* and female students' mathematics achievement *(M_{ro} = 86, SD = 4.92)* are shown in Table 4.

Table 4 also shows the students' math achievement, which is broken down by age. The 12 years old *(M_{ro} = 88, SD = 3.24)*, 13 years old *(M_{ro} = 87, SD = 5.46*), 14 years old *(M_{ro} = 85, SD = 4.88)*, 16 years old *(M_{ro} = 87, SD = 3.94)*, and 17 years old *(M_{ro} = 87, SD = 5.66)* have very satisfactory performance in mathematics. While the 15 years old *(M_{ro} = 82, SD = 4.24)* students have satisfactory performance.

In terms of year level the grade 7 students have the highest mean *(M_{ro} = 88, SD = 3.00)*, followed by grade 12 students *(M_{ro} = 87, SD = 5.71)*, grade 8 *(M_{ro} = 86, SD = 6.09)*, grade 9 *(M_{ro} = 88, SD = 3.00)*, grade 11 *(M_{ro} = 86, SD = 4.30)*, and the least is grade 10 *(M_{ro} = 83, SD = 4.38)*.

Table 4. The Mathematics achievement of the students during the pandemic, grouped according to sex, age and year level

Sex	**Rounded off mean (M_{ro})**	**Verbal Description**	**Std. Deviation**
Male	85	Very Satisfactory	4.93502
Female	86	Very Satisfactory	4.92478
Age	**Rounded off mean (M_{ro})**	**Verbal Description**	**Std. Deviation**
12	88	Very Satisfactory	3.24322
13	87	Very Satisfactory	5.45795
14	85	Very Satisfactory	4.88305
15	82	Satisfactory	4.24077
16	87	Very Satisfactory	3.93882
17	87	Very Satisfactory	5.65892

Table 4. Continued.

Year Level	Rounded off mean (M_{ro})	Verbal Description	Std. Deviation
Grade 7	88	Very Satisfactory	3.00410
Grade 8	86	Very Satisfactory	6.09152
Grade 9	86	Very Satisfactory	4.29345
Grade 10	83	Satisfactory	4.37702
Grade 11	86	Very Satisfactory	4.30202
Grade 12	87	Very Satisfactory	5.71494

Student's mathematics motivation, interest/attitude, and anxiety

Table 5 shows that the students strongly agree that they are inspired to complete every activity in a modular class, they have the greatest desire to achieve the highest possible grade in math, that if they study the modules very carefully, they will learn better in mathematics, they will learn more in math, if they study the modules thoroughly, and they are motivated to learn and acquire more knowledge in mathematics. On the other hand, students agree that they like to solve mathematical problems, because there are no time limits in this modular class, they would choose to study mathematics over any other subject during this modular learning, they are confident that they can master even the most difficult aspects of mathematics, they are looking forward to the learning modules in math class, and they would like more exercises in modular math class that will help them learn better, even if they will not boost their grades. Overall, they are agreed *(M = 3.08)* that they are motivated to learn mathematics in this modular class.

Table 5 also shows the student's interest/attitude towards mathematics. The students strongly agree that studying advanced mathematics is useful, that mathematics is one of the most important subjects for people to study, mathematics is important in everyday life, mathematics helps develop the mind and teaches a person to think, they want to develop their mathematical skills, and strong maths background will help them in their professional life. On the other hand, the students are agreeing that they like mathematics, they are interested in mathematics, they feel happy when it comes to working on mathematics, they want to know all about how to do mathematics problems, they are excited when a new mathematics topic is announced, they choose to work on mathematics, they want to know all about mathematics, they love to spend many hours working on mathematics, they want to talk about mathematics with their friends, they are too involved in mathematics, they plan to take as much mathematics as they can during their education, they are willing to take more than the required amount of mathematics, they would prefer to write a maths assignment than write an essay, and .they expect to do fairly well in their math's class. Overall, the students agree *(M = 3.02)* that they are interested in mathematics, which indicates a good attitude towards it.

Mathematics anxiety was also shown in table 5. The data shows that the students are agreeing that their mind goes blank and they are unable to think clearly when working with numbers, it makes them uneasy to even think of having to do a mathematics problem, they are always under terrible strain in math class, they hesitate to do math problems, studying mathematics makes them feel nervous/uneasy, and mathematics is one of the most feared subjects. On the contrary, students disagree that mathematics makes them feel uncomfortable, mathematics makes them feel irritable, they would like to avoid mathematics courses in future, and they dislike mathematics. Overall, the students agree *(M = 2.58)* that they have anxiety in learning mathematics even in modular class.

Table 5. The student's mathematics motivation, interest/attitude, and anxiety.

Motivation	Mean	Verbal Interpretation
1. I'm inspired to complete every activity in this modular class.	3.31	Strongly Agree
2. Because there are no time limits in this modular class, I like to solve mathematical problems.	2.84	Agree
3. During this modular learning, I would choose to study mathematics over any other subject.	2.59	Agree
4. I am confident that I can master even the most difficult aspects of mathematics.	2.76	Agree
5. My greatest desire is to achieve the highest possible grade in math.	3.23	Strongly Agree
6. If I study the modules very carefully, I will learn better in mathematics.	3.44	Strongly Agree
7. I will learn more in math if I study the modules thoroughly.	3.30	Strongly Agree
8. In math class, I am looking forward to the learning modules.	3.06	Agree
9. I would like more exercises in modular math class that will help me learn better, even if they will not boost my grades.	3.03	Agree
10. I am motivated to learn and acquire more knowledge in mathematics.	3.26	Strongly Agree
Average	**3.08**	**Agree**

Table 5. Continued

Interest/Attitude	Mean	Verbal Interpretation
1. I like mathematics.	2.81	Agree
2. I am interested in mathematics.	2.98	Agree
3. I feel happy when it comes to working on mathematics.	2.75	Agree
4. I want to know all about how to do mathematics problems.	3.17	Agree
5. I am excited when a new mathematics topic is announced.	2.84	Agree
6. I choose to work on mathematics.	2.77	Agree
7. I want to know all about mathematics.	3.14	Agree
8. I love to spend many hours working on mathematics.	2.71	Agree
9. I want to talk about mathematics with my friends.	2.82	Agree
10. I am too involved in mathematics.	2.65	Agree
11. I plan to take as much mathematics as I can during my education	2.89	Agree
12. I am willing to take more than the required amount of mathematics	2.78	Agree
13. I think studying advanced mathematics is useful	3.30	Strongly Agree
14. I would prefer to write a maths assignment than write an essay	2.84	Agree
15. I expect to do fairly well in my maths class.	3.01	Agree
16. Mathematics is one of the most important subjects for people to study.	3.34	Strongly Agree
17. Mathematics is important in everyday life.	3.33	Strongly Agree
18. Mathematics helps develop the mind and teaches a person to think.	3.36	Strongly Agree
19. I want to develop my mathematical skills.	3.42	Strongly Agree
20. A strong maths background will help me in my professional life.	3.44	Strongly Agree
Average	**3.02**	**Agree**
Mathematics Anxiety	**Mean**	**Verbal Interpretation**
1. My mind goes blank and I am unable to think clearly when working with numbers.	2.83	Agree
2. It makes me uneasy to even think of having to do a mathematics problem.	2.83	Agree
3. I am always under terrible strain in maths class.	2.68	Agree
4. I hesitate to do maths problems.	2.68	Agree
5. Studying mathematics makes me feel nervous/uneasy.	2.79	Agree
6. Mathematics makes me feel uncomfortable.	2.46	Disagree
7. Mathematics makes me feel irritable.	2.36	Disagree
8. I would like to avoid mathematics courses in future	2.32	Disagree
9. Mathematics is one of the most feared subjects	2.72	Agree
10. I dislike mathematics.	2.15	Disagree
Average	**2.58**	**Agree**

Comparison of male and female mathematics motivation, interest/attitude, anxiety, and academic achievement during the pandemic.

Table 6 shows a significant difference between the male and female groups in terms of their motivation, $t(205) = 2.49$, $p < 0.05$, and mathematics anxiety, $t(205) = 2.43$, $p < 0.05$. However, there is no significant difference between male and female in terms of their interest/attitude, $t(205) = 1.37$, $p > 0.05$, and mathematics achievement, $t(205) = 1.77$, $p > 0.05$.

Table 6. The comparison of male and female mathematics motivation, interest/attitude, anxiety, and academic achievement during the pandemic.

	Sex	N	Mean (M)	t	df	Sig. (2-tailed)	Cohen's d	Effect size
Motivation	male	80	2.9850	-2.49	205	0.013	0.35	Medium
	female	127	3.1433					
Interest/Attitude	male	80	2.9606	-1.37	205	0.173		
	female	127	3.0531					
Mathematics Anxiety	male	80	2.7038	2.43	205	0.016	0.35	Medium
	female	127	2.5055					
Mathematics Achievement	male	80	84.5000	-1.77	205	0.078		
	female	127	85.7480					

Multivariate significance test for age with the dependent variables mathematics motivation, interest/attitude, anxiety, and academic achievement.

Results of the MANOVA yielded that there was a statistically significant difference between and among the age group on the combined dependent variables, *Wilks' A = 0.706, F = 3.646, p< 0.01.* The effect size was medium, *partial η^2 = 0.083.* The observed power of 1.00 indicates that there was a 100% chance that the results could have come out significant.

Table 7. Multivariate significance test for age

Wilks' Lambda	Value	F	Sig.	Partial Eta Squared	Observed Power[d]
Age	.706	3.646	.000	.083	1.000

Post hoc test for motivation grouped according to age.

Table 8 shows that 12-year-old students' motivation differs significantly from that of 14-, 15-, and 16-year-old students, implying that 12-year-old students are more motivated to learn mathematics during this pandemic than students aged 14, 15, and 16. However, there is no significant difference across 12-, 13-, and 17-year-old students, as well as across ages 13, 14, 15, 16, and 17, indicating that motivation is comparable across these groups.

Table 8. The post hoc test for motivation, grouped according to age.

	Age	N	Subset for alpha = 0.05		
			a	b	
Tukey HSD[a,b]	16 years old	21	2.9810		a
	15 years old	56	2.9821		a
	14 years old	58	3.0414		a
	13 years old	27	3.0778	3.0778	ab
	17 years old	19	3.2053	3.2053	ab
	12 years old	26		3.3846	b
	Sig.		.381	.089	

**Different letters are significantly different.*

Post hoc test for interest/attitude grouped according to age

Table 9 shows that the mathematics interest/attitude of 12-year-old students differs significantly from that of students aged 15 and 16, indicating that 12-year-old students are more interested in and have a positive attitude toward mathematics during the Covid-19 pandemic than students aged 15 and 16. A significant difference between ages 16 and 17 was also observed, implying that 17-year-old students are more interested in and have a good attitude toward mathematics. However, there is no statistically significant difference across ages 13, 14, 15, and 16; across ages 13, 14, 15, and 17; and across ages 12, 13, 14, and 17.

Table 9. The post hoc test for interest/attitude, grouped according to age.

	Age	N	Subset for alpha = 0.05			
			a	b	c	
Tukey HSD[a,b]	16 years old	21	2.7881			a
	15 years old	56	2.9464	2.9464		ab
	13 years old	27	2.9667	2.9667	2.9667	abc
	14 years old	58	3.0026	3.0026	3.0026	abc
	17 years old	19		3.2079	3.2079	bc
	12 years old	26			3.3019	c
	Sig.		.490	.265	.068	

**Different letters are significantly different.*

Post hoc test for mathematics anxiety, grouped according to age

Table 10 shows that the mathematics anxiety of 12-year-old children differs significantly from that of 13-, 15-, and 17-year-old students, implying that 12-year-old students have less anxiety in mathematics than students aged 13, 15, and 17. However, no differences exist between and among the ages of 12, 14, and 16. Similarly, no significant differences exist between and among the ages 13, 14, 15, 16, and 17. This suggests that the mathematics anxiety of these age groups is comparable.

Table 10. The post hoc test for mathematics anxiety, grouped according to age.

	Age	N	Subset for alpha = 0.05		
			a	b	
Tukey HSD[a,b]	12 years old	26	2.1692		a
	14 years old	58	2.5121	2.5121	ab
	16 years old	21	2.5905	2.5905	ab
	13 years old	27		2.6111	b
	17 years old	19		2.7053	b
	15 years old	56		2.7875	b
	Sig.		.050	.418	

**Different letters are significantly different.*

Post hoc test for mathematics achievement grouped according to age

Table 11 shows that 15-year-old students' mathematics achievement differs significantly from that of students aged 12, 13, 16, and 17, suggesting that 15-year-old students perform poorly compared to students aged 12, 13, 16, and 17. However, there is no statistically significant difference between the ages 14 and 15. Similarly, there are no substantial differences between ages 12, 13, 14, 16, and 17. Indicating that these age groups are comparable in terms of mathematical achievement.

Table 11. The post hoc test for mathematics achievement, grouped according to age.

	Age	N	Subset for alpha = 0.05		
			a	b	
Tukey HSD[a,b]	15 years old	56	82.3750		a
	14 years old	58	85.2586	85.2586	ab
	13 years old	27		86.5926	b
	17 years old	19		86.6316	b
	16 years old	21		86.7143	b
	12 years old	26		87.9615	b
	Sig.		.176	.237	

**Different letters are significantly different.*

Multivariate significance test for year level with the dependent variables mathematics motivation, interest/attitude, anxiety, and academic achievement.

The MANOVA test showed that there was a significant difference between and among year levels on the combined dependent variables, *Wilk's A = 0.721, F = 3.411, p < 0.01.* Effect size was medium, *partial $\eta^2 = 0.083$.* There was a 99.9% chance that the results could have come out significant, *observed power = 0.999*.

Table 12. Multivariate significance test for year level

Wilks' Lambda	Value	F	Sig.	Partial Eta Squared	Observed Power[d]
Year Level	.721	3.411	.000	.079	.999

Post hoc test for motivation, grouped according to year level

Table 13 indicates that the only significant differences in motivation are between grades 10 and 7, suggesting that grade 7 students are more motivated than grade 10 students. On the other hand, motivation is comparable between and among grades 8, 9, 10, 11, and 12. Also, mathematics motivation is comparable in grades 7, 8, 9, 11, and 12.

Table 13 shows the post hoc test for motivation, grouped according to year level.

	Year Level	N	Subset for alpha = 0.05		
			a	b	
Tukey HSD[a,b]	Grade10	67	2.9612		a
	Grade11	17	3.0000	3.0000	ab
	Grade9	49	3.0898	3.0898	ab
	Grade12	20	3.1150	3.1150	ab
	Grade8	25	3.1480	3.1480	ab
	Grade7	29		3.3172	b
	Sig.		.618	.086	

**Different letters are significantly different.*

Post hoc test for mathematics anxiety, grouped according to year level

Table 14 reveals that the mathematics anxiety of students in grades 7 differs significantly from that of students in grades 10 and 12, indicating that grade 7 students had less anxiety than students in grades 10 and 12. However, mathematical anxiety in grades 7, 8, 9, and 11 are comparable. Similarly, mathematics anxiety in grades 8, 9, 10, 11, and 12 are comparable.

Table 14 shows the post hoc test for mathematics anxiety, grouped according to year level.

	Year Level	N	Subset for alpha = 0.05		
			a	b	
Tukey HSD[a,b]	Grade7	29	2.2517		a
	Grade11	17	2.4412	2.4412	ab
	Grade9	49	2.5265	2.5265	ab
	Grade8	25	2.5480	2.5480	ab
	Grade12	20		2.6850	b
	Grade10	67		2.7836	b
	Sig.		.362	.207	

**Different letters are significantly different.*

Post hoc test for academic achievement grouped according to year level

Table 15 demonstrates that the mathematics achievement of grade 10 students differs significantly from that of grades 7 and 12, indicating that grade 10 students perform poorly in comparison to grades 7 and 12. Mathematical achievement, on the other hand, is comparable across and among students in grades 8, 9, 10, and 11. Similarly, math achievement is comparable between and among students in grades 7, 8, 9, 11, and 12.

Table 15 shows the post hoc test for academic achievement, grouped according to year level

	Year Level	N	Subset for alpha = 0.05		
			a	b	
Tukey HSD[a,b]	Grade10	67	82.5672		a
	Grade11	17	85.5882	85.5882	ab
	Grade8	25	85.7600	85.7600	ab
	Grade9	49	86.0612	86.0612	ab
	Grade12	20		87.3500	b
	Grade7	29		88.1034	b
	Sig.		.057	.326	

**Different letters are significantly different.*

Correlation between and among students' motivation, interest/attitude, anxiety and academic achievement in mathematics during the pandemic

Table 16 demonstrates a highly significant positive relationship between students' motivation and interest/attitude toward mathematics, $r(205) = 0.738, p<0.01,$ as well as motivation and mathematics achievement, $r(205) = 0.233, p<0.01.$ There is also a significant positive link between interest/attitude and math achievement, $r(205) = 0.107, p<0.05.$ A negative highly significant relationship was found between mathematics motivation and anxiety $r(205) = -0.251, p<0.01,$ mathematics interest/attitude and mathematics anxiety, $r(205) = -0.387, p<0.01,$ and mathematics anxiety and achievement $r(205) = -0.192, p<0.01.$

Table 16 shows the correlation between and among students' motivation, interest/attitude, anxiety and academic achievement in mathematics.

		Motivation	Interest/Attitude	Mathematics Anxiety	Mathematics Achievement
Motivation	Pearson Correlation	1	.738**	-.251**	.233**
Interest/ Attitude	Pearson Correlation	.738**	1	-.387**	.107*
Mathematics Anxiety	Pearson Correlation	-.251**	-.387**	1	-.192**
	N	207	207	207	207

***. Correlation is significant at the 0.01 level (2-tailed).*

**. Correlation is significant at the 0.05 level (2-tailed).*

Discussion

According to the data, there are more female high school students on the NEUST Gabaldon campus than male high school students. It also shows that the majority of them are 14 and 15 years old, with the majority of these students being in grades 9 and 10. This is attributable to the fact that these two-year levels each have two sections. Furthermore, during the pandemic, the NEUST Gabaldon campus had low enrollment statistics in lower grades or year levels. As a result of the spike of COVID-19 cases during this period, enrollment in both public and private schools dropped from 27.7 million in 2019 to 23 million during the pandemic (Philippine News Agency [PNA], 2021). This low enrollment rate is due to the fact some parents did not enroll their children because they encountered various challenges during the pandemic, such as the delivery of instruction; unsatisfactory learning outcomes; financial difficulties while working for the family during lockdown; struggle with the use and availability of technology; and personal problems related to health, stress, and learning style (Agaton & Cueto, 2021).

Data also shows that both female and male high school students perform very satisfactorily in mathematics. Furthermore, their mean difference is just 1 and their standard deviations are not substantially different, leading to the preliminary assumption that male and female groups perform similarly in mathematics during this pandemic. According to Vergara (2021), during the COVID-19 pandemic, students perform well in mathematics, and the majority of them have high levels of value and mastery-approach goals.

Table 4 shows that students aged 12 have the highest mean of 88 and the lowest standard deviation of 3.24, implying that these students have a good distribution of grades, — in other words, their grades are not as dispersed as students of other ages. The 16-year-olds came in second, with a mean of 87 and a standard deviation of 3.94. The 17, 13, and 14-year-olds have very satisfactorily scores, but the highest standard deviation of 5.66, 5.46 and 4.88, respectively, implying that these students' grades are much more distributed from the mean than the other age groups. The age 15 students have a mean of 82 which can be interpreted as satisfactory.

As an initial assessment, the data suggest that grade 7 students' performance is better than that of other year levels since it has the lowest standard deviation, implying that the student's grades are not as far out from the mean as those of other year groups. It also signifies that the students in this grade are catered to well by their teachers. Even though the students in grades 8, 9, and 12 have excellent grades, their achievements are widely dispersed. Grade 10 students, on the other hand, have the lowest achievement and a wide range of grades from the mean, implying that some students are not well-served by their teachers. This also implies that the COVID-19 pandemic disrupted instructions and student learning. According to Yıldırım (2021), the COVID-19 pandemic has several detrimental effects on preschool education, even when there are additional activities. Furthermore, obstacles arise throughout the transition of the teaching and learning process, such as the difficulty of engaging both students and parents, a lack of school guidelines, and students' access to gadgets and the internet (Francom et al., 2021).

On the other hand, high school students are inspired to do their activity in mathematics, because they have the greatest desire to have great grades on it, even amid the COVID-19 pandemic. They are motivated to acquire knowledge and skills in mathematics even the only way to learn is through modules. Rahiem (2021) also demonstrated that even amid a pandemic, students retain their eagerness to learn, and this motivation comes from various areas such as personal, societal, and environmental, implying intrinsic and extrinsic motivation.

Similarly, students have a positive attitude toward learning mathematics; they believe that acquiring mathematical skills would improve their way of life. When students discuss it with one another and spend time working on mathematical issues, they feel excited and happy. It demonstrates that high school students never lose their desire to learn more, even in the face of adversity. Segarra and Julià (2021) demonstrate in their research work utilizing a mathematical attitude questionnaire that the 194 students who responded have a positive attitude toward learning mathematics.

Nonetheless, the students are anxious when it comes to mastering mathematics. Even in a modular class where there is little pressure to answer problems, students get the impression that mathematics is a dreaded subject. When it comes to working numbers, they are anxious and their minds go blank. According to Derling et al. (2021), under the worst-case scenario, students' math anxiety increased during the pandemic. On the other hand, during the COVID-19 pandemic, mathematics self-concept has a direct impact on student learning but not mathematics anxiety (Delima & Cahyawati, 2021). Hence, mathematics anxiety in students is a problem that educators must address, even in face-to-face classes. Christiansen (2021) determined that mathematics anxiousness is a serious problem in a typical classroom.

According to the findings, females are more motivated to learn mathematics than males. Adamma et al. (2018) also noted that their findings show that the female group is more intrinsically motivated. Furthermore, according to Cheng et al. (2021), male students show a more unfavorable ethical attitude than female students. This shows that the modules do not cater to both male and female students and that the modules supplied to them during the pandemic have a stronger positive impact on encouraging female students than male students. Furthermore, because teacher instruction and facilitation are limited in distance learning, motivating students is more difficult than in face-to-face

learning. Similarly, teachers are unable to personally monitor and assess their students' behavior, making prompt intervention difficult to implement.

Male students, on the other hand, have a higher rate of mathematics anxiety than female students, which may tend to male students less eager to learn mathematics. Female students, according to Akbayir (2019), had lower levels of mathematics anxiety than male students. The findings also show that modular learning had a more negative impact on male students than female students during the COVID-19 pandemic. Furthermore, male students are less satisfied with their academic work/life during the COVID-19 pandemic (Aristovnik et al., 2020).

On the other hand, the interests/attitudes of male and female students are not significantly different, implying that both male and female students are comparable in terms of their attitude/interest in mathematics. Suwono et al. (2019), also observed no significant findings on the differences in the attitude of male and female students towards mathematics. This also implies that the module of the students has no varying impact in terms of igniting the students' interest in learning mathematics. This also implies that the impact of the pandemic on students' interest/attitude toward learning mathematics is comparable between the male and female groups.

The data also show that male and female students' academic achievement is not significantly different, implying that the students' mathematical skill is comparable. In addition, the module presented to the students caters to their sex differences. According to Agnoli et al. (2021), Males outperformed girls in model comparisons, but the likelihood of a stereotype threat effect was small, leading the researchers to conclude that stereotype threat effects do not explain teenage gender differences in mathematics in Italy. Furthermore, gender differences in mathematical achievement had no impact during the COVID-19 epidemic.

The data reveals that when students are grouped by age, there are disparities in their mathematics motivation, interest/attitude, anxiety, and achievement, implying that the students' mathematics module has impacted their mathematics motivation, interest/attitude, anxiety, and achievement. This also demonstrates that the impact of modular distance learning during the COVID-19 pandemic varies by age.

According to the findings, students aged 12 are more motivated to learn mathematics than students aged 14, 15, and 16. On the other hand, the motivation of students aged 12 is comparable to that of students aged 13 and 17. Similarly, ages 13, 14, 15, 16, and 17 are comparable. The research also suggests that mathematics modules for students aged 12 were more motivating than modules for students aged 14, 15, and 16. The modular learning of students aged 12 is probably more effective than that of students of other ages. According to Próspero et al. (2012), intrinsic motivation was shown to be higher in younger high school students and Hispanic students than in older college students and non-Hispanic students. This suggests that, in terms of mathematical motivation, younger students were not as negatively impacted by the pandemic as older students. It means that, despite the pandemic, younger students are more eager to learn mathematics.

According to the findings, students aged 12 are more interested in and positive about learning mathematics than students aged 15 and 16. It also implies that the module for 12-year-old students piques their attention and reinforces their positive attitude toward mathematics study. Similarly, 15-year-old students are more interested in and have a more favorable attitude toward mathematics than 16-year-old students. Vidić and Duranović (2020) discovered a similar finding, stating younger students had a more positive attitude than older students, who had a lower perception of their teachers' support, enthusiasm, and classroom management. Furthermore, according to Kamarianos et al. (2020), during the crisis, the majority of young students had little difficulty adapting to new modes of learning. The data also suggest that the pandemic has a greater negative impact on older students' interest/attitude toward learning mathematics than on younger students.

According to the findings, students aged 12 had less anxiety in mathematics than students aged 13, 15, and 17. It also implies that students aged 12 did not experience much anxiety while learning during the pandemic. Furthermore, learning modules for students aged 12 have a good impact on the students' emotional state. The data also shows that the pandemic has a relatively small negative impact on younger students' anxiety than it does on older students. According to Chaman and Callingham (2013), younger students experience less mathematical anxiety than older students. Mutodi and Ngirande (2014) also discovered that students aged 21 and up have a higher level of anxiety than students aged 16 to 20.

According to the statistics, students aged 15 are the lowest-performing cohort when compared to students aged 12, 13, 16, and 17. While the performance of 14 and 15-year-olds is comparable. Similarly, math achievement at the ages of 12, 13, 14, 16, and 17 is comparable.

The data also shows that the modular learning of the different year levels impacted them in terms of motivation, mathematics anxiety and mathematics achievement. Whereas, the mathematics interest/attitude did not significantly differ in each year level.

This suggests that students in grade 7 are more motivated to learn mathematics than students in grade 10. This finding is consistent with table 8, which shows that younger students are more eager to study. This also implies that grade 7

students' learning modules have a favorable impact on their motivation. Vongkulluksn et al. (2018) discovered that students in lower-level classes exhibit higher levels of positive emotions than students in higher-level classes. In terms of motivation, however, the impact of modular learning on grades 8, 9, 10, 11, and 12 is comparable. In addition, the impacts of modular learning on motivation in grades 7, 8, 9, 11, and 12 are comparable.

According to the data, students in grades 7 are less anxious about mathematics than students in grades 10 and 12. It means that students in grade 7 have a favorable perception of this modular learning. It also demonstrates that students in grade 7 adjust to the new way of learning in mathematics more quickly than students in grades 10 and 12. Furthermore, Vongkulluksn et al. (2018) found that lower-level students were less frustrated than senior students.

Data suggest that students in grade 10 perform worse than students in grades 7 and 12. It means that in this time of the COVID-19 pandemic, students in grade 10 have a greater difficulty understanding mathematics. As stated in table 14, these are the students with the highest mean in terms of mathematics anxiety. And, as seen in table 13, grade 10 students had the lowest motivation mean. As preliminary findings, motivation and anxiety affect students' mathematics performance.

According to the findings, students that are highly driven are more engaged in and have a positive attitude about mathematics. Similarly, students who are interested in and have a favorable attitude about learning mathematics are more driven to do so. According to Jufrida et al. (2019), mathematics motivation and interest are highly connected.

On the other hand, motivation has a direct relationship with mathematical achievement. It means that students who are motivated to learn using modules outperform their peers in mathematics class. According to Adamma et al. (2018), mathematics motivation can boost math achievement.

Their interest in and attitude toward learning mathematics has a direct impact on their maths performance. It means that students with an interest in and a good attitude toward learning mathematics are more likely to be academically prepared in mathematics. Capuno et al. (2019) determined that a student's enthusiasm and learning routine had an impact on his or her mathematical performance. Furthermore, Zhang et al. (2020) showed that students' affective attitudes had an association with their mathematical achievement.

As expected, there is a negative relationship between mathematical motivation and anxiety. According to the findings, students who are anxious about mathematics may be less motivated. Similarly, students who are unmotivated to learn mathematics generate anxiety in mathematics. In their study, Li and Cho et al. (2021) similarly found a negative association between mathematics fear and motivation. Furthermore, Nola et al. (2021) indicate that throughout the pandemic, individual interests were inversely connected to anxiety.

Similarly, mathematics interest/attitude is adversely connected to mathematics anxiety. According to the findings, students who are anxious about mathematics exhibit less interest or a negative attitude toward mathematics. Furthermore, students who are uninterested in mathematics or who have a negative attitude toward mathematics are more likely to be anxious. According to Saha et al. (2020), students who acquire a positive attitude toward mathematics may be able to overcome their phobia.

Data also demonstrate that anxiety has a negative impact on students' math performance. This implies that children who are anxious about mathematics likely to perform worse. According to Jamieson et al. (2021), higher levels of mathematics anxiety have a negative impact on students' exam performance. Furthermore, Liang et al. (2020) demonstrate in their study that the COVID-19 pandemic has a significant impact on youth mental health.

The discussions reveal that, during this crisis, students' motivation and interest/attitude toward learning mathematics are very essential to boost, because these are the fuels that allow students to continue their learning. On the other hand, it is vital to alleviate students' anxiety about learning mathematics, because anxiety is a barrier to improved learning outcomes. Furthermore, learning mathematics during the COVID-19 pandemic is extremely challenging, particularly if the learning modality is modular, with students relying only on their own and their parents' assistance. In addition, there are some limitations that students face while participating in distance learning, such as poor internet connectivity, parents' educational backgrounds to support their children's learning, parents' economic status, and the fact that some students live in remote areas, particularly Gabaldon. These limitations are beyond the students' and parents' control.

Based on the data presented, modular distance learning during the COVID-19 pandemic had an impact on the education system, specifically the student's mathematics behavior and performance. These effects may differ depending on the context. According to the study's findings, older students are more negatively impacted than younger students. During the pandemic, modular learning had a huge impact on both students and instructors. Schools, colleges, and universities are being closed, new teaching methodologies are being implemented, and parents and students are experiencing a variety of difficulties, causing the entire educational system to be disrupted (Tarkar, 2020). Furthermore, according to Kuhfeld et al. (2020), missing school for an extended length of time will most likely have a significant impact on student success.

On the other hand, there are several sources of negative emotions during this COVID-19 pandemic; therefore, it is vital to boost students' motivation and interest/attitude toward mathematics for them to learn more efficiently. In addition, parents must participate in the teaching and learning process during this modular learning to reduce mathematics anxiety (Li & Zhang et al., 2021).

Conclusion

The majority of secondary students have very good grades in mathematics. In general, students agree that they are driven to learn mathematics and have a good attitude/interest in doing so. It demonstrates that, despite the uncertainty, students are still motivated and interested in learning mathematics. However, the students all agree that they are anxious about learning mathematics. There are considerable variations amongst the students in terms of mathematics motivation and anxiety. It has been demonstrated that female students are more motivated and experience less anxiety when learning mathematics. However, there are no significant differences between the male and female groups in terms of mathematical interest/attitude and achievement. It means that when students are divided into groups based on sex, modular learning has no impact on math achievement. When students are divided into age groups, there are substantial differences in motivation, interest/attitude, anxiety, and math achievement.

Data suggest that students aged 12 are more motivated than students aged 14, 15, and 16. It also reveals that there is a significant difference in interest/attitude in mathematics between the ages of 16 and 17, 16 and 12, and 12 and 15. Furthermore, students aged 12 are less anxious when learning mathematics than students aged 13, 15, and 17. Furthermore, 12-year-old students have the greatest mean and the lowest standard deviation in terms of mathematics achievement, and their achievement differs greatly from that of 15-year-old students. It means that younger students perform better in mathematics than older students. It also demonstrates that modular learning during pandemics had a greater positive impact on younger students than on older students.

Similarly, significant disparities in student motivation, anxiety, and mathematics achievement were seen when students were grouped according to year level. Those in grade 7 are more motivated than students in grade 10. In addition, students in grades 7 are less anxious than students in grades 10 and 12. Furthermore, grade 7 has the highest mean and lowest variability in mathematical achievement. Furthermore, grade 7 pupils outperform grade 10 students in terms of achievement. According to the data, grade 7 modular learning had a favorable impact on them more than the other ages, followed by grade 12 students. This research reveals that when students are grouped according to age and year level, their modular learning has an impact on them. It also implies that the youngest group's learning modules are considerably more motivating and interesting than the other groups.

On the other hand, there is a positive correlation between and among students' motivation, interest/attitude, and achievement in mathematics. This implies that motivation and interest/attitude may have a positive impact on students' maths performance. Mathematics anxiety is inversely connected to motivation, interest/attitude, and accomplishment in mathematics, implying that anxiety has a detrimental impact on students' mathematics behaviour and achievement. Furthermore, in terms of mathematics motivation and anxiety, male students are more negatively impacted by this pandemic, whereas older students are negatively impacted in terms of mathematics achievement, motivation, interest/attitude and anxiety during this pandemic.

Modular learning during the COVID-19 pandemic had an impact on the educational system, particularly in mathematics learning. In various scenarios, students' motivation, interest/attitude, anxiety, and achievement are impacted. The Covid 19 pandemic shattered the educational system. It places limits on both teachers and parents in providing students with the necessary learning opportunities. This pandemic demonstrates that educators, parents, students, and other stakeholders must work harder to attain a specific educational goal. Covid-19 demonstrates that there are human constraints over which we have no control.

Recommendations

The institution's (NEUST) instructors may design modules that are stimulating and engaging to study, such as comics and other graphical materials. They may undertake action research on modules and other blended learning modalities to ensure a continuous evaluation process and to offer various teaching methodologies rather than pure modules. Instructors may focus not only on students' academic performance but also on their disposition toward mathematics learning. To reduce anxiety, the institution may perform psychological debriefing for professors and students. Teachers may provide additional interventions to reduce students' anxiety during this pandemic. Furthermore, teachers, parents, and other stakeholders should continue what they are doing to improve and supplement the necessary learning experiences for students amid a pandemic. Further research studies may conduct on this topic.

Limitation

The purpose of this study is to examine the strengths and weaknesses of modular learning and its impact on high school students' mathematics behavior and achievement. This was also intended to offer action for this specific school.

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