Students' Perceptions on Mathematics Assessment in Remote Learning

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Abstract

The emergence of the COVID-19 pandemic caused classes to move online. This study used a quantitative design that aims to assess students' perceptions in mathematics assessments based on their perceived level of Mathematics anxiety, preferred assessment, and academic honesty in remote learning while highlighting the differences in gender and sections through a constructed survey questionnaire. The 90 Grade 9 students in a private Catholic school in Manila sampled using a convenience sampling process were surveyed using the aforementioned questionnaire. Descriptive and inferential statistics were used for data analysis. Results revealed no significant difference in students' perceptions of mathematics assessments according to sections. The same effect was observed in their perceptions of reviews by gender, except for mathematics anxiety and neutral preference. The study suggests that teachers use suitable assessments targeting the needed learning competencies to better measure students' academic performance.

Keywords:

assessment, academic honesty, Math anxiety, perception.

Introduction

Background of the Study

Various heads of states and world leaders convened at the United Nations (U.N.) Headquarters in New York City to establish the 2030 Agenda for Sustainable Development. The agenda consisted of 17 sustainable development goals (SDGs). The 4th SDG is about "ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all" (United Nations, 2015, p. 21). As a member of the United Nations, the Philippines created the AmBisyon Natin 2040 in 2015 in hopes of Filipinos having a better quality of life. AmBisyon Natin 2040 is a glimpse of the planned future for the Philippines, which includes an agenda for education, making certain that Filipino students possess foundational literacies, competencies, and character qualities that will produce well-educated and innovative Filipinos (National Economic and Development Authority, 2016). One of the foundational literacies is numeracy, while some competencies are critical thinking and problem-solving, which are all under Mathematics education.

Mathematics education in the Philippines aims to help learners improve their critical thinking and problem-solving skills (DepEd, 2016, as cited in Balagtas et al., 2019). According to Ruiz, former Assistant Secretary for Programs and Projects of the Department of Education, success in mathematics education in the Philippines can be attained if this formula is followed "QME = SNGS + GC + WTT + POS," where QME stands for Quality Mathematics Education; SNGS is for Strong National Government Support; GC means Good Curriculum; WTT represents Well-Trained Teachers, and POS is an acronym for Private Organization Support (Guevarra, 2018, p. 13). This, together with the aforementioned, influenced the current study's researchers to investigate students' perceptions of Mathematics assessment in remote

learning, which may achieve the collective goal of Mathematics education in the Philippines.

In March 2020, the Philippine government imposed a mandatory Enhanced Community Quarantine (ECQ) due to the COVID-19 pandemic that restricted movements within the population. As this happened, academic institutions were forced to shift to a virtual mode of teaching and learning. Against this background, the researchers thought about some issues that might arise from them. Conducting classes virtually would mean that assessments will also be administered online without much supervision from teachers. Assessments given in schools are formative and summative. Formative assessments help teachers understand how the students grasp the lessons while they are still being taught, while summative assessments allow teachers to gauge how much students learned after the discussions (Moloi & Kanjee, 2018). Since evaluations are not proctored when administered remotely, the risk of academic dishonesty may affect how students' mastery and understanding of the lessons are reflected in their grades. The researchers of this study believe that students' grades should reflect their true mastery and sense of the lessons. In the online modality, it was observed that some students who performed well during face-to-face classes suddenly performed poorly in the virtual mode and vice versa. The possibility of academic dishonesty and Math anxiety among students were considered as some of the reasons why this may have been so.

Tootoonchi (2016) claims that "Mathematics is a subject in which students often report negative attitudes, high anxiety, and exhibit low levels of achievement" (p. 3). Considering such, teaching it online with the restrictions brought about by online classrooms was deemed to result to difficulty of students and teachers in coping with this new normal. As educational institutions were practicing "distance education, online teaching, remote learning, blended learning, and mobile learning," which are "collectively called emergency remote education (ERE)" (Rotas & Cahapay, 2020, p. 147), learners all over the country experienced challenges with the remote learning set up. Their study also showed 12 salient problems that Filipino students faced wherein "unstable internet connectivity; inadequate learning resources; electric power interruptions; vague learning contents; overloaded lesson activities; limited teacher scaffolds; poor peer communication; conflict with home responsibilities; poor learning environment; related financial problems; physical health compromises; and mental health struggles" were experienced by the students (p. 8). Teachers in the Philippines were also greatly affected by the shift to emergency remote education. Even if they seem to be "mentally prepared to adapt to new and innovative ways of imparting knowledge" during the switch to the virtual mode of teaching, it was also concluded that teachers were "hampered due to lack of facilities, equipment, and capacity building to distance learning education" (Alea et al., 2020, p. 141).

In totality, the pandemic raised challenges, problems, and questions regarding the educational system, requiring solutions and answers. Hence, the paper aims to observe and answer a fraction of these questions, particularly on students' perceptions of Mathematics assessment in remote learning, focusing on their level of anxiety, preferred judgement, and academic honesty as ascertained by gender and sections.

Students' Perceptions in Mathematics Assessment

The study by Hagan et al. (2020) recommended that teachers sustain students' positive perceptions of mathematics. According to Subia et al. (2018), students' attitudes have a deep relationship with their performances in mathematics. Applying these to the current study, teachers must positively ensure their students perceive assessment since their perception influences their performance. In fact, students' performance in mathematics is affected by their attitude toward the subject which supports the results of the study of Mazana et al. (2019) that students liked mathematics because they enjoyed the course and were confident and motivated to take it. Considering these, the current study's researchers investigated students' perceptions of their assessment preference (graded, ungraded, and neither of the two).

The study of Van Dinther et al. (2014) showed that perceptions of students regarding their formative assessments predict their self-efficacy and that perceptions of reviews indirectly affect the competence evaluation outcomes of students through their self-efficacy. Vaessen et al., in their 2017 study, shed

light on various assessment perception themes. They stated that students perceive assessments in multiple ways depending on their previous experiences, which has varied effects on them. Moreover, reviews may influence the students' state of mind, especially their motivation and self-efficacy. Their study found that higher grades in frequent assessments were related to higher perceptions of the value of regular evaluations.

In the study of Brown and Wang (2013), assessments were frequently linked to negative emotions. The respondents in the study drew images concerning evaluation. The photos showed the evaluative and controlling role assessment plays in their lives. Their study also showed that assessment is linked to life-changing negative repercussions because of failure. Teachers can address the negative perception of students by adding appropriate activities to the learning plan. Additionally, Hagan et al. (2020) recommended the implementation of cooperative learning to develop student interest and diminish students' negative perceptions. Collaborative learning gives students a positive attitude towards assessment, enabling them to enjoy learning with their peers.

According to Aarnos and Perkkila (2012), "mathematics anxiety refers to an individual's negative affect when engaging in numerical and mathematical tasks'' (p. 1495). Bofah and Hannula (2015) posit that emotions such as curiosity, frustration, and anxiety are important factors that affect students' performance, especially problem-solving skills. As observed in academic communities, math anxiety happens to numerous students worldwide. The study of Radisic et al. (2015), which was conducted to find out the correlation of math anxiety through school-level and individual-level factors, stated the differences between various groups and concluded that the 2003 PISA shows high levels of mathematics anxiety among students in Serbia even describing Mathematics as "lion hunting a sleeping gazelle," (Latterell &Wilson, 2016).

The study by Ewing and Cooper (2021) showed how assessments were done in remote learning and its corresponding issues. A teacher who participated in the survey mentioned that they could not assess formally in the context of remote education, and there is no guarantee that the results were a hundred percent accurate. It also showed how assessments in remote learning may not completely test the student's understanding of the concepts and that honesty is important in distance learning. As defined by Napa Valley College on its official website, practicing academic honesty is to possess "integrity, honor, and respect in all endeavors, both personally and professionally. In the current study, intellectual honesty is also a factor to be investigated to see whether there is a change in the level of academic honesty among students in the virtual learning mode. Besides emotions and honesty, another factor taken into consideration in this study is gender difference. Moreover, the researchers aim to determine how students' grades reflect their degree of understanding and mastery in online classrooms. Additionally, the researchers will investigate whether assessments still hold the same efficiency in measuring students' academic performance.

Mathematics Assessment in Remote Teaching and Learning

Cooper et al. (2022) revealed that the shift to remote learning resulted in renewed attention to formative assessments and a switch to authentic learning assessments because of concerns regarding academic dishonesty. Their study also found that remote learning catapulted issues regarding equity in education. Fitzmaurice and Ní Fhloinn (2021) surveyed several teaching staff in 29 different countries and found that formative and summative assessments employed by the participants in their respective classes were broader and wider in range. The study also revealed that participants felt a difference in grade distribution compared to the previous years; some of the reasons were cheating and easier and unsupervised assessments. There was a concern regarding online reviews particularly about the loss of integrity and the need for assessment changes (Ní Fhloinn & Fitzmaurice, 2022). Guangul et al. (2020) suggested, based on the results of their study, that one way to counter academic dishonesty was for teachers to create multiple assessments with unique questions for each student. Although, this is only ideal for classes with a small number of learners, as also mentioned in their study.

Byrne et al. (2021) found that instructors who participated in their study replicated the assessments used in regular face-to-face classes to remote learning. The same participants also prioritized individual review over group or class-based activities. The study

also indicated ways to improve assessment in an online course; one is through student feedback, and the other is by comparing one's evaluation to another instructor's assessment. In concordance with the previous study, most Slade et al. (2022) participants revealed they did not significantly revise their assessments when classes shifted online. Nonetheless, it is important to note that reviews used in face-to-face classes may not be as effective when used in remote learning; teachers should ensure that the assessments they give their students are fit and appropriate to the learning modality implemented.

Remote learning changed how assessments are administered; from the traditional pen and paper, it shifted to electronic gadgets. Aspiranti et al. (2020) conducted a study investigating students' preferred modes of assessment. The participants of the survey all preferred the pen-and-paper modality compared to the iPad-Keyboard modality; three out of the four participants also had a higher fluency when the pen-and-paper modality was used. The study was further extended by adding a new modality, the iPad-Stylus Pen. Like the previous results, the pen and paper modality achieved higher fluency than the other modalities; all participants preferred the pen and paper modality. The study by Reju and Jita (2020) also showed that students preferred the traditional way of taking assessments because they believe that the online modality of taking assessments does not provide them the immediate feedback they need to monitor their progress. Lukumon and Maharaj (2022) found that most students enjoyed online reviews; reasons for this range from less pressure, safety concerns, and comfortability, while others who did not want online assessments presented connectivity issues and distractions at home as reasons.

The idea of remote learning is not new to Filipino educators, parents, and students, but it has never been the norm or the preferred learning modality. Even so, Dahal et al. (2022) state that different and varied ICT technologies can promote pedagogy, learning, and learner empowerment in mathematics teaching and learning. The sudden change in conducting classes worldwide created a wide gap in knowledge and research. It also brought several issues and concerns never encountered before. One of the concerns experienced by teachers in remote learning was their internet connectivity (Poultsakis et al., 2021); this concern was not previously seen as a challenge by teachers in the traditional face-to-face teaching and learning modality. Taylor et al. (2022) found that during the lockdown in England, there was unequal access to mathematics learning, and students who belonged to the disadvantaged and low-attaining groups were negatively affected. Similarly, the 2022 cross-sectional study of Schult et al. discovered that incoming fifth graders in Baden-Württemberg, Germany scored slightly lower in Mathematics than in previous academic years. The shift to remote learning also brought about issues centered on assessment. The change in learning modality affected the appropriateness, effectiveness, and students' perceptions of the quality of reviews in an online class. The current study is significant in addressing the gap in assessment, especially regarding students' perceptions. It will help administrators and educators create and administer assessments appropriate for online learning.

Purposes of the Research

This study aimed to assess the students' perceptions of Mathematics assessment in remote learning. Specifically, this study attempted to answer the following questions:

1. What are the students' perceptions of Mathematics assessment based on the following:

    a. level of math anxiety.
    b. preferred assessment:
        i. graded,
        ii. non-graded,
        iii. neutral; and
    c. academic honesty in the context of remote learning?

2. Are there significant differences in students' perceptions of different sections in terms of:

    a. level of math anxiety.
    b. preferred assessment:
        i. graded,
        ii. non-graded,
        iii. neutral; and
    c. academic honesty in the context of remote learning?

3. Are there significant differences in students' perceptions between genders in terms of:

    a. level of math anxiety.
    b. preferred assessment:
        i. graded,
        ii. non-graded,
        iii. neutral; and
    c. academic honesty in the context of remote learning?

Conceptual Framework of the Study

The scaffold of the current study is built on concepts and research paradigms that led to a potent understanding regarding the significance of students' perceptions of Mathematics assessment in remote learning.

Figure 1 presents the conceptual diagram of the study; it shows students' perceptions of mathematics assessment. It can be deduced from the schematic diagram of the study framework that the arrows directly relate to the following: level of Math anxiety, preferred judgment, and academic honesty in remote learning. Students' perceptions and intellectual honesty regarding gender and sections in the context of remote education are also directed above.

Theoretical Framework

The researchers intend to assess the students' perceptions of Mathematics assessment in remote learning. In this study, APOS Theory stands for Action, Process, Object, and Schema, which Ed Dubinsky proposed. It starts with base objects where an individual carries out actions, interrelates into processes, and in turn, represented through symbols that possess meanings as mental objects, within the bounds of a wider schema. The move transforms things an individual perceives as necessarily external and needs a detailed procedure to act either directly or through recollection. The theory deems the idea of meaningful understanding, including all mathematical concepts, representable in terms of actions, processes, objects, and schemas (Daud et al., 2020).

Methodology

Research Design

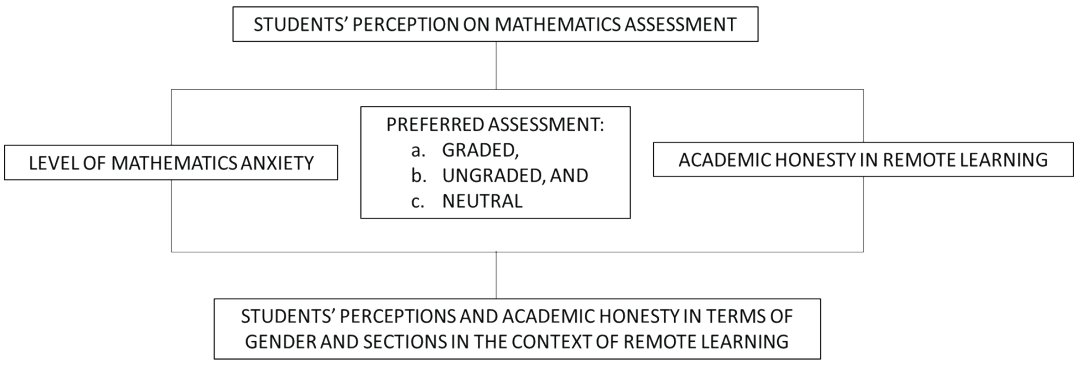
The research utilized a non-experimental quantitative design, particularly the cross-sectional descriptive design through a survey, to describe students' perceptions of their level of math anxiety, preferred assessment, and academic honesty when taking examinations in the identified subject.

Research Locale and Respondents

Most of their students are Filipino-Chinese, whose families' social class belongs to the upper or middle-income class. The school has a good standing in terms of Mathematics performance. There are 178 grade 9 students clustered into four sections according to the order of their surnames and gender. Each unit generally has the same number of male and female students. The size of each area ranges from 43 to 45 students. Among the 178 students, there were 90 respondents sampled through convenience sampling process.

Figure 1

Framework of the Study



Research Instrument

The researchers constructed a survey questionnaire. It contains two major parts: students' profiles and a 20-item survey questionnaire. The 20 items were classified into three categories—math anxiety (3 items), preferred assessment (10 items), and academic honesty (7 items). The study used a 5-point Likert Scale to rate each statement. A rating of 1 was considered the lowest with a remark of "strongly disagree," 2 for "agree," 3 for "uncertain or not applicable," 4 for "agree," and 5 being the highest rating for "strongly agree." For reliability, the researchers used SPSS to compute Cronbach's Alpha greater than .7, which means the questionnaire is internally consistent. For content validity, the significant value obtained through SPSS was Sig. (two-tailed) < .001. Therefore, the survey tool is valid and reliable.

Data Gathering Procedure

Before conducting the survey, the researchers asked permission from the school administrators, and parental consent forms were also distributed to the students to seek approval from their parents/guardians. The researchers were permitted by the school administrators during the third week of January 2021 and conducted this study from the fourth week of January up to the first week of February 2021. During the data collection, the researchers explained the objectives and shortly introduced the survey questionnaire to all participants separately by section through Google Meet. The questionnaire was administered using a Google Form.

Data Analysis

The statistical techniques used were both descriptive and inferential statistics. For initial data analysis, the researchers used descriptive statistical instruments to answer the first research question. The average mean for each statement was calculated through tallying and basic operations. The statements were clustered by similar categories together. Three reports were huddled under the category of Math anxiety, four statements about preference on graded assessment, another four accounts classified to preference on non-graded review, two views fell under choice on neutrality, and seven accounts were allotted to the academic honesty category. The researchers computed the mean score for each category, such as the total mean score of math anxiety; the same process was employed for the rest, varying only on the divisor, which is dependent on the number of statements in each category. As a result, each total average mean score would fall into a certain range in which the researchers assigned a particular description for each content. The results from the computed total average mean scores are interpreted as follows: less than 0.99 means "very low" degree of agreement toward the statement; 1.0-1.99 means "low" degree of agreement towards the statement which they rated; 2.0-2.99 means "moderate" degree; 3.0-3.99 would be "high" degree; and lastly, 4.0-4.99 is determined as "very high" degree of agreement. After computing the three major categories' total mean scores paired with its description, the first research question was answered.

The researchers applied inferential statistics, particularly One-Way ANOVA, to find the significance of students' perceptions of math anxiety, preferred assessment, and academic honesty between genders and sections, which answers the second and third research questions. The result was computed through Excel.

Results and Discussion

Students' Perceptions on Mathematics Assessment

Table 1 shows the result of the total mean scores and standard deviations for the different categories. Under the math anxiety category, there were three survey statements, and its computed average mean was 3.80, which falls on the scale of high degree. Students still had a high degree of perceived math anxiety though classes shifted to remote learning. This result also means that the modality of the class would not affect students' math anxiety much. In other words, the main cause of students' math anxiety may be internal factors within students, but not their teachers, environments, and others. Several studies have found that math anxiety is negatively related to student performance (Foley et al., 2017; Grežo & Sarmány-Schuller, 2018; Henschel & Roick, 2017; Mutlu, 2019; Núñez-Peña & Bono, 2019; Passolunghi et al., 2019; Schillinger et al., 2018; Orbach et al., 2020); hence, the researchers believe that considering students' level of math anxiety on assessments is important as it may affect their performance in the subject.

Table 1

Respondents' Level of Agreement on their Perceptions on Assessment toward Mathematics

Type	*M*	*SD*
Math Anxiety	3.80	1.13
Preference of assessment		
Graded Assessment	3.53	1.02
Non-graded Assessment	3.49	1.00
Neutral	2.84	1.22
Academic Honesty	2.62	1.13

There are 10 survey statements under the category of preference on assessment in mathematics. Four statements are under the graded evaluation preference, and another four are under the preference of non-graded assessment. The computed mean for graded assessment is 3.53, which falls on the scale of high degree. This result means that many students, even with math anxiety, still prefer graded assessments. They seem to have a common belief that they can check if they absorbed and understood the subject matter well through graded examinations. For those students who preferred non-graded assessments, the computed mean is 3.49, slightly lower than graded assessments, although it also falls on the high degree scale. The students might experience a certain degree of pressure and stress, and they believed that non-graded reviews might give them more confidence and relaxation when dealing with mathematics. The last two statements are about neutrality; the computed mean is 2.84, which falls on the moderate degree. This result means that some students would not be affected by the type of assessments. These results can help teachers plan and select what kind of assessment is suitable for their students in an online class setting. As Krijgsman et al. (2017) suggested, teachers need to create proper checks to reduce students' pressure and feeling of failure and to strengthen their performance to stimulate students' positive motivational and affective experiences.

The academic honesty domain includes seven statements on the survey. Generally, the computed mean is 2.62, which falls on a moderate degree. This result means that students showed moderate academic honesty toward mathematics assessment. However, when researchers split the detailed survey questions, they discovered that students showed high honesty in accomplishing non-graded assessments on their own. In contrast, students showed moderate academic honesty in terms of searching for correct answers from the internet or getting answers from their peers during major mathematics exams. Furthermore, students expressed a low level of agreement that their math grades can reflect their real understanding of the subject matter, which means most students believe rates do not equal their real mathematical ability.

In general, graded assessment decreases the degree of academic honesty in mathematics, while ungraded assessment does the opposite. The latter means that graded examinations pressure students and incline them to cheat during the exam. As David (2015) stated, academic dishonesty is one of the most blamed and frequent phenomena occurring in students in higher education due to negative self-esteem and low level of mastery. Furthermore, the study by O'Leary et al. (2017) claims that students with the highest anxiety level would get the lowest grades due to their negative feelings toward math. Some other reasons for academic dishonesty are students' fear of failure, the temptation of online searching, common math beliefs, and a poor environment for learning. Similarly, Korn and Davidovitch (2016) found that students with a more negative attitude toward the subject have a greater potential to show high academic dishonesty and vice versa. In concordance with the previous statements, the study of Brown et al. (2019) showed that there is a certain degree of prevalence of academic dishonesty in higher education.

Students' Perceptions of Assessment by Gender

Based on Table 2, the p-value of Math anxiety and the category of neutral are .04 and .007, respectively, which is less than the confidence level (α=.05) for this study. This result means there is a significant difference between male and female students in terms of math anxiety and neutral preference toward assessment in mathematics. Additionally, the p-values of graded assessment, non-graded assessment, and academic honesty are .93, .33, and .85, respectively, which are higher than the confidence level, indicating that there is not enough evidence to show that there exists a significant difference in students' perceptions between males and females in terms of graded and non-graded assessments, and level of academic honesty in remote learning modality. Bieg et al. (2015) found that there is a difference between gender concerning Math anxiety. The difference manifested significantly in females compared to males (Hill et al., 2016; Luttenberger et

Table 2

One-Way Analysis of Variance Result of Students' Perceptions on Assessment by Gender

Source	*df*	*SS*	*MS*	*F*	*P-value*	*F crit*
		Between genders				
Math Anxiety	1	3.94	3.94	4.34	.04	3.95
Preference of Assessment						
Graded Assessment	1	.004	.004	.008	.93	3.95
Non-graded Assessment	1	.51	.51	.96	.33	3.95
No Preference/Neutral	1	7.12	7.12	7.59	.007	3.95
Academic Honesty	1	.009	.009	.03	.85	3.95
		Within gender				
Math Anxiety	88	79.80	.91			
Preference of assessment						
Graded Assessment	88	47.60	.54			
Non-graded Assessment	88	47.71	.54			
No Preference/Neutral	88	82.54	.94			
Academic Honesty	88	23.75	.27			

Table 3

One-Way Analysis of Variance Result of Students' Perceptions of Assessment by Section

Source	*df*	*SS*	*MS*	*F*	*P-value*	*F crit*
		Between sections				
Math Anxiety	3	3.67	1.22	1.31	.28	2.71
Preference of Assessment						
Graded Assessment	3	.62	.21	.38	.77	2.71
Non-graded Assessment	3	1.42	.47	.88	.45	2.71
No Preference/Neutral	3	3.47	1.16	1.16	.33	2.71
Academic Honesty	3	1.76	.59	2.29	.08	2.71
		Within sections				
Math Anxiety	86	80.06	.93			
Preference of Assessment						
Graded Assessment	86	47.00	.55			
Non-graded Assessment	86	46.26	.54			
No Preference/Neutral	86	86.18	1.00			
Academic Honesty	86	22.00	.26			

al., 2018; Primi et al., 2014; Rodríguez et al., 2020). According to Sokolowski et al. (2019), males are more advantageous in possessing attributes of spatial cognitive thinking skills than females; for this reason, more females have anxiety in areas related to numbers which leads STEM strands to be dominated by males. It means no matter what learning modality is used, math anxiety exists among students.

Students' Perceptions of Assessment by Section

Table 3 shows the variance result of students' perceptions of assessment between sections and within sections. Based on Table 3, the p-values of math anxiety, graded assessment, non-graded assessment, neutral, and academic honesty are .28, .77, .45, .33, and

.08, respectively. All these p-values are greater than the confidence level (α=.05), which means there is not enough evidence to show the difference in students' perceptions of assessment among the four sections in terms of math anxiety, assessment preference, and academic honesty. In other words, students' perception is similar no matter what section they have been assigned. The possible reasons could be that students may have similar backgrounds, concepts, and perceptions since they all came from a private school, and their socioeconomic status belonged to the middle class and above. According to Bachore (2016), some of the causes of dishonesty were the exam's difficulty, time, peer pressure, and grades, but not by different clusters.

Conclusion

The study's main objective is to assess students' perceptions of Mathematics assessment based on the level of Math anxiety, preferred judgement, and academic honesty in remote learning. It also investigated significant differences in students' perceptions between genders and sections under these three major categories in the context of distant learning. The study is essential to ensure that assessments given in online learning correctly measure the desired learning competencies and, in turn, develop mathematically proficient students, critical thinkers, and problem solvers.

Based on the results, it can be deduced that math anxiety is still prevalent among students. Math anxiety is still present in students, even in the context of remote learning. For the preferred assessment, students who preferred graded assessment seem to have a shared belief that they can gauge their understanding of Mathematics through graded evaluations. On the other hand, students who chose non-graded reviews may have experienced a certain degree of pressure and stress from Mathematics, and ungraded assessments give them more confidence and lessen their fear of committing mistakes. Students who preferred to be neutral in their choice of evaluation emphasized that they were not affected by the type of assessment they received from their teacher. It can be deduced that an assessment, whether it may be graded or not, is still an assessment and is essential in their academic journey. For the overall aspect of intellectual honesty, students showed moderate academic honesty toward Mathematics assessment. The study also found that students showed a relatively high degree of openness in accomplishing ungraded assessments compared to graded examinations. The degree of academic honesty shown by the students is alarming as education is not solely about molding bright and smart students but rather forming a holistic person who embodies good values and virtues.

The other results of this study show no substantial evidence to the difference in students' perceptions toward assessment among the four sections regarding math anxiety, assessment preference, and academic honesty. The results also show insufficient evidence to show a significant difference between male and female students' perceptions of graded or ungraded assessments and the level of academic honesty in virtual classes. The result can be caused by the fact that the students share a similar background, including their mathematical capabilities and socioeconomic status.

The researchers recommend educators to give suitable assessments to students during online classes. Since students lack interactions with their peers, teachers may give them more opportunities to chat, talk, play, and work together. Similarly, these interactions can relieve students' anxiety caused by the sudden educational system change. The current study's researchers suggest that teachers should also consider students' emotions and involve certain activities that allow students to actively engage and enjoy class, even during online courses. Designing mixed teaching techniques that will support mathematics teaching through ICT is essential (Papadakis et al., 2016). Adaptive e-learning is suggested. According to the research of Katsaris & Vidakis (2021), numerous studies support the effectiveness of adaptive e-learning systems using students' learning styles as it is more in line with learners' preferences, needs, and general learning styles. More and more platforms and apps are using adaptive e-learning because of the utilization of new technologies and smart devices. The study by Papadakis et al. (2017) suggests teaching realistic mathematics is effective. By placing the subject in real-world situations, mobile technologies in mathematics education can increase students' interest and participation in mathematics (Papadakis et al., 2021). Through these, students may have lower levels of Math anxiety and stress, hopefully leading to a higher level of academic honesty in remote learning.

One limitation of the study is how math anxiety was recorded. The study only documented math anxiety based on students' perceptions of their math anxiety levels. Math anxiety was recorded and reported in the study based solely on students' perceptions. Another limitation is the respondents; all participants were junior high school students. The study is only limited to students in junior high school. The results of studies where respondents come from different educational levels (pre-school, elementary, or tertiary) might differ.

For further studies with the same topic, the researchers recommend future researchers conduct a comparative analysis between students from various educational levels (pre-school, elementary, high school, and tertiary) to see whether math anxiety, preferred assessment, and academic honesty in remote learning differs depending on the educational level of the participants. Another recommendation for future researchers is to compare students in traditional face-to-face classes and online classes in terms of their math anxiety, preferred assessment, and academic honesty. The present study's math anxiety was based only on students' perceptions; future studies could gather the actual levels of math anxiety. It is interesting to see whether the perceived level of math anxiety is the same as the actual level of math anxiety. Lastly, the researchers recommend doing a longitudinal study to see whether math anxiety, preferred assessment, and academic honesty in remote learning change over time. It can discover whether students' perceptions change during the initial switch to online learning and when they have already adapted and adjusted to the learning modality.

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