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Technology in the Teaching of Mathematics: An Analysis of Teachers' Attitudes during the COVID-19 Pandemic

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Abstract

One of the most significant events of the 21st century is the birth of modern technologies, specifically the development of electronic digital computers. Much more with the emergence of the new normal education, this technology's impact on science and business is very rampant. It is already affecting the educational enterprise in significant ways. Thus, the researcher conducted a study on teachers' attitudes toward using technology in mathematics teaching the COVID-19 pandemic. The researcher used the descriptive methodology utilizing the adopted Mathematics and Technology Attitude Scale administered to the randomly selected participants to address this problem. The study results show that the attitudes of the mathematics teachers toward using technology in terms of behavioral engagement and confidence with technology are positive while strongly positive in terms of affective engagement. Results also indicate that male and female teachers differ significantly in their attitudes toward using technology in mathematics teaching. Males exhibit better attitudes than females. Along this line, it can be deduced that the use of technology in mathematics teaching bears relevance and significance to the mathematics teachers because they develop positive attitudes toward it. The study suggests that the Department of Education should undertake programs to enhance mathematics teachers' competencies and attitudes in using technology, considering the new modality of learning. Likewise, it is suggested that mathematics teachers should develop and strengthen a positive attitude towards learning and teaching with technology.

Introduction

Since January 2020, the world has experienced problems and challenges brought about by the COVID-19 pandemic. This crisis has ravaged the world and put people around the globe in chaos. This pandemic has curtailed lives, put the economy entirely down, and severely affected different aspects of living. Gopinath (2020) expressed that a rare disaster, a COVID-19 pandemic, has resulted in a tragically large number of human lives being lost. As countries implement necessary quarantines and social distancing practices to contain the pandemic, the world has been put in a Great Lockdown. The magnitude and speed of collapse in the activity that has followed is unlike anything experienced in our lifetimes. On the other hand, Shearing (2020) uttered that different countries would need different responses to dealing with the global economic challenge. This scenario is obvious indeed that the outbreak of the COVID-19 has put the world in a panic.

COVID-19 has also seriously disrupted the educational momentum of many countries. The emerging threat of COVID-19 outbreak resulted in the closing of elementary schools, and within a short span of weeks in March of 2020, most major universities and colleges. Students were given a few short days to move off-campus in many cases and were informed within two weeks. The remaining of their 2020 semester would be moved to Distance Learning (online format) with no more in-person classes held (Unger & Meiran, 2020). In the Philippines, the Department of Education (DepEd) and the State Colleges and Universities (SUCs) are still adamant about the most suitable delivery mode to make students learn. Smart initiatives are being undertaken amidst fear of contamination due to the continuing spread of the virus. Different modalities like the modular approach, online learning, and blended learning were discussed, but schools are not so certain yet as to the best mode to be employed to make learning accessible to the learners at all levels nationwide.

Since most learning modalities require the use of technology, the researcher put importance on teachers' attitudes toward the use of technology in teaching mathematics. As pointed out by Kenemy (1984), it is important to note that mathematics serves the interest of all fields of endeavor. Mathematics can attribute its

importance in the modern world to the growth and production of different occurrences in life. However, the majority of students across the globe dislike mathematics. Scarpello (2007) reports that seventy-five percent of Americans stop studying mathematics and stay away from many careers related to mathematics. He identifies mathematics anxiety as one of the main reasons for this. With the advent of technology and its proliferation in business and industries, but likewise in school, it made school-related tasks easier. Its presence has also made teaching and learning of mathematics more meaningful, especially in this time of the COVID-19 pandemic. Festus et al. (2013) claimed that teachers are supposed to be the best minds of any country in response to the ongoing global reforms in society's educational and technological growth. Mathematics should be the fundamental tool to achieve this national aim.

Along this line, Galbraith and Haines (1998) argued that the spectrum of pedagogies associated with its use is expected to expand as technology has been gradually imported into educational settings. The effect of inherited teaching practices on the adoption of technology has been recognized by Ramsden (1997). The demands and challenges of the new normal education changed the educational landscape in the Philippines, but across the globe, by referring to an urge for teachers to start by looking for electronic ways to do familiar jobs previously done by textbooks and lectures, particularly in this COVID-19 pandemic. The need to establish expertise in the use of teaching and learning technology is a must. In this regard, Thorpe (1998) expressed that technology was ultimately used to develop preferred teaching methods to analyze teaching habits and attitudes towards technology. That is to say; the technology was conservatively used.

Teachers' attitudes - not only towards mathematics but also towards mathematics teaching, there is a significant relationship between teachers' attitudes towards teaching mathematics and their practice in teaching mathematics. As a result, they have a powerful influence on the students' attitudes towards mathematics (Ernest, 2004). In a study of Anyagh, Hanmane, and Abah (2018) on secondary school students' perceptions of teachers' attitudes towards learning mathematics. It was revealed that teachers had displayed a negative attitude towards their students in the learning of mathematics. This result implied that the teacher's actions and inactions highly influence students' mathematics learning and attitude towards it. This is also a reflection from Ampadu (2012), stating that despite the importance of the different but interrelated factors on learning mathematics, the core of the interplay between the learner and what is learned is accredited to the teachers. Many types of research also contend that teachers' attitudes toward using technology in the teaching of mathematics influence how students engrossed themselves in learning the subject.

According to Kenneth (1996) and Rosas (2003), there is evidence of a connection between computer-supported leisure activities, positive attitudes towards mathematics, progress in mathematical learning, and student success through technology in teaching. Likewise, Jonanssen (2000) argues that technology can be used to facilitate the deep analytical thinking required for effective learning. Brandt (1997) also argues that computers can be used as new technical support to visualize abstract concepts through virtual representations created by computers, enabling the creation of conceptual mental models. Thus, in the mathematics classroom, researchers were interested in studying teachers' attitudes towards computer use. The Technology Acceptance Model proposed by Rahman, Ghazali, and Ismail (2003) indicated that the attitude towards using computer technology had a positive connection with the purpose and, ultimately, actual use of computers in the classroom environment. Sa'ari, Luan & Roslan (2005) argued that if teachers have a positive mindset, it can impact computers' future use in the classroom and help build trust. It also leads to the improvement of self-efficacy.

According to Usun (2004), computers that are considered to be the most powerful interactive platform and the most powerful individual learning technology have penetrated educational systems and created new approaches to school systems and learning processes. Monaghan (2004) added that computer technology introduces new mathematics fields and takes new ways of thinking about mathematics with them. Using information technology effectively at mathematics education is a subject that is widely discussed (Cockcroft, 1982). In addition, López-Martio and López (2007) stated that the electronic learning environment focused on Interactive Instructors of Recreational Mathematics (IIRM) positively influences students' attitudes toward mathematics. Most of the students felt relaxed in the classroom using multi-user games coupled with an instant messaging method.

In this analysis, the researcher used the Mathematics and Technology Attitude Scale (MTAS) developed by Pierce, Stacey, and Barkatsas (2007) to analyze five affective variables related to technology-based learning mathematics. Mathematics Confidence (MC), Confidence with Technology (CT), Attitude to Learning with Technology Mathematics (ALMT), Affective Engagement (AE), and Behavioral Engagement (BE) are the five sub-scales. Pierce Stacey and Barkatsas (2007) found that faith in the use of technology, attitude to technology-based learning mathematics, and affective and behavioral interaction relate to the efficacy of learning processes. By using mathematical programming software to explore and improve their intellectual understanding, teachers

who have optimistic attitudes towards teaching using technology to teach mathematics to resolve initial difficulties.

In this pandemic, where learning mode is no longer face-to-face, teachers, especially mathematics teachers, need to be competent enough to use technology in the new modality of teaching and learning. In this regard, the researcher argues that a teacher should establish a positive attitude towards it to be competent enough in using technology in teaching. The OECD (2016) research on the usage of teaching and learning technology technologies may be a starting point for addressing the successful use of online tools in remote or distance learning. The famous study found that students did not inherently perform better, even with technological learning resources. The study pointed out how tech tools were not used efficiently because they were not educated in 21st-century pedagogy to adequately and meaningfully incorporate the tech tools. Teachers are not yet ready for online teaching in this respect. They were just forced to absorb the use of technology in this modern learning modality because of the situation they cannot do away with. With these study findings, schools should ensure that teachers do not simply pass or translate what they do into their online classroom within the classroom. Therefore, they are encouraged to be patient and aspire, particularly in an online classroom, to cultivate a positive attitude towards technology.

Teachers should change how they teach online in the new normal, especially as online tools and resources have numerous opportunities that teachers and students can take advantage of. To make the learning process a personal experience for every student, teachers can curate the best online learning tools about their topics and create learning playlists or menus. Instead of being a master curator of tools that encourage engagement and deeper learning, teachers should avoid being a content dumper. Besides, teachers can plan successful synchronous and asynchronous learning exercises that allow for sustained involvement, self-regulation, speech, and students' option. To do this, educators should still note that the use of technology should be guided by sound pedagogy and not the other way around. Stop jumping into a railcar. Instead, begin first with a strong understanding of the 21st-century pedagogy, which needs a positive teaching attitude.

Many studies have established about attitudes toward mathematics of both teachers and learners. But rarely were conducted studies on teachers' attitudes toward using technology in teaching mathematics, especially in this COVID-19 pandemic. Thus, this study was conducted.

Statement of the Problem

This study aimed to determine teachers' attitudes toward the use of technology in the teaching of mathematics. Specifically, this study aimed to determine: (1) teachers' attitudes toward the use of technology in the teaching of mathematics when grouped according to the selected variables and (2) significant differences in teachers' attitudes toward the use of technology in the teaching mathematics when grouped according to the selected variables.

Method

Research Design

This study utilized the descriptive method of research. Descriptive method because the researcher wanted to determine and describe mathematics teachers' attitudes toward using technology in teaching mathematics. Likewise, the researcher wanted to describe and compare the significant difference among mathematics teachers' attitudes toward using technology in teaching mathematics when grouped according to their profile variables. According to Gall and Borg (2007), descriptive research aims to describe a phenomenon and its characteristics. This research is more concerned with what rather than how or why something has happened. Therefore, in this study survey tools are used to gather data. Thus, the researcher believes that this method of research is the most appropriate.

Research Participants

The research participants of the study were the 98 public school teachers in Cadiz City. The researcher considered the population as participants since their number is manageable. The research participants were

grouped according to their profile variables, such as sex and grade level taught. Presented in Table 1 is the profile of the participants when grouped according to their profile variables.

Table 1 shows that 32 or 32.6% of the participants were males, while 66 or 67.4% were females. The data reflects that majority of the public school teachers as participants were females. This is a fact that most teachers are female, as females are more attracted to the teaching profession. Marpa and Trinidad (2018), on their study on the changing perspective of teaching as a profession, revealed that teaching is female-dominated even nowadays. Although an increase of those interested in this profession citing reason as teaching as a profession is a stable job, the fact remains that it is still female-dominated.

Table 1. Profile of the Participants

Profile Variables	*f*	%
Sex		
Male	32	32.6
Female	66	67.4
Total	98	100.0
Grade Level Taught		
Primary	23	23.5
Intermediate	30	30.6
Junior High School	45	45.9
Total	98	100.0

Research Instrument

The research instrument utilized in this study was a Mathematics and Technology Attitude Scale (MTAS) developed by Pierce, Stacey, and Barkatsas (2007), which monitors five affective variables, namely: mathematics confidence, confidence with technology, attitude to learning mathematics with technology, behavioral, and affective engagement. This is originally developed for middle secondary years students but was modified to suit the math teachers as participants. This is a 20-item test with five items equally distributed to five affective variables mentioned with five options for the participants to choose. The options are strongly agreed, agree, uncertain, disagree, and strongly disagree.

Since the research instrument was modified to suit math teachers' attitudes, the research decided to establish its validity and reliability. In establishing the research instrument's validity, the researcher adopted the criteria developed for the evaluation survey questionnaire set forth by Carter V. Good and Douglas V. Scates. Five jurors were asked to rate the research instrument's validity, resulting in a validity index of 4.65. This validity index indicates that the modified research instrument was valid to a very high degree.

On the other hand, to establish the reliability, the modified research instrument was pilot tested to public school teachers in the nearby cities that were not the study's actual participants. Using Cronbach Alpha to establish reliability, it was revealed that the alpha coefficient is 0.97. This coefficient of reliability shows the research instrument was reliable to a very high degree.

Data Analysis

To answer the problems posed in this study, the researcher employed frequency and percentage to answer the participant's profile problem. On the other hand, mean and standard deviation were used to answer problems on the attitude of mathematics teachers towards the use of technology in the teaching of mathematics while t-test and one-way analysis of variance was used to determine the significant difference in mathematics teachers' attitude towards the use of technology in teaching mathematics. The data were processed using the Statistical Package for Social Sciences (SPSS).

Results and Discussion

Results presented in Table 2 indicate that mathematics teachers are positive towards using technology in teaching mathematics *(M = 3.62, SD = 0.27)*. They believed that using technology in mathematics teaching, especially in this new normal education, is a wholesome approach to improving mathematics teaching and

learning. They also believed that students would be motivated to learn more and participate during class discussions and activities through technology. Likewise, mathematics teachers were also positive *(M = 3.58, SD = 0.63*) towards learning mathematics with technology. Furthermore, they believed that technology in the teaching of mathematics in this new normal education helps improve their confidence in the teaching of the subject *(M = 3.46, SD = 0.37)*. Moreover, they strongly believed that the use of technology in mathematics teaching helps boost their affective engagement.

Several studies explored the impact of technology along this line (Ng & Gunstone, 2002; Nugent, Soh, & Samal, 2006; Shyu, 2000) and concluded that technology could inspire students to learn mathematics and science. Students enjoyed the rich resources and the improved accessibility of information offered by the Internet while the Internet was being used in science classrooms. For instance, Ng and Gunston (2002) studied Australian students in grade 10 and found that they perceived four advantages and four disadvantages of the Web as a study tool. The benefits include: (1) unlimited data; (2) improved accessibility; (3) accessible, self-directed learning allowed; and (4) improved technical skills. The drawbacks were: (1) the difficulty of finding good information on the website; (2) time-consuming; (3) considerable assistance needed; and (4) technological glitches. In other words, using technology in mathematics classes has its disadvantages. Yes, it cannot be denied that using technology in teaching and learning, internet connectivity problems is always a problem. In an informal interview conducted by the researcher majority of the mathematics teachers quoted that "We always have problems with internet connectivity. Sometimes connectivity suddenly stops along the way of the online discussions. However, considering the situations where the COVID-pandemic is rampant, the only choice we have is to indulge in modular and online teaching. If this barrier to using technology in teaching will be addressed, we can say that mathematics teaching becomes easier.

Following the literature, as mentioned earlier and debate, Hoffner (2007) and O'Bannon and Puckkett (2007) claim that several educators support improving technical learning, while others are concerned about the effect of technology on teaching (Cummings, 1996; Drier, 2001). Pedretti and her colleagues (1998) argued that any new educational innovation needs to consider the effect of the changes that follow technology's application to all stakeholders. The voice of those most affected must be heard in a technology-enhanced classroom, where teaching and learning may be radically evolving. Nowadays, these announcements from the authorities are very important. The prospect of providing schools with excellent internet connectivity for the best online teaching and learning should be considered by government and non-government organizations.

Table 2. Mathematics Teachers' Attitude towards the Use of Technology in the Teaching of Mathematics

Sub-Scale	**M**	**SD**
Behavioral Engagement	3.37	0.69
Confidence with Technology	3.39	0.55
Mathematics Confidence	3.46	0.37
Affective Engagement	4.31	0.44
Attitude to Learning Mathematics with Technology	3.58	0.63
Overall Mean	**3.62**	**0.27**

Note. The mean scores are interpreted as follows: 1.00 – 1.80 (Strongly Negative); 1.81 – 2.60 (Negative); 2.61 – 3.40 (Uncertain); 3.41 – 4.20 (Positive); and 4..21 – 5.00 (Strongly Positive)

Table 3 reveals that male (M = 3.83, SD = 0.25) and female ((M = 3.57, SD = 0.25) mathematics teacher' attitudes toward the use of technology in the teaching of mathematics is positive. likewise, the same results were obtained when sub-scales were considered individually. Male mathematics teachers' attitudes toward using technology are positive except on affective engagement where male mathematics teachers' attitude was strongly positive (M = 4.43, SD = 0.48). On the other hand, female mathematics teachers' attitudes toward the use of technology in learning mathematics were uncertain except on affective engagement (M = 4.28, SD = 0.43) and attitude to learning mathematics with technology (M = 3.62, SD = 0.57)) were their attitudes were strongly positive and positive, respectively.

The results presented in this table reflect those male mathematics teachers have a better attitude towards using technology in teaching mathematics. This means that male teachers are more positive than female teachers in the use of technology in mathematics teaching. This is supported by Tanveer et al. (2011) in their study on the attitude of mathematics teachers related to computer technology use in the classroom. Their study revealed that male teachers are more positive than female teachers in the use of technology in mathematics teaching. This is also confirmed by Relich (1996), stating that there is considerable evidence that males are more positive in personal aptitude and attitude towards mathematics than females. Likewise, Lee and Anderson (2015) stated that

while studies focusing on gender differences in achievement are inconclusive, there is clearer evidence that positive attitudes, behaviors, and participation rates in mathematics generally favor boys.

Results have also shown that males have greater interpersonal involvement and trust in mathematics teaching than females. Since males are more interested in computer technology, as viewed (Fallows, 2005; Powell, Hunsinger, & Medlin, 2010; Minton and Schneider 1980; Venkatesh et al., 2003), it can be concluded that their interest and trust in mathematics teaching is better than females. Gender differential research shows that men appear to be more task-oriented than women (Minton and Schneider, 1980; Venkatesh et al., 2003). When using the Web for an analogous search mission, males performed significantly better than females, as Roy and Chi (2003) noted.

On the contrary, women are more mindful of others' feelings and are concerned with group unity, consensus, and interrelationships. Chat groups over newsgroups tend to favor women, indicating that women prefer a more social and synchronous experience (Jazwinski2001). For various purposes, males and females might thus be encouraged to embrace and use the Web. Therefore, it may be increasingly necessary for academics and website managers to provide more comprehensive web acceptance and use of target-related males.

Furthermore, in terms of mathematics confidence, it is clear from the results that males teachers have better mathematics confidence than females. Responses in this regard reflected that males have less worry about using technology in the teaching of mathematics. Likewise, they have expectations of getting good answers the way they are teaching mathematics using technology. Generally, they feel good about mathematics and teaching mathematics with technology. On the other hand, as commonly observed, females have some fears regarding the use of technology in their mathematics classrooms (Fear-Fenn & Kapostasy, 1992). Bandura (1986) contends that people fear events only when they cannot predict or control them.

Table 3. Male and Female Teachers Attitudes toward the Use of Technology in the Teaching Mathematics

Sub-Scale	Male		Female	
	M	*SD*	*M*	*SD*
Behavioral Engagement	3.77	0.75	3.25	0.64
Confidence with Technology	3.68	0.75	3.31	0.46
Mathematics Confidence	3.80	0.15	3.37	0.36
Affective Engagement	4.43	0.48	4.28	0.43
Attitude to Learning Mathematics with Technology	3.45	0.82	3.62	0.57
Overall Mean	**3.83**	**0.25**	**3.57**	**0.25**

Note. The mean scores are interpreted as follows: 1.00 – 1.80 (Strongly Negative); 1.81 – 2.60 (Negative); 2.61 – 3.40 (Uncertain); 3.41 – 4.20 (Positive); and 4..21 – 5.00 (Strongly Positive)

When grouped according to grade level taught, Table 4 reveals that the attitudes toward the use of technology in the teaching mathematics of the primary teachers *(M = 3.53, SD = 0.21)*, intermediate teachers *(M = 3.64, SD = 0.35)*, and junior high school teachers *(M = 3.69, SD = 0.22)* was positive. However, when sub-scales were considered, results show that primary and intermediate mathematics teachers were uncertain in almost all of the sub-scales except on the affective engagement and attitude to learning mathematics with technology where they are strongly positive and positive, respectively. In other words, teachers perceived that it's only natural to develop fears and anxieties in using technology in teaching mathematics. The fact is that it is quite new to them, especially for those who are teaching in the remote areas where the presence of technology is beyond reality, interest, and frustrations are elements to consider (Wells & Makar, 2014).

On the other hand, in almost all sub-scales, junior high school teachers' attitudes towards using technology in teaching mathematics are optimistic but strongly positive in terms of their affective involvement. They expect them to teach the subject using technology, considering that junior high school teachers have varying experiences of the grade level taught. Many kinds of research indicate that impacts on teacher experience can be noticeable over a longer time. Thus, junior high school teachers are better at utilizing and maintaining a positive attitude toward using technology in mathematics instruction. Murnane and Phillips (1981) reported that experience had a substantial positive impact on student achievement among teachers during their first seven teaching years. Ferguson (2010) shows that students taught by teachers with more than nine years of experience had substantially higher test scores at the high school level than students whose teachers had five to nine years of experience. It is clear from the study that teachers' experiences play a great role in developing the skills and attitudes of teachers towards teaching and learning for learners.

Table 4. Primary, Intermediate, and Junior High School Teachers Attitudes toward the Use of Technology in the Teaching Mathematics

Sub-Scale	Primary Level		Intermediate Level		Junior High School	
	M	*SD*	*M*	*SD*	*M*	*SD*
Behavioral Engagement	3.22	0.78	3.48	0.74	3.40	0.58
Confidence with Technology	3.08	0.41	3.27	0.49	3.76	0.51
Mathematics Confidence	3.40	0.25	3.36	0.44	3.61	0.37
Affective Engagement	4.15	0.34	4.36	0.55	4.40	0.39
Attitude to Learning Mathematics with Technology	3.78	0.59	3.73	0.68	3.28	0.53
Overall Mean	3.53	0.21	3.64	0.35	3.69	0.22

Note. The mean scores are interpreted as follows: 1.00 – 1.80 (Strongly Negative); 1.81 – 2.60 (Negative); 2.61 – 3.40 (Uncertain); 3.41 – 4.20 (Positive); and 4..21 – 5.00 (Strongly Positive)

Differences in Teachers Attitudes towards the Use of Technology in the Teaching of Mathematics

Table 5 shows that the test indicates that there is a substantial difference in attitudes towards the use of technology (t_{df} = 3.05, p = 0.01) when a t-test for independent means was used to assess major differences in the attitude of male and female mathematics teachers towards the use of technology in mathematics teaching. However, when sub-scales were considered, significant differences were only observed in behavioral engagement (t_{df} = 2.27, p = 0.03), confidence with technology (t_{df} = 2.05, p = 0.05), and mathematics confidence (t_{df} = 3.80, p = 0.01). On the other hand, no significant differences were observed in terms of affective engagement and attitudes toward learning mathematics.

This means that male and female mathematics teachers differ significantly in their attitudes toward using technology in mathematics teaching. Differences in their attitudes toward using technology in mathematics teaching are observed to favor male mathematics teachers. Males are more attentive than females in the use of technology in the teaching of mathematics. They believed that using technology in teaching the subject, considering the COVID-19 pandemic situation, is vital to bring teaching and learning meaningful to both teachers and learners. This is supported by Lee and Anderson (2015), stating that there appear to be gender differences about attitudes to mathematics teaching with technology (Martin, 2003; Watt, 2007). However, there are researches on the role of gender that contradict the claim that there are differences in male and female teachers' attitudes in the teaching of mathematics using technology. Temple and Lips (1989), for example, found out that there were no distinctions between males and females in the personal interest and enjoyment of computers. Similarly, Barkatsas, Kasimatis, and Gialamas (2009) stated that males expressed more positive mathematics views and more positive mathematics views on the use of technology than females. Travers et al also verifies this. In their research (2016), it was found that male teachers relative to female teachers had a better attitude.

It is evident from the results and even from the literature reviewed that both male and female teachers have developed positive attitudes toward using technology in mathematics teaching. They believed that there are challenges brought about by this pandemic, and whether they like it or not, they must use engrossed technology within them. This is new normal, and there might be no possibility that a 100% face-to-face will happen again but might a blended instruction. But they know that behind these challenges are the opportunities brought about by this systemic global dysfunction.

Table 5. t-test Results on Male and Female Teachers' Attitude in the Teaching of Mathematics

Sub-scale	**Sex**			
	Male	**Female**	***t***	***df***
Behavioral Engagement	3.77 (0.76)	3.26 (0.64)	2.27*	96
Confidence with technology	3.68 (0.75)	3.31 (0.46)	2.05*	96
Mathematics Confidence	3.80 (0.15)	3.37 (0.36)	3.80*	96
Affective Engagement	4.43 (0.48)	4.28 (0.43)	1.03	96
Attitude to Learning Mathematics with Technology	3.45 (0.82)	3.62 (0.57)	-0.75	96
Attitude as a whole	3.83 (0.25)	3.57 (0.25)	3.05	96

Note. * = $\rho \leq 0.05$. Standard deviations appear in parentheses to the right of the means.

There is no significant difference in the attitudes of primary , intermediate, and junior high school teachers towards the use of technology in mathematics teaching (F(2,96) = 1.60, = 0.21) and behavioral involvement

(F(2,96) = 0.60, = 0.56), trust in mathematics (F(2,96) = 2.40, = 0.10), and affective engagement (F(2,96) = 1.52, = 0.23), as shown in Table 6. Significant variations were found, however, in their attitudes towards the use of technology in mathematics teaching and in their faith in technology (F(2,96) = 9.30, = 0.01) and their attitude towards mathematics learning with technology as a sub-scale (F(2,96) = 3.68, = 0.03).

The result presented in this table revealed that mathematics teachers, when grouped according to year level, differ significantly in their attitudes toward using technology in mathematics classrooms regarding confidence with technology and attitudes to learning mathematics with technology. However, significant differences can be traced between primary and junior high school teachers with a mean difference of -0.68 and between intermediate and junior high school teachers with a mean difference of 0.50. Mean differences in this regard indicate that primary and junior high school teachers differ significantly in their attitudes to learning mathematics with technology and confidence with technology. The same result of no significant differences was also observed between intermediate and junior high school teachers. Significant differences between primary and junior high school teachers favor junior high school teachers. Likewise, significant differences between intermediate and junior high school teachers favor junior high school mathematics teachers. This result can be taken to mean that junior high school teachers have better attitudes toward using technology in mathematics teaching because junior high school mathematics teachers were exposed quite a longer time than the primary mathematics teachers. However, this is denied by Tabuk (2018) in her study on teachers' attitudes, which revealed that grade level is not a significant factor in attitude scores.

Table 6. Variance Analysis on Teachers' Attitude Towards Teaching Mathematics when Grouped According to Grade Level Taught

Sub-scale	Sub-scale	M	F
Behavioral Engagement	Primary Level	3.22 (0.78)	0.60
	Intermediate Level	3.48 (0.74)	
	Junior High School	3.40 (0.58)	
Confidence with technology	Primary Level	3.08 (0.41)	9.30*
	Intermediate Level	3.27 (0.49)	
	Junior High School	3.76 (0.51)	
Mathematics Confidence	Primary Level	3.40 (0.25)	2.40
	Intermediate Level	3.36 (0.44)	
	Junior High School	3.61 (0.37)	
Affective Engagement	Primary Level	4.15 (0.34)	1.52
	Intermediate Level	4.36 (0.55)	
	Junior High School	4.40 (0.39)	
Attitude to Learning Mathematics with Technology	Primary Level	3.78 (0.59)	3.68*
	Intermediate Level	3.73 (0.68)	
	Junior High School	3.28 (0.53)	
Attitude as a whole	Primary Level	3.53 (0.21)	1.60
	Intermediate Level	3.64 (0.35)	
	Junior High School	3.69 (0.22)	

Note. * = $\rho \leq 0.05$. Standard deviations appear in parentheses to the right of the means.

Conclusions

COVID 19 pandemic has severely disrupted the educational momentum of many countries. The Department of Education (DepEd) is still adamant about the most suitable delivery to make students learn. With the scenarios, one very relevant problem to entertain is how students cope with the changing times, specifically their desire to learn despite this crisis. In this regard, teachers must develop a positive attitude toward using technology in teaching.

With the rise and continued proliferation of the COVID-19 pandemic, teachers handling mathematics as a subject should enhance their skill in using technology in teaching. Teachers were positive in the use of technology in teaching, more specifically in mathematics teaching. The teachers' positivism has put the Department of Education high hopes that quality teaching and learning would still be possible. These mathematics teachers' responses will motivate school heads and other school authorities to continue finding ways to sustain teachers' positive attitudes toward using technology in mathematics teaching. If the use of technology in teaching will not be given proper attention, in that case, the Department of Education will surely defeat its purpose of aiming quality education to the learners.

Recommendations

Despite the demands and challenges experienced by mathematics teachers in teaching the subject in the new normal education, mathematics teachers are still positive towards teaching with technology to bring meaningful learning to the teachers. However, school heads and other higher authorities are uncertain whether or not mathematics teachers' attitudes toward using technology in teaching mathematics will be sustained. In this regard, the study recommends that to maintain positive attitudes toward using technology in mathematics teaching; mathematics teachers should be provided with enough and good training on capacitating themselves with using technological tools in mathematics teaching. Programs on how to sustain and improve teachers' attitudes towards the use of technological tools should be drafted and implemented. Likewise, mathematics teachers are encouraged to attend online seminars and training, specifically using different online platforms to teach the subject area.

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