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Technological Capabilities of Teachers in Using Digital Modality

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Abstract

The pandemic reminds every teacher that everything must be done as quickly as possible to respond to every challenge and new development in the teaching process. In addition, it is necessary to recognize how to engage with students and deliver efficient and effective instruction. This study aims to assess teacher's technological capability in the use of digital modality in the classroom. Purposive sampling was used in the quantitative study, and 62 teachers participated in the study. The data was analyzed using JASP software. The study researched the level of technological capabilities of the teachers and its relationships between technological capability levels and teachers' age, teaching experience, and educational attainment. The results show that technological capabilities of teachers were "Distinguished". It implies that young teachers have higher technological capabilities than older teachers. However, since age has a significant relationship with technological capability, it may be used as a basis of intervention. This study can be used as baseline information for the teachers upskilling and retooling technological capabilities. As teachers extend their service and increase in age additional technology training should be provided.

Introduction

Considering the change in perspective about using digital technology as a medium of delivering instruction, this study aims to assess the technological capabilities of teachers and how to assist teachers in improving their technological abilities in combination with the difficulty of delivering an effective and efficient learning-teaching process. With an overflow of training and preparation for the use of technology in instruction, teachers are bombarded with various useful tools and applications utilized in this study, which will guide what level of competencies teachers have specifically in technological capabilities and on the use of digital modality as a learning approach in public school. Although a learning continuity plan was created, and directions were given, it was predicted that obstacles and issues would arise. Another worry is how to deal with the difficulties that students may face in digital modality (Arrieta, Calabio, & Rogel, 2020). Tupas and Linas-Laguda (2020) assert that utilizing blended learning in school is more likely to engage positively in all activities, have improved learning behavior, and are more likely to become leaders, coaches, and mentors to their peers. With the introduction of technology, educators realized the value of

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technology, which has since become a vital aspect of teaching and learning. As a result of studies exposing how technology improves learning, a variety of educational tools and platforms have been developed and are now integrated into the curriculum (Arrieta, 2020). The conduct of professional development by teachers, as necessary instruments for the proper implementation of blended learning, is a critical task in achieving the addressed goals in the curriculum which signifies that teachers must strengthen their technological capabilities by applying and becoming innovative teachers in the 21st-century learning design. Furthermore, educators' teaching practice has a significant impact on students' learning, and for teaching to be successful, teachers must have a broad range of knowledge. This, of course, also applies to the education of technology (Fahrman, Norström, Gumaelius, & Skogh, 2019).

The ever-changing educational landscape requires teachers to adapt and improve their competencies, particularly in integrating technology into their delivery of instructions. Furthermore, teachers should be trained with blended learning competencies when Education 4.0 enters the classroom (Ventayen, Salcedo, Orlanda-Ventayen, Ventayen, & Ventayen, 2019). This means every teacher needs the adoption learning in their real-life scenarios which further deepens the dedication, and they are committed to reaching the students in different ways and one of these is through utilizing digital modality. According to Iftakhar (2016) teaching in the twenty-first century entails instructing the twenty-first generation. It entails assisting and monitoring students as they study 21st-century skills that should be implemented. To provide the best learning in the virtual world, teachers must be willing to engage with any new technology. Aside from the real classroom, there is an online classroom. Using technology, the researchers will acquire a greater understanding of the different problems and concepts that underpin the educational environment which is the digital modality. Thus, teachers must have a firm grasp on upskilling and retooling their skills and knowledge on utilizing digital modalities in the learning and teaching process. As De Vera, Andrada, Bello, and De Vera (2021) reiterates that the current state of our country's educational system necessitates a stronger push and a hopeful outlook that we will be able to make improvements. Teachers should take personal initiative, welcome possible ways to improve the current system, and participate in reforms to assist our country to improve and tackle difficulties and endeavors.

Batac, Baquiran, and Agaton (2021) add to the discussion by noting that in the new normal of education, the promotion of teacher professional development and continuing to develop learning platforms that provide open access to high-quality, dependable educational resources throughout and beyond the pandemic. Teachers will be the mainstay and effective way to deliver a better and more successful educational program during the pandemic, as they will be the key to each student's success in the challenge of the pandemic. As a goal for 21st-century capabilities, the outcomes of this study will assist teachers in growing personally and professionally by identifying their technological capabilities and experiences in digital modality. Moreover, Ritz's (2017) notions on technological teachers must also be educated in teaching approaches and enhance their talents to teach all learners technology knowledge and related skills. People would struggle to understand how technological systems work without technology teachers, preventing society from progressing to higher levels. Skilled teachers will be effective if they can apply what they've learned in the classroom to real-life situations. The goal of the study is to make teaching and learning more relevant and enjoyable, as well as to improve instruction delivery in the new era of education and one of these innovative works of a teacher is to utilize Google classroom for efficient and effective learning instruction. Furthermore, utilizing digital modality has positive repercussions as we go into the new normal of having a streamlined online educational experience (De Vera, 2020). De Vera study focused on effective teaching and learning depended on teachers' technology capabilities. The procedure entailed determining what students are supposed to learn, assessing whether they have learned it, and looking for ways to improve student learning. To pique the learner's attention, we must be dynamic and interested as educators.

Google Classroom is an example of a free tool that has gained a lot of traction in a short amount of time. Digital has grown increasingly crucial in education at all levels, but educators have struggled to choose which of the many accessible technology tools best matches their teaching approaches (Azhar & Iqbal, 2018). Similarly, Slomanson's (2014) notions of blended learning bring these two approaches together. Online learning is defined as a setting in which the professor delivers lectures from home while the students complete homework in class in which students study using their time and availability with full access at home. Thus, teachers' attitudes toward

technology about personal factors such as gender, teaching experience, pre-service major, and in-service training frequency, consider teachers' attitudes as an important factor influencing students' learning (Xu, Williams, Gu, Liu, & Hong, 2021). Teachers' dedication and commitment will never be untiredly to support the learning of the students and the upgrading of skills and knowledge in delivering lessons on using technology will suffice the ever-changing educational landscape.

This study aims to assess the technological capabilities of each teacher who has different levels of understanding and experiences in utilizing digital modality, particularly in using different online and digital platforms.

Objectives

The goal of this research was to assess teachers' technological abilities in using digital modalities. The following aims were intended to be addressed by this research: (1) to identify the profile data of the respondents in terms of age, gender, educational attainment, length of service, and teaching position, (2) level of technological capabilities of teachers, (3) challenges perceived by the teachers in integrating digital modality for delivering instructions and (4) relationship between the profile data of the teachers and their technological capabilities.

Conceptual Framework

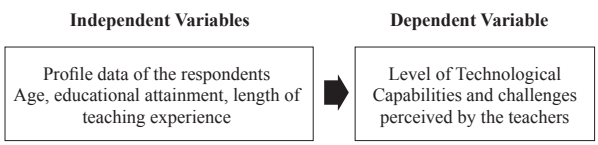

Figure 1 Conceptual framework

Researching teachers' technological capabilities in the implementation of digital modality will aid in the development of a teacher assistance program to deepen and expand our knowledge and skills in the use of technology. Based on the problems, level of technological capabilities, and experiences, an indication of whether their professional development, such as age, educational attainment, and years of teaching experience, affects technology capabilities. As Siemens (2005) reiterated that Connectivism is the incorporation of concepts explored by chaos, connection, and interconnectivity theories, as well as identity theory. With teachers' dedication to providing quality service and education, it is also necessary to be adaptable and stable in every exploration of what is new and trends in delivering instructions, importantly teachers are the drivers of the learning process.

Research methodology

1. Research design

This study follows a quantitative descriptive-correlation research design. As Omair (2015) stated that correlation coefficient is utilized in statistical analysis to assess the relationship between two numerical variables. The design was applied as a method to understand the current ability of teachers in using technology at work. A Pearson-moment correlation was used to see if there is a correlation between the profile data and their technological capabilities.

2. Research instrument

The research instrument was made through a survey questionnaire with the aim to understand the technological capabilities of the teachers by receiving their responses on their profile data, challenges, and teaching experiences and to develop a proposed technical assistance program for the teachers to enrich and expand their knowledge of modern technology used in education. Specifically, the research instruments delved into the following: (a) profile data of the respondents, (b) level of technological competencies, and (c) challenges perceived by the teachers in utilizing digital modality. It was validated by a master teacher, a head teacher, and a research coordinator at a national high school in the Philippines.

3. Participants of the study

The respondents were secondary public-school teachers in one of the public schools in the Philippines.

Table 1 Profile data of the respondents

Profile data of the respondents	Frequency	Percentage (%)
Age		
21-30	19	31
31-40	16	26
41-50	19	31
51-60	8	13
Gender		
Female	47	76
Male	15	24
Educational Attainment		
Bachelor's Degree	17	27
Master's Degree	14	23
with units leading to master's degree	27	44
with units leading to Doctorate's Degree	4	6
Length of service		
1 - 5 years	18	29
6 - 10 years	22	35

Table 1 (Continude)

Profile data of the respondents	Frequency	Percentage (%)
11 - 15 years	4	6
16 - 20 years	8	13
21 - 25 years	5	8
26 - 30 years	3	5
over 30 years	2	3
Teaching position in Secondary Schools		
Teacher I	25	40
Teacher II	19	31
Teacher III	15	24
Master Teacher I	2	3
Master Teacher II	1	2

The data reveals that the majority of the respondents were female at 76% and male at 24%. The data also revealed that most of the respondents earned units leading to a master's degree at 44%, while 27% earned a bachelor's degree, 14% finished a master's degree and 6% of the respondents were studying in a doctorate degree program. Regarding respondents length of service, 35% served in the school between 6-10 years followed by teachers serving in the school 1-5 years at 29%, and 13% served between 16-20 years. Lastly, most of the respondents were Teacher I at 40%, Teacher II at 31% and 24% were Teacher III. In the secondary public-school setting, there are positions and ranking, Teacher I, Teacher II, and Teacher IIII. In the ranking, roles and responsibilities are also different. The higher the position improves, the more tasks are given to the teacher.

Teachers' attitudes toward technology are influenced by personal factors such as gender, professional training, pre-service major, and frequency of in-service training, with teachers' views considered a significant element shaping students' learning (Xu et al., 2021). In general, majority of the respondents were female, aged at 21-30 and 41-50 years old, Teacher I at 6-10 years in service and earned units leading to a master's degree.

4. Collection of Data

The researcher visited the school head to conduct the data collection. Aside from personally visiting the school head, a letter was also sent for his official approval. The respondents were secondary public-school teachers. The chosen public school is the biggest public school in the municipality, making it the best choice for data collection because it has a total of one hundred twenty-two teachers. Google forms were sent to the school's ICT coordinator for dissemination. Information about confidentiality and anonymity was indicated in the google forms. After a few days, there were only a total of sixty-two responses. All responses had complete answers, so they were considered valid for data analysis and interpretation.

5. Data Analysis

The study employs correlational design, beginning with a quantitative analysis of teachers' technological capabilities and challenges in using Google Classroom to deliver digital content as well as significant differences on teacher's technological capabilities and profile data of the respondents and conduct an interview for further explanation of their experience in teaching digital modality. The study used the JASP software to analyze the data. JASP software was created by a quantitative methodologists seeking to enhance numerical analysis (Han & Dawson, 2020). There were 62 teachers who responded to the survey questionnaire. The researchers chose the study's respondents using a purposive sampling technique. To collect the necessary data, the researchers used a set of survey checklist questions and a Likert scale to assess responses. The Likert scale used for the interpretation of the responses is shown below:

Table 2 Likert scale of responses

Scale Value	Range	Verbal Interpretation
4	3.26 – 4.00	Excellent
3	2.51 – 3.25	Distinguished
2	1.76 - 2.50	Proficient
1	1.00 - 1.75	Beginning

6. Ethical Considerations

All school leaders (school head and department heads) were informed before conducting the study through verbal approval and a research proposal. The anonymity of the respondents and the confidentiality of data were assured to the school leaders and the respondents. It was indicated in Google Forms that the data will only be used for the study and that the respondents have the freedom to back out of the study at any time without being asked why.

Results and Discussion

Teachers as agents of transforming the lives of an individual are required to have the ability and capability to adapt in providing quality of service and delivering instructions in response to using new technology. As this study assesses each teacher's technological competencies, it seeks to deepen and broaden their ability to use digital

modality as a method of instruction delivery. It was evident that in the modern world, teachers would be able to use and understand each digital platform and technology. As a result, improving and enhancing their technological competencies is vital for every student's favorable performance and achievement in school. After analyzing, collecting, and interpreting the data, the following are the results:

Table 3 Level of technological capabilities of the teachers in utilizing digital modality

Technological capabilities	Mean	Verbal Interpretation
1. I am happy with my online interactions with my students via messenger, email, Google meet, etc.	3.37	Excellent
2. I can provide timely and relevant feedback on learning tasks in Google Classroom and students queries via messenger.	3.24	Excellent
3. I can provide instruction that is timely and relevant.	3.42	Excellent
4. I can reprimand/correct students in accordance with online etiquette while delivering instruction.	3.31	Excellent
5. There is a reasonable and manageable number of synchronous learning materials, tasks, and tests in the Google Classroom in accordance with the Most Essential Learning Competencies.	3.23	Distinguished
6. Digital modality provides me with the same level of understanding and teaching as when I took it in person.	3.13	Distinguished
7. I can post on time the classwork in the Google Classroom.	3.27	Distinguished
8. I am capable of meeting and exceeding the subject's needs with the use of digital modality.	3.19	Distinguished
9. I can easily maximize the use of the different features in Google Classroom for easy assessment and giving of activities.	3.15	Distinguished
10. I can efficiently arrange, announce, and submit activities in a timely manner in the Google Classroom.	3.27	Distinguished
11. I can follow the different tutorials given by the proponents of the digital modality.	3.21	Distinguished
12. Proper online behaviors are appropriately observed by using stream and classwork in the Google Classroom.	3.34	Excellent
13. I can manage the classwork in the Google Classroom because of its easy feature and accessibility.	3.31	Excellent
14. I can manage my time between school and household commitments and demands.	3.23	Distinguished

Discussion

As gleaned on Table 3, respondents were satisfied to their level of technological capabilities and how teachers perceived and utilized technology in delivery of instructions. Based on the results, teachers were "Excellent" in providing timely and relevant instructions using technology with a mean score of 3.42. Moreover, teachers were happy with online interactions with students via messenger, email, Google meet, etc. with a mean of 3.37. Likewise, teachers can manage the classwork in the Google Classroom because of its easy feature and accessibility and can reprimand/correct students in accordance with online etiquette while delivering instruction with mean of 3.31.

As a teacher who strives to reach each individual and provide service through education, teachers must be able to perform tasks in any setting, whether traditional or virtual. As Rao, Ramesh, and Vandana (2019), found that adopting the concept of educational technology leads to the adoption and development in order to eliminate various learning hurdles. Furthermore, the new normal of having a simplified online educational experience, using digital modality has a favorable impact (De Vera, 2020). Similarly, to Tupas and Linas-Laguda (2020), students who use blended learning in school are more likely to engage positively in all activities, enhance their learning behavior, and become leaders, coaches, and mentors to their peers. Educators have understood the usefulness of technology with the advent of technology, which has since become an integral part of teaching and learning.

Teaching in the twenty-first century, according to Iftakhar (2016), comprises instructing the twenty-first generation. It comprises aiding and supervising students as they study and execute 21st-century skills. Teachers must enthusiastically embrace any new technology in order to deliver the finest learning in the virtual world. This is strengthened by the study of Javier (2020), the assertion essentially means that technology should not be taken for granted and has successfully integrated into the majority of human activities. Likewise, Masry-Herzalah and Dor-Haim (2021) found a substantial, positive relationship between technological capability and interactive learning success. It was obvious that in the modern world, teachers will have the ability and knowledge of each digital platform and utilizing technology. Thus, enhancing and improving their technological competencies is essential for each student's good results and level of learning.

Table 4 Challenges of teachers in utilizing digital modality

Challenges of teachers in utilizing digital modality	Mean	Verbal Interpretation
1. I cannot manage my Google Classroom because of heavy workloads.	2.52	Agree
2. I had a hard time handling different learning modalities (ODL, Digi-Mode, ALPA, Modular) because of different ways in delivering instructions.	2.81	Agree
3. Inability to use Google Classroom due to a lack of knowledge and abilities	2.11	Disagree
4. When it came to using the digital medium, there was no technical aid available.	2.08	Disagree
5. Students become complacent in submitting outputs in Google Classroom.	2.65	Agree
6. Because I am not "techy," I had a difficult time finding online software that would allow me to quickly administer the monitor and check the outputs to the students.	2.23	Disagree
7. I had difficulty in assessment and evaluation in using Google Classroom because of the blurred or unscanned student's output.	2.60	Agree

As a response to lifelong changes in the educational landscape, challenges allow teachers to improve their skills and mastery in their field. In response to this challenge, this study identifies the difficulties encountered by each teacher, particularly when utilizing digital technology. Using any online and digital platforms is one of the innovative ways to deliver instructions for teachers; it also serves as a way for teachers to identify the best areas in which they need to improve. As presented on Table 4, the teachers experiencing difficulties in implementing the digital modality. The data reveals that teachers are having a hard time handling different learning modalities (ODL, Digi-Mode, ALPA, Modular) because of the different methods in delivering instructions with a mean of 2.81. Also, with regards to the submission of the digitalized materials, students become complacent in submitting outputs in Google Classroom with a mean of 2.65. In addition, respondents noted difficulty in assessment and evaluation in using Google Classroom because of the blurred or unscanned student's output with a mean of 2.61.

The findings of this study will aid instructors in growing professionally and personally by recognizing their technological capabilities and encounters in the digital modality as a goal for 21st-century capabilities. Furthermore, Ritz (2017), technological teachers must be engaged in instructional techniques and increase their abilities in order to teach all learners technological skills and competencies needed.

Table 5 Significant relationship of technological capabilities to profile data of the respondents (age, teaching experience in years and educational attainment)

	Variables	Correlation Coefficient	Degree of Correlation	p value	significance at .05
Technological Capability	Age	- 0.45	negatively moderate	< .001	significant
	Teaching Experience in Years	- 0.17	negatively low	.187	not significant
	Educational Attainment	- 0.08	negatively low	.544	not significant

The results on Table 5 shows that technological capability has a negative moderate significant relationship with age, at a p-value < .001. This implies that young teachers have higher technological capabilities than older teachers. It also shows a negative low non-significant relationship between technological capability and teaching experience, with a p-value of .187. The same goes with technological capability and educational attainment, which has a p-value of .544. These findings imply that teaching experience and educational attainment is not a basis for identification of a teacher's technological capability and will not be a basis of intervention to increase a teacher's technology capability. However, since age has a significant relationship with technological capability, it may be used as a foundation of intervention.

Conclusions and Recommendations

Based on the results of the findings, most respondents were "Distinguished" in the level of technological capabilities in utilizing digital modality. As a result, the study aims to provide a way for teachers to further expand and deepen their professional development and technological capabilities. In the modern world, they are gradually developing a sense of adaptability and being resilient to everything that happens, particularly in the integration of technology in delivering instruction. The challenges in adapting to utilizing digital modality, challenges are present but with their willingness to adapt and being resilient in every situation, every teacher can continue delivering quality service and education. This study is for teachers as well as for policymakers to provide training, professional development, and growth opportunities for teachers so that they can improve their technological capabilities in using digital modes, particularly ICT.

Teachers can be imaginative and collaborative in reaching and embracing the change that has occurred

utilizing technology because of the challenges and experiences they face in the educational landscape in the new normal of education. It is a proof that anything is possible because we all have a vision that can be realized. School principals and teachers should design on capacitating their technological skills to be more advanced and beneficial by knowing the technical capabilities of teachers in applying digital modality in school. There will be no embrace of a culture of involvement and transformation until we are committed and dedicated to welcoming innovation and integrating technology. Changes must occur and having a strong leader who can lead teachers into innovation will be more beneficial in strengthening their inherent capabilities and developing a policy that addresses technical assistance, as well as ensuring that the program can be sustained for the following school year. That is why we must push ourselves to make the necessary changes. Because when we adapt and others in our environment witness it, we have the potential to influence others.

Proper dissemination is required to better inform stakeholders, parents, and students about learning modality so that everyone may work together to improve the modality approach and to minimize paper consumption. We are all hesitant to learn at first, but as we work together to reach a common vision and purpose, we will all see a wider picture that we can put into practice. This study implies that no matter how long we have been in service, teachers must deepen their commitment and dedication to having faith in and clarifying the hearts and minds of all students. The study's findings will provide a baseline of information showing even in a public institution, you can work and still provide quality education, not just from the teachers' guidance but with a unified vision and quality service.

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