

Unpacking Malaysian Teacher's Preferences in Using Technology During Covid-19 Pandemic

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SUMMARY

There is scant knowledge of the effects of the COVID-19 pandemic on Malaysian teacher's preferences in using technology as a teaching aid while organizing online classes. This study generally aims to study Malaysian teacher's preferences in using technology as a teaching aid while organizing online classes during the COVID-19 pandemic. Data were collected between March and December 2020 during the implementation of the Movement Control Order (MCO) on Malaysian teachers who teach primary and secondary schools. The research design consists of a survey research design using Teacher Preferences in Using Technology during COVID-19 Pandemic Survey (TPUT-19) as an instrument. In the present study, the majority of the respondents find it difficult to implement online teaching during the COVID-19 pandemic, however they still conducting online teaching. Collated data also shows that most of the respondents prefer to use WhatsApp as the medium of communication, Google Meet as preferred video conference technology, and Google Classroom as the preferred learning management system in implementing online teaching.

Keywords: Communication tools, videoconferencing, learning management system (LMS), COVID-19

INTRODUCTION

Coronavirus disease 2019 (henceforth, COVID-19) is an infectious disease caused by a novel coronavirus called severe acute respiratory syndrome coronavirus 2 (Ministry of Health Malaysia (MOH), 2020). The first case of COVID-19 infection was first identified in Wuhan city, Hubei Province, China in late December 2019 (Ahmed, 2020). It has spread to other regions of China and subsequently to other parts of the world. On 30th January 2020, World Health Organisation (WHO) declared the COVID-19 outbreak as a public health emergency health emergency. As the current outbreak continues to develop, on 11th March 2020, WHO declared the COVID-19 a global pandemic (World Health Organization (WHO), 2020). The implementation of lockdown, movement control order, or quarantine has been enforced as one of the preventive measures to mitigate the outbreak (Abdalqader et. al., 2020).

This enforcement has resulted in the complete paralysis of global activities, including the education system. According to UNESCO (2020), the outbreak has resulted in the closure of over 90 percent of all educational institutions, impacting close to 1.6 billion students. In Malaysia, the education ministry reported over 1.7 million students are out of the classroom (Harun, 2020). Since the education system is completely shut down, all educational institutions have migrated from the face-to-face methods of learning to impart education through online means. To keep the lessons going, teachers have adopted e-teaching mode by using few technologies, from video conferencing via Zoom, Microsoft Teams, Cisco Webex, Google Classroom to using WhatsApp and Telegram to communicate.

The current advancements in technology allow the teachers to integrate a variety of lesson plans into online courses. The dynamic evolution of education technology has called the question of which technology could and should be implemented into the pedagogical approach amid this pandemic (Teras et. al, 2020). Since how students interact with technology is constantly evolving, teachers have a responsibility to understand how students engage (or not) with technology for learning and sharing knowledge (Ferri et al., 2020). Therefore, this paper aims to explore Malaysian teacher's preferences in using technology as a tool for online teaching amid the COVID-19 pandemic.

PROBLEM STATEMENT

Research on the COVID-19 outbreak has risen mainly from medical studies and clinical trials, trying to come up with medicines and vaccines. However, the COVID-19 outbreak has garnered much attention among researchers from various disciplines, including psychological and social impacts of COVID-19 (Brooks et al., 2020; Mamun

et. al., 2020; Morgül et. al., 2020; Sundarasan et. al., 2020; Tee et. al., 2020), socio-economic implications (Fana, Pérez, & Fernández-Macías, 2020; Albu et. al., 2020; Debata, Patnaik and Mishra, 2020; Power, 2020; Song and Zhou, 2020), linguistics (Augustyn & Pražmo, 2020; Joharry, 2020; Olimat, 2020a, 2020b; Sultan and Rapi, 2020; Mohd Nor and Zulcafli, 2020) and education. In education, previous studies have revealed the COVID-19 phenomenon from various education perspectives.

Di Pietro et. al. (2020) reviewed the concerns of teachers, students, and parents amid the circumstances caused due to social isolation. The findings of Di Pietro et. al.'s (2020) study confirmed that social isolation and changes in education have caused several concerns for children, parents, and teachers. The study found that the the most influential factors in teachers' attitudes toward technology and online learning was the lack of teacher's knowledge and skills to integrate technology into remote learning. Sia and Adamu (2020) provided commentary on the challenges and impacts of the COVID-19 pandemic on higher education institutions in Malaysia. Sia and Adamu (2020) stated that lecturers and students are faced with multiple challenges in teaching and learning. Therefore, it is of utmost importance for governments to intervene to better harness the potential of online learning.

Eloksari (2020) reported that government must ensure that every student has the access to online tools and technologies like tablets, laptops, coupled with uninterrupted internet connectivity. Technology can greatly contribute to creating equity in schools. A study by Selvanathan, Mohamed Hussin, and Nor Azizi (2020) also mentioned that online learning and teaching in Malaysia required improvement, in terms of the quality of the instruction and interaction during the course given to the students. A quantitative study by Mok et. al. (2021) analyzed the Mainland China and Hong Kong students' studying abroad expectations after the pandemic. Based on the study, 84 percent of the respondents expressed no interest in studying abroad and will likely stay in the country due to the pandemic. This study indicates that the decrease of international students may potentially cast long-lasting effects on overseas higher education institutions. Studies by Heisel (2020), Helms (2020), Leask, and Green (2020) were coherent with Mok et. al. (2021). This will bring the end of the internationalization of higher education amid the pandemic of COVID-19. However, based on Mercado's (2020) observation, this situation might be reversal based on the previous experiences of SARS in 2003 and the global recession in 2008 as international student mobility will remain strong after the pandemic.

Lie et. al. (2020) explored language teachers' online engagement amid the COVID-19 pandemic in Indonesia. Lie et. al (2020) found that an interplay of five related factors of online learning processes against five levels of engagement. Those five factors are learners, teachers' prior exposure to online learning, the support system, technological knowledge, and pedagogical knowledge. However, teachers in this study were still struggling to improve their quality of online learning engagement. A survey towards studies regarding education involving COVID-19 pandemic local and abroad found that this pandemic has garnered attention from many researchers. This survey also provides a perception that the COVID-19 pandemic must be studied from the education point of view with an array of focal points to see the bigger picture of COVID-19 impact in the education sector.

Research on the primary and secondary school teacher's preferences in using technologies while organizing online classes during the outbreak is necessary because this topic has not been explored. As discussed, past studies on COVID-19 from education perspectives have only studied topics such as concerns of students, teachers, and parents related to social isolation and online learning (Di Pietro et. al., 2020), the impacts of the COVID-19 pandemic on higher education institutions (Sia & Adamu, 2020; Eloksari, 2020; Selvanathan, Mohamed Hussin & Nor Azizi, 2020), the impacts of the outbreak on student's mobility (Heisel, 2020; Helms, 2020; Leask & Green, 2020; Mercado, 2020; Mok et. al., 2020) and online learning engagement (Lie et. al., 2020). Studies by Di Pietro et. al. (2020), Sia and Adamu (2020), and Lie et. al., 2020 (2020) established that studies on technologies as an online teaching tool during the COVID-19 pandemic have yet to be carried out. Currently, there are only a small amount of publications that highlighted the relationship between COVID-19, education, and technology (Thitiwat, Jay, & Abel, 2021).

OBJECTIVE OF THE STUDY

The objective of this study is to study Malaysian teacher's preferences in using technology as a teaching aid while organizing online classes during COVID-19 pandemic.

RESEARCH QUESTION

Specifically, this research aimed to answer the following research questions.

- i) Does teacher find it difficult to implement online teaching during the COVID-19 pandemic?
- ii) What is Malaysian teacher's most preferred communication technologies to implement online teaching during the COVID-19 pandemic?
- iii) What is Malaysian teacher's most preferred video conference technologies to implement online teaching during the COVID-19 pandemic?

- iv) What is Malaysian teacher's most preferred learning management system to implement online teaching during the COVID-19 pandemic?

LITERATURE REVIEW

Communication tools

Due to the current pandemic, students and educators are far away from each other to avoid infection and spreading the viruses. Thus, the use of communication tools (synchronous and asynchronous) is encouraged to make sure students and educators still communicate to ease the teaching and learning process. Branon and Christopher (2001) have conducted an online survey of distance educators from around the world and found out the reasons for choosing synchronous (chat) communication included: brainstorming, holding virtual office hours, team decision-making, dealing with technical issues, and community building.

The use of communication tools, such as Whatsapp, Telegram, WeChat, E-mail, phone call, Instant Messenger, Short-messaging-system (SMS), and other communication tools connecting students and educators so as develop varied collaborative learning skills (Khalil & Ebner, 2017) and portraying emotion while communicating (Chen, Lee, & Huang, 2018). After a decade, chat being used in the learning environment, students still face difficulties when using chats, thus they cannot learn in the same way as their classmates (Calvo, Arbiol, & Iglesias, 2014). Jabbar et. al., (2020) found that for informal communication, higher education employees preferred WhatsApp and for formal communication, they preferred email for communication with students and academic works. They also affirmed the influence of WhatsApp in the learning and teaching process highlighting its quick and effective communication.

Branon and Christopher (2001) suggest a few recommendations for instructors in using synchronous (chat) tools. This tool provides frequent and multiple chat time, thus provide a medium for smaller groups of students online meet up. The synchronous tools also allow a limited amount of 'lurking' by students and provide a specific protocol for online chats.

Lv et. al (2018) highlighting that within the online environment, live chat customer support with a service representative can help individuals to complete tasks within the online environment. While conducting online teaching, educators tend to provide low quality information on the online environment, this drives the use of communication tools such as live chat function to seek further clarification or assurance (McLean & Osei-Primpong, 2019).

Video Conference

Video conferencing is still new to be implemented in schools in Malaysia. Due to the current pandemic, the use of this technology has been imposed unconditionally and with the suggestion by the MOE. However, students argue the struggles with the effectiveness of learning online, noting the intangible's effect over video conferencing and recording applications (Thitiwat, Jay, & Abel, 2021). In higher education, video conferencing has been used actively in distance education (Saleh, 2002). In nursing and medical education, Chipps et al. (2012) recommend that video conference-based teaching is at least as effective as face-to-face teaching from knowledge gains perspective.

Candarli and Yuksel (2012) have administered a 37-item survey questionnaire to 36 students who study English Language Teaching at Yildiz Technical University. This questionnaire probe participant's perceptions of perceived speaker personality traits, expectations, presentation content, and effectiveness, technology, session objectives in video conference-based lecturer. They found that students have positive attitudes towards video conferencing and will use video conferencing in their classes when they become teachers. However, respondents who dictate a slight change of perceptions after the lecture were having technical problems and the content.

Castelli and Sarvary (2020) surveyed introductory biology course that has been shifted to be taught remotely in response to the COVID-19 pandemic. They surveyed students to get a better understanding of why they did not turn on their camera. They found that students are concerned about personal appearance, having a weak internet connection, being concerned about other people and the physical being seen in the background. Thus, suggests that videoconference guidelines for presenters (Finley et al., 2001) and students are a must.

Learning Management System (LMS)

LMS is used to describe several or combination of different educational computer applications (Watson & Watson, 2007). LMSs usually being used for blended and online learning, tracking the student performance, storing student submissions, supporting the storage or displacement of course materials in online mode, and mediating communication between the teachers and the students. In the words of Walker et. al., (2016), LMSs provide many tools within the application itself such as discussion threads, online chat, video conferencing, supporting resources, assessments, peer review, learning modules, e-mail, reusable learning objectives, and content repositories.

Previously, LMSs often being used in higher education (Coates, James, & Baldwin, 2005; McGill & Klobas, 2009), as COVID-19 pandemic distancing students with their teachers, the use of LMSs are gaining popularity and being taken considerably important in helping teachers and students managing their teaching and learning among primary and secondary level educations. LMSs are often confused with other related technologies such as Course Management System (CMS) (Watson & Watson, 2007).

Among the provided answers in the survey are Google Classroom, Blackboard, Canvas, Proctorio, Coursera, LinkedIn Learning, and Microsoft Teams. These LMSs have been chosen and included in the survey noting their popularity among Malaysian teachers and exposure given by the Ministry of Education Malaysia (Ministry of Education Malaysia, 2019). If the teacher used any other known LMS, they can simply write it in the *Others..* answer slot section such as Lotus, Oracle iLearning, Cornerstone OnDemand (Learning Circuits, 2005), NetDimensions EKP, Saba, SumTotal Systems (Carliner, 2005), and WebCT (Weaver, Spratt, & Nair, 2008).

METHOD

Research Design

This study is a survey research design using Teacher Preferences in Using Technology during COVID-19 Pandemic Survey (TPUT-19) as an instrument. This study is based on a total of 925 respondents who teach primary and secondary levels in Malaysia between March and December 2020 and between the ages of 20 and 60 years old. The data were collected by researchers in a web-based survey using TPUT-19 that being converted into Google Form. The face-to-face administration of the survey being avoided due to the COVID-19 pandemic. By surveying online form, the time required for implementation and to collect data can be reduced, making it cost-savvy (no paper, postage, mailing, data entry costs), and sample size can be greater (Owens, 2014). By making the survey online, lead to a good sampling process as mentioned by Fowler (2014) the keys to good sampling are finding a way to give all (or nearly all) population members the same (or a known) chance of being selected and using probability methods for choosing the sample. Figure 1 shows the way analysis of survey data works and the inferences on which is based.

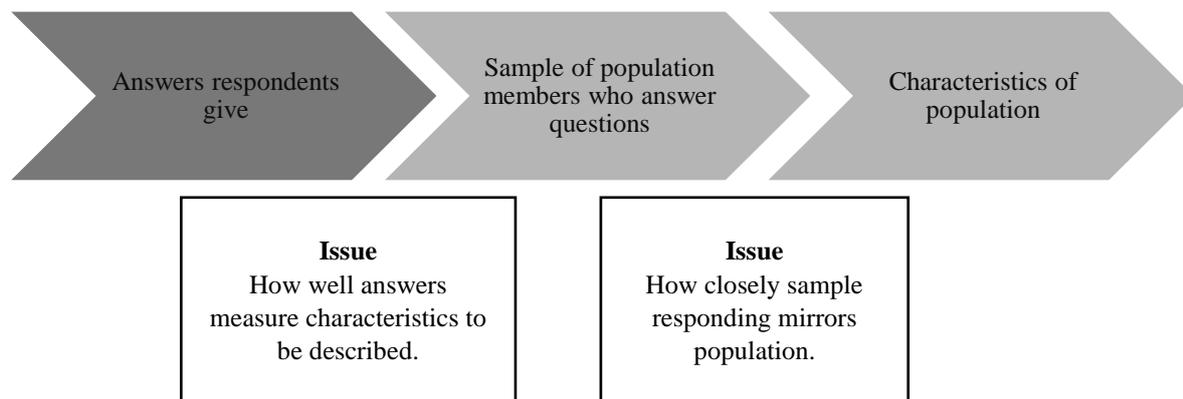


Figure 1. The way analysis of survey data works.

(Source: Fowler, F. J. (2014). *Survey Research Methods* (5th ed.). Los Angeles: SAGE Publications, Inc.)

The way analysis of survey data being conducted is to learn the characteristics of the target population. We then tabulate the collected data from stated variables and assume that the accurate measures of the characteristics of the Malaysian teachers who teach primary and secondary level during the COVID-19 pandemic (March – December 2020). By assuming the measures, we then would like to be able to further assume describing the entire target population.

Outcome Variables

Implementing online teaching: provided by the respondents in their answers to the questions: “Did you implement your online teaching during the COVID-19 pandemic?”, “Did you find it difficult to implement your online teaching during the COVID-19 pandemic?”, and “Where did you (mostly) conduct your online teaching during the COVID-19 pandemic?”. Noted that the phrase ‘during the COVID-19 pandemic’ is stated between March and December 2020 duration. Those who answered ‘Yes’ for the first question were considered conducting online teaching during the given time frame and must answer the next question to describe whether they were having difficulties in implementing online teaching and the place where they implement the online teaching.

Preferred communication technologies in implementing online teaching: provided by the respondents in their answers to the questions: “What is your preferred communication technologies in implementing your online teaching during the COVID-19 pandemic?” where six responses being given provided namely WhatsApp, Telegram, Email, Phone call, WeChat and Instant Messenger. If the respondent used different other communication tools, they can state it on the last answer slot: *Other..* and the respondent can state the other communication tools there.

Preferred video conference technologies in implementing online teaching: provided by the respondents in their answers to the questions: “What is your most preferred video conference technologies in implementing your online teaching during the COVID-19 pandemic?”. A video conferencing system provides at last two cameras being used to capture images of people at a first location participating in a video (Buckler, 2012). The images from the selected camera are transmitted to a person at the other location and vice versa. Among the provided answers are Google Meet, Zoom Meeting, Cisco WebEx Meetings, Ringcentral Meetings, Intermedia AnyMeeting, Zoho Meeting, ClickMeeting, GoToMeeting, BlueJeans Meetings and join.me. If the respondent used different other video conference technologies, they can state it on the last answer slot: *Other..* and respondent can state the other conference technologies tools there.

Preferred learning management system (LMS) in implementing online teaching: provided by the respondents in their answers to the questions: “What is your most preferred learning management system in implementing your online teaching during the COVID-19 pandemic?”. LMS is currently used to describe several different educational computer applications (Watson & Watson, 2007). Among the provided answers are Google Classroom, Blackboard, Canvas, Proctorio, Coursera, LinkedIn Learning, and Microsoft Teams. If the respondent used different other LMS, they can state it on the last answer slot: *Other..* and respondent can state the other conference technologies tools there.

Explanatory Variables

The variables included in the survey were age range, gender, types of schools the teachers are currently working, and the location of their schools.

Age range was categorised in the following groups: 20-29, 30-39, 40-49, and 50-59.

Gender was categorised between female and male.

Location of teacher’s school was categorised between urban, and rural area.

Types of schools the teacher are currently working was based on government and private schools. Types of schools in Malaysia were derived from Educational Data Sector, Educational Planning and Research Division (2018) and depicted in Table 1.

Table 1. Types of schools the teacher are currently working

	Government Schools	Private Schools
Primary level	National School (<i>Sekolah Kebangsaan</i>)	Academic Primary School (<i>Sekolah Rendah Akademik</i>)
	National Type Chinese School (<i>Sekolah Jenis Kebangsaan Cina</i>)	International Primary School (<i>Sekolah Rendah Antarabangsa</i>)
	National Type Tamil School (<i>Sekolah Jenis Kebangsaan Tamil</i>)	Religious Primary School (<i>Sekolah Rendah Agama</i>)
	Special Education School (<i>Sekolah Pendidikan Khas</i>)	
	Special Model (K9) School (<i>Sekolah Model Khas (K9)</i>)	
	Government Aided Religious School (<i>Sekolah Agama Bantuan Kerajaan</i>)	
	Special Model School (<i>Sekolah Model Khas</i>)	
	Sports School (<i>Sekolah Sukan</i>)	
	People Religious Primary School (<i>Sekolah Rendah Agama Rakyat</i>)	
	State Religious Primary School (<i>Sekolah Rendah Agama Negeri</i>)	
	Bimbingan Jalanan Kasih	

	Government Schools	Private Schools
Secondary level	Regular Secondary (<i>Sekolah Menengah Kebangsaan</i>)	Academic Secondary (<i>Sekolah Menengah Akademik</i>)
	Fully Residential School (<i>Sekolah Berasrama Penuh</i>)	Chinese Independent Secondary School
	Religious Secondary (<i>Sekolah Menengah Kebangsaan Agama</i>)	(<i>Sekolah Menengah Cina Persendirian</i>)
	Technical School (<i>Sekolah Menengah Teknik</i>)	Religious Secondary School (<i>Sekolah Menengah Agama</i>)
	Vocational College (<i>Kolej Vokasional</i>)	People Religious Secondary School (<i>Sekolah Menengah Agama Rakyat</i>)
	Special Education Secondary (<i>Sekolah Menengah Pendidikan Khas</i>)	State Religious Secondary School (<i>Sekolah Menengah Agama Negeri</i>)
	Special Model School (<i>Sekolah Model Khas</i>)	MARA Junior Science College (<i>Maktab Rendah Sains MARA</i>)
	Sports School (<i>Sekolah Sukan</i>)	Royal Military College (RMC) (<i>Maktab Tentera Diraja</i>)
	Arts School (<i>Sekolah Seni</i>)	Expatriate School (<i>Sekolah Ekspatriat</i>)
	Government Aided Religious School (<i>Sekolah Agama Bantuan Kerajaan</i>)	International School (<i>Sekolah Antarabangsa</i>)
	Bimbingan Jalinan Kasih	Special Education School (<i>Sekolah Pendidikan Khas</i>)

Population and Sample

The population consisting of teachers who teach in primary and secondary education in Malaysia in both government and private institutions. As of 2020, there are 416,743 teachers in Malaysia, where 235,993 at the primary level and 179,750 at the secondary level (Ministry of Education Malaysia, 2020) (Table 1). As for this study, a total of 925 respondents have answered the survey. Sample has been chosen by using simple random sampling. The number of respondents is suitable with the sample size suggested by Krejcie and Morgan (1970). With a 416,743-population size, with sample size of 925 and a confidence level of 95%, the margin of error was set to be 5%.

To determine whether the sample size of the survey is appropriate or not, the margin of error need to be known. If the margin error looks too big, it is important to increase the size of the sample so that the attitudes of the population surveyed mirrored those of the total population more closely. Hunter (2016) stated that the wellness of the sample mirrored the population is gauged by two important statistics which are confidence level and margin of error. As for this study the margin of error of 5% at a 95% level of confidence.

In a sample survey, only a single sample is chosen from which to generalize (Fowler, 2014). Thus, the selected sample can and will differ slightly from what it would look like if it perfectly mirrored the distribution of characteristics in the population. As suggested by Fowler (2014), by minimizing the random differences between the sample and the population this can decrease this difference. So, the way the sample is selected and designed can affect how closely the sample is likely to mirror the characteristics of the population from which it is drawn. By making the survey online, lead to a good sampling process as mentioned by Fowler (2014) the keys to good sampling are finding a way to give all (or nearly all) population members the same (or a known) chance of being selected.

Instrument: Teacher Preferences in Using Technology during COVID-19 Pandemic Survey (TPUT-19)

Due to the COVID-19 pandemic, TPUT-19 has been administered via a web-based survey using Google Form. By using a web-based survey, this survey did carry advantages as such lower cost (no paper, postage, mailing, data entry costs), the time required for implementation reduced, complex skip patterns can be programmed, and sample size can be greater (Owens, 2014). The web survey has been deployed using various communication platforms available such as e-mail, Whatsapp, Telegram, Facebook, Twitter, Instagram, and many other media socials to reach out to as many Malaysian teachers as possible. The respondent will be screened on the first few items on the survey where they must clarify the types of schools that they are currently working, the location of their institution, and the types of students they are currently teaching. This survey contains 10 items with each item contain few answers and if the intended answer by the respondent is not provided, they can add their answer to 'other' slot.

FINDINGS

Quantitative Data Analysis

Table 2 below shows the number of respondents (female and male) participated in this survey, estimated population (N), age range, types of schools, location of schools, and teacher's preferences in using technology as teaching aid while organizing online classes. Female represented 666 of the respondents while male 925.

Table 2. *The distribution (percentage) of sociodemographic variables between female and male respondents, estimated population (N), age range, types of schools, location of schools, and teacher's preferences in using technology as teaching aid while organizing online classes.*

Variable	Level	Number of Respondents	Total
Number of surveys	n	925	
Estimated population*	N		416,743
Age range	20-29 years old	200	
	30-39 years old	331	
	40-49 years old	258	
	50-59 years old	139	928
Types of schools	Secondary level		
	Government	260	
	Private	11	271
	Primary level		
	Government	566	
	Private	0	566
	Hybrid		
	Government	0	
Private	91	91	928
Location of schools	Urban	570	
	Rural	339	
	Inland (P1/P2/P3)	19	928
Implementing online teaching**	Yes	847	
	No	29	928
Having difficulties to implement online teaching**	Sometimes	52	
	Yes	505	
	No	230	928
Place (mostly) to implement online teaching**	Maybe	193	
	Home	869	
	School	59	928
Preferred communication technologies in implementing online teaching**	WhatsApp	625	
	Telegram	203	
	Email	7	
	WeChat	4	
	Phone call	0	
	Others***	79	
	Google Meet	713	928
Preferred video conference technologies in implementing online teaching**	Zoom Meeting	88	
	Microsoft Teams	60	
	Cisco WebEx	5	
	Others****	62	
	Google Classroom	756	928
Preferred LMS in implementing online teaching**	Canvas	44	
	Blackboard	11	
	Microsoft Teams	7	
	Others*****	9	928

* Ministry of Education (2020)

** during the COVID-19 pandemic (March – December 2020).

***include Edmodo, Instant Messenger, YouTube LiveChat, SMS

****include Ringcentral Meetings, Intermedia AnyMeeting, Zoho Meeting, ClickMeeting, GoToMeeting, BlueJeans Meetings, join.me, BlueButton, Schoology.

*****include Proctorio, Coursera, LinkedIn Learning, Liveworksheet, Kahoot!, Google Form, Quizizz, Moodle.

Research Question 1: Does teacher find it difficult to implement online teaching during the COVID-19 pandemic?

From Table 2, 505 respondents find it difficult to implement their online teaching, while 230 respondents disagree with this statement, and 193 respondents responding with 'maybe' with the difficulty to implement online teaching during the COVID-19 pandemic. Meaning that 54% of respondents are having difficulty implementing online teaching, 25% of respondents are not having difficulties while 21% stated that they 'maybe' having difficulty implementing their online teaching. Nevertheless, 91% of respondents are still implementing their online teaching, 3% respondents are not implementing their online teaching due to these difficulties while 6% stated that they 'sometimes' implement the online teaching. The place where the teacher implementing their online teaching also might be affecting respondents to implement their online teaching. From the collated data, 94% of respondents implemented their online teaching at home while 6% of respondents implemented their online teaching at school.

Research Question 2: What is teacher's most preferred communication technologies to implement online teaching during the COVID-19 pandemic?

From Table 2, the most preferred communication technologies among Malaysian teachers are WhatsApp with 68% of respondents while Telegram is the second most preferred communication technology while implementing online teaching. Other medium of communication technologies is still being used but not as preferred as WhatsApp and Telegram. Email, WeChat, Edmodo, Instant Messenger, YouTube LiveChat, and SMS are still being used by the respondents but not as preferable as WhatsApp and Telegram with 9% respondents. The feasibility of these two technologies has led to the preference of the use by the teachers in implementing online teaching. According to Nida et al., (2020) by using WhatsApp, the teacher can send a variety of learning content whether in the form of videos or files. The teacher also can interact directly with students through chat or video calls with them.

Research Question 3: What is teacher's most preferred video conference technologies to implement online teaching during the COVID-19 pandemic?

Video conference technologies are one of the essential technologies while implementing online teaching. Literature has shown that video conference improves learning by meeting people that were previously inaccessible due to several constraints (Dogget, 2008, Martin, 2005). During the COVID-19 pandemic, schools were closed, students are isolated from each other in their homes, thus video conferences are being used as one of the technologies in implementing online teaching. From Table 2, the most preferred video conference technologies among Malaysian teachers in implementng online teaching during the COVID-19 pandemic was Google Meet with 75% respondents followed by Zoom Meeting with 9%, and Microsoft Teams and Cisco WebEx Meetings respectively with 6% and 1% respondents. The remaining 9% of respondents used *Others* video conference technologies which include Ringcentral Meetings, Intermedia AnyMeeting, Zoho Meeting, ClickMeeting, GoToMeeting, BlueJeans Meetings, join.me, BlueButton, and Schoology.

Research Question 4: What is teacher's most preferred learning management system to implement online teaching during the COVID-19 pandemic?

From Table 2, the most preferred LMS to implement online teaching during the COVID-19 pandemic among Malaysian teachers was 84% of respondents who prefer to use Google Classroom followed by Canvas, Blackboard, and Microsoft Teams with 5%, 1%, and 1 % respectively. The remaining 9% of respondents used *Others* LMSs which include Proctorio, Coursera, LinkedIn Learning, Live worksheet, Kahoot!, Google Form, Quizizz, and Moodle.

CONCLUSION AND DISCUSSION

This study generally aims to study Malaysian teacher's preferences in using technology as a teaching aid while organizing online classes during the COVID-19 pandemic. Data were collected between March and December 2020 during the implementation of the Movement Control Order (MCO) on Malaysian teachers who teach primary and secondary schools. The research design consists of a survey research design using Teacher Preferences in Using Technology during COVID-19 Pandemic Survey (TPUT-19) as an instrument. In the present study, the majority of the respondents find it difficult to implement online teaching during the COVID-19 pandemic, with 54% of respondents are having difficulty implementing online teaching, 25% of respondents are not having difficulties while 21% stated that they 'maybe' having difficulty implementing their online teaching. However they still conducting online teaching with 91% of respondents are still implementing their online teaching, 3% respondents are not implementing their online teaching due to these difficulties while 6% stated that they 'sometime's implement the online teaching. The place where the teacher implementing their online teaching might be affecting their online teaching. Most of the respondents implemented online teaching at home.

Communication tools, video conferencing, and LMSs are a powerful technology that has yet to reach their full potential and are important for the Information Age paradigm of education (Watson & Watson, 2007). The collated data shows that most of the respondents prefer to use WhatsApp as the medium of communication with 68% of respondents while Telegram is the second most preferred communication technology while implementing online teaching with 22% of respondents. The feasibility of these two technologies has led to the preference of the use by the teachers in implementing online teaching. According to Nida et al., (2020) by using WhatsApp, the teacher can send a variety of learning content whether in the form of videos or files. The teacher also can interact directly with students through chat or video calls with them.

The most preferred video conference technologies to implement online teaching during the COVID-19 pandemic was Google Meet with 75% of respondents followed by Zoom Meeting with 9% of respondents and Microsoft Teams and Cisco WebEx Meetings respectively with 6% and 1% respondents. The remaining 9% of respondents used *Others* video conference technologies which include Ringcentral Meetings, Intermedia AnyMeeting, Zoho Meeting, ClickMeeting, GoToMeeting, BlueJeans Meetings, join.me, BlueButton, and Schoology. Literature has shown that video conference improves learning by meeting people that were previously inaccessible due to several constraints (Dogget, 2008, Martin, 2005). During the COVID-19 pandemic, schools were closed, students are isolated from each other in their homes, thus video conferences are being used as one of the technologies in implementing online teaching. As for LMS to implement online teaching during the COVID-19 pandemic, respondents mostly prefer to use Google Classroom followed by Canvas, Blackboard, and Microsoft Teams. This was due to the popularization of Google Classroom as compared to other LMS (Nurhidayah Hairom, 2022).

Suggestion for Further Research

Our end of 2020 school's terms survey has given us information on what is teacher's preferences in using technology as a teaching aid while organizing online classes. This will provide a plan for the next terms as the COVID-19 pandemic continues. Our data-driven recommendations encourage the use of multi-type of technologies to make sure no students are left behind. Jiang (2020) and Morris (2020) suggested that to maintain attention among students during online teaching, it is encouraged to give students breaks, especially with longer classes. Thus, further research should be implemented on how teachers across Malaysia implementing online teaching to cater to a variety of demographics. Probing this issue will provide further data to all the stakeholders on their planning in regard to distance education or remote learning as the COVID-19 pandemic is still raging.

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