Teachers' Readiness to Implement Emergency Remote Teaching during Learning Disruption

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Abstract – In response to the disruption of education worldwide, teachers must change from a traditional face-to-face pedagogical approach to remote teaching and integrate information communication and technology (ICT). However, many teachers are inexperienced with technology, as remote learning is uncommon, particularly in primary and secondary schools. Thus, there is a pressing need to identify teachers' readiness to implement remote teaching during global crises. By doing so, it will be possible to gather feedback for policymakers and school leaders concerning strategic interventions, as well as support the implementation of remote teaching. This study aimed to identify teachers' readiness to implement remote teaching in response to learning disruption. A total of 4,985 primary and secondary school teachers were selected, using random sampling, from five different states in Malaysia. A 26-item instrument consisting of four dimensions – attitude, perceived behavioural control, subjective norm and ICT efficacy – was used in this study. The Cronbach Alpha coefficient was 0.81 for the entire scale. Based on this analysis, teachers' readiness was found to be at a high level on all four dimensions. Attitude was found to be the highest, and norm subjective was found to be the lowest. Based on these findings, this study provides suggestions on how to sustain momentum when undertaking remote teaching amidst learning disruptions caused by the current COVID-19 pandemic, and disruptions we might encounter in the future

Keywords – COVID-19; emergency remote teaching; home-based learning; learning disruption; pandemic; teacher readiness

I.   INTRODUCTION

Unavoidable circumstances have affected 94% of the world's student population and caused global learning disruption. The current COVID-19 pandemic has resulted in the largest disruption of education in history (UNESCO, 2020a). In order to adapt, nearly every country has developed a contingency plan to facilitate undisrupted learning. This has involved replacing face-to-face teaching with remote teaching, and caused significant changes in conventional instructional practices (Alam & Tiwari, 2020; Sokal, Trudel

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& Babb, 2020; UNESCO, 2020b) in accordance with different countries' policies and implementation strategies (Tauson & Stannard, 2018; Tumwesige, 2020; UNESCO, 2020a; Zhao et al., 2020). Despite the variety of implementation methods, governments' immediate measures reflect common goals: to curb the spread of the disease, provide uninterrupted learning (Alam & Tiwari, 2020; Leacock, Warrican & Warrican, 2020), and reduce the inequality affecting access to education (UNESCO, 2020c).

Remote teaching is a form of distance learning, or an educational situation in which teachers and students are located in different physical environments (Doghonadze, Aliyev, Halawachy, Knodel & Adedoyin, 2020). Remote teaching or distance learning is not new, as both approaches have been applied in education since the 19th Century. The method has also undergone significant technological improvement (Doghonadze et al., 2020; King, 2001; Morgan, 2020; Phan & Dang, 2017; Toquero, 2020). During the pandemic, remote teaching has been indispensable (Doghonadze et al., 2020; Kaur, 2020). Large-scale national efforts to utilise technology in support of remote teaching are emerging and evolving quickly in response to COVID-19 (Ali, 2020).

The rapid evolution of Information Communication and Technology (ICT) explains why the integration of technology in education continues to receive considerable attention, particularly in the wake of the COVID-19 pandemic. Utilising a mixture of technologies, remote teaching provides immediate solutions by which most schools can ensure continuity in learning as they adapt to a distance learning system. This involves the use of online learning platforms or technological devices such as mobile phones, tablets, radio and television (UNESCO, 2020b). Nevertheless, emergency remote teaching differs from ordinary online teaching, as educators have needed to replace face-to-face teaching with online teaching within little time to plan, design or select the best teaching tools for students (Juhary, 2020). Online education typically requires careful planning, and it could take weeks or months to ensure that the curricula are delivered effectively (Manfuso, 2020). As emergency remote learning has been employed as a temporary measure, the skills and strategies used differ significantly from ordinary online education.

Nearly 500,000 teachers have been affected by school closures, and Malaysian teachers are no exception to this (UNICEF Malaysia, 2020). As a result of the pandemic, the country's education landscape has changed dramatically (Jowati Juhary, 2020). In response to nationwide school closures, remote teaching has been implemented abruptly and led to unavoidable challenges, particularly for teachers who are responsible for driving the implementation (Kaden, 2020; Lapada, Miguel, Robledo & Alam, 2020a; Rasmitadila et al., 2020; Vu et al., 2020). Malaysian teachers need to make an

additional effort and exhibit commitment to their profession, as they were initially trained to teach in-person or face-to-face (Hibrahim, 2020). At this critical juncture, teachers' readiness to deliver remote teaching should not be overlooked, as teachers are the front-line workers that determine its implementation (König, Jäger-Biela & Glutsch, 2020; UNESCO, 2020b; UNICEF Malaysia, 2020; World Bank, 2020).

II.   PROBLEM STATEMENT

As the most critical intellectual resources in any school, teachers have encountered various financial, physical, and mental challenges as a result of COVID-19 (Bouckenooghe, Devos & Van den Broeck, 2009). They have been tasked with implementing new teaching practices in ways that will promote student learning and maximise student safety (UNESCO, 2020b). Consequently, teachers face significant challenges to adapt to online teaching, maintain adequate communication with students, and support students' own learning and development (Sokal et al., 2020). Therefore, in order to make the implementation of remote teaching more successful and sustainable, a better understanding of teachers' readiness as key figures in the transition is critical (Akarawang, Kidrakran & Nuangchalerm, 2015; Hung, 2016). If teachers are not ready for change, they may be more likely to develop negative attitudes and resistance (Fullan, 2007), and this will limit their engagement and deprive both themselves and their students of positive results in the long term (Fedina, Burmykina, Zvezda, Pikalova, Skudnev & Voronin, 2017).

In the light of this, it is crucial to understand teachers' experiences of emergency remote teaching and provide specific recommendations to improve the overall quality and effectiveness of remote teaching during global crises, and overall. Therefore, this study is designed to identify teachers' readiness to implement remote teaching during learning disruption. The research aims to measure teachers' readiness in accordance with four elements: attitude, norm subjective, perceived behavioural control and ICT efficacy.

III.   LITERATURE REVIEW

Teachers' Readiness for Emergency Remote Teaching

Emergency remote teaching is arguably a new concept that has emerged as a result of the pandemic (Hodges, Soore, Lockee, 2020). In response to the need for education, emergency remote teaching can be used as a temporary solution that allows all students to continue with their lessons (Juhary, 2020). This has demanded a change in teachers' pedagogical approaches, as face-to-face teaching has transitioned to remote teaching.

In response to the pandemic, the implementation of remote teaching has been perceived as inevitable, and a change to which teachers must adapt (Rasmitadila et al., 2020). Undeniably, lessons that utilise ICT appear to be the most feasible and appropriate form of remote teaching, particularly during a pandemic. Prior to the outbreak of COVID-19, the integration of ICT has been emphasised within 21st Century teaching and learning processes, as demonstrated by the Malaysian Education Blueprint 2013-2025. Significantly, the belief that students are digital

natives, who tend to adapt easily to the use of technology in education, may be inaccurate, particularly during the current learning crisis. Students may use various ICT platforms or devices for leisure and entertainment, but not for formal learning (Margaryan, Littlejohn & Vojt, 2011; Wang, Hsu, Campbell, Coster & Longhurst, 2014). Additionally, primary-school students need further assistance and support from knowledgeable figures such as parents, or learning support, rather than complete independence to use ICT equipment and online learning platforms (Drane, Vernon & Shea, 2020a). Therefore, the integration of ICT practices during the pandemic has presented a significant challenge for both teachers and students. Abrupt and large-scale changes are most likely to be met with strong resistance and limited readiness from everyone involved (Davis, 1989).

Recent studies, conducted across the globe, have emphasised teachers' well-being as they deliver remote teaching during the global crisis. In countries such as Azerbaijan, Georgia, Iraq, Nigeria and the United Kingdom, teachers were found to be unprepared to conduct distance learning with optimal efficiency (Doghonadze et al., 2020). Contrastingly, in countries that had previously experienced several crises, such as the USA, Saudi Arabia, the Philippines, Vietnam and Indonesia, teachers were familiar with distance learning tools, and had some experience of working remotely (Alqabbani, Almuwais, Benajiba & Almoayad, 2020; Kaden, 2020; Rasmitadila et al., 2020; Vu et al., 2020). Although these studies showed substantial differences in their findings, most studies on emergency remote teaching concluded that teachers encountered enormous challenges. They found that it adds to teachers' existing workloads, as more work is needed to transition to high quality distance education (Doghonadze et al., 2020). This condition contributed to higher levels of stress (Federkeil, Heinschke & Klapproth, 2020) and burnout among teachers (Sokal et al., 2020).

Earlier research has also investigated teachers' readiness for change (Armenakis & Fredenberger, 1997; Bouckenooghe, Devos & Van den Broeck, 2009; Hung, 2016) and distance education (Akarawang, Kidrakran & Nuangchalerm, 2015; Fedina, Burmykina, Zvezda, Pikalova, Skudnev & Voronin, 2017; Moral, Martín-Romera, Martínez-Valdivia, & Olmo-Extremera, 2018; Ozturk & Ozen, 2018; Phan & Dang, 2017; Ventayen, 2018). In Malaysia, educators in higher education institutions were found to be ready to undertake emergency remote teaching (Juhary, 2020). However, research on the online learning experiences of teachers at primary and secondary schools is limited (Hung, 2016), particularly in the context of the pandemic (Lapada, Miguel, Robledo & Alam, 2020b; Rasmitadila et al., 2020).

Theory of Planned Behaviour and Social Cognitive Theory

As a theory for explaining general individual behaviour, the Theory of Planned Behaviour (TPB) posits that individual behaviour is driven by behaviour intentions. In turn, behaviour intentions are determined by three factors: attitude, perceived behavioural control and norm subjective.

Attitude refers to the degree to which a person experiences a favourable or unfavourable feeling about performing a particular behaviour. Previous studies have found that attitude is a strong indicator of intention (Datnow, 2020; Suwamee Mohd Solah, 2006). During the 1980s, teachers' attitudes were found to contribute to the successful use of computers in classrooms (Solah, 2006). Prior studies also concluded that attitude, knowledge, and skill in the use of computers contributes significantly to teachers' initial acceptance of computer technology, and their future behaviour regarding computer usage (Al-Furaydi, 2013; Pasani, Amelia & Hassan, 2020). Several studies concerning Malaysian teachers' attitudes found that numerus teachers have a positive attitude towards the use of ICT for teaching various subjects, including core and elective subjects (Ajzen, 2002; Tan, Kareem & Ghouri, 2019; Trafimow, Sheeran, Conner & Finlay, 2002; Venkatesh & Davis, 2000). In addition, a study about attitudes towards e-learning among EFL teachers in Saudi Arabia revealed that teachers' levels of computer literacy have a positive influence on attitudes towards e-learning (Venkatesh, Morris, Davis & Davis, 2003). While most studies highlight teachers' positive stance on the use of ICT in teaching, findings about Malaysian teachers' views towards pedagogical change appear to differ (Venkatesh & Davis, 2000). Hassan et al. (2018) found that teachers' attitudes towards change in relation to cognitive, affective, and behaviour were average. To amend this, researchers proposed that the school's headteacher should ensure that teachers understand the importance of change (Shah, 1998; Venkatesh et al., 2003).

A subjective norm is determined by normative beliefs that acknowledge the expectations of others as an important determinant of behavioural intention (Armenakis, Harris & Feild, 1999). Normative beliefs can be subdivided into multiple groups because individuals may have different views (Violato, Mariniz & Hunter, 1989). For example, a school's headteacher may have a positive attitude towards a particular system, whilst teachers or peers may oppose that system. Normative beliefs are typically measured when a new system is introduced or tested; for example, during the implementation of HBL as a replacement for face-to-face teaching. A subjective norm pertains to a person's perception of the social environment that surrounds their behaviour (Bandura, 1997). In other words, the opinions of others shape an individual's intention to use new technologies in significant ways, because individuals depend on context (Shah, 1998). In their study of college students' acceptance of mobile learning, Cheon et al. (2012) found a significant relationship between subjective norms and intentions. Nonetheless, this effect was not the most substantial. This accords with Shiue's observation (2007) that the use of technology is only slightly influenced by the surrounding subjective environment. Furthermore, a study on the factors affecting trainee teachers' intentions to use technology in Bahrain also found that subjective norms and attitudes towards technology did not significantly impact behavioural intentions to use that technology (Eksail & Afari, 2020). When exploring teachers' acceptance of e-learning technology, Yuen and Ma (2008) emphasised the importance of headteachers' use of technology as a model for their colleagues, as this encourages teachers to adapt.

Perceived behavioural control describes individuals' perceptions of their capability to carry out a particular behaviour (Ajzen, 2002). This can be discussed as two parts: perceived ease of use and perceived usefulness (Trafimow et al., 2002). These two variables are primarily used to explain the determining factors of technology acceptance in Davis's (1989) Technology Acceptance Model (TAM). Perceived ease of use describes the degree to which a prospective user expects the target system to require no effort. Meanwhile, perceived usefulness refers to a prospective user's subjective view that using a specific application system will increase their performance in an organisational context. Previously, these variables were found to have a direct positive effect on users' intentions to use e-learning systems (Venkatesh et al., 2003; Yuen & Ma, 2008).

Lastly, the concept of self-efficacy refers to an individual's belief about their ability, and their motivation to perform specific tasks (Bandura, 1986; 1997). Efficacy has critical effects upon teachers' readiness to change (Armenakis & Fredenberger, 1997). This theory contends that the belief and ability to use ICT successfully relates to decisions about the extent of its use, and the degree to which an individual can learn from training (Yuen & Ma, 2008). Thus, ICT efficacy is an essential component that enhances teachers' readiness to undertake necessary change.

IV.   METHOD

Research design

This was a cross-sectional study conducted among primary and secondary school teachers from five states in Malaysia. The states were selected based on their location in order to represent teachers located in each of the five zones. Four states represent North, South, East, and West in Western Malaysia, while one state represents Eastern Malaysia. Participants were recruited using random sampling. In order to collect data, the questionnaire was shared online and distributed via WhatsApp to the chosen teachers, and was assisted by the involvement of the Education District Officers within each district. All respondents were in-service teachers during or since March 2020, when emergency measures were introduced.

Prior to this study, ethical approval was obtained from the Educational Planning and Research Division (EPRD). Participants were provided with information that indicated their participation was voluntary, and that anonymity would be ensured throughout each stage of the research. Participants' confidentiality was assured, and participants understood that their data were only to be used for research purposes. Participants were informed that they gave their consent to participate by answering the questionnaire. A total of 4,981 respondents completed the questionnaire.

Research instrument

The researchers developed an online questionnaire, comprising four elements from the aforementioned theories, to collect the data (Mansor et al., 2021). The questions were adopted in the light of previous instruments (Fishbein &

Azjen, 1975; Davis, 1989; Compeau & Higgins, 1995), and modified in accordance with the objectives of the present study. The questionnaire consisted of two parts. Part 1 contained demographic questions and Part 2 encompassed 26 items from across four areas: attitude, norm subjective, perceived behavioural control and ICT efficacy. The questionnaire was constructed using a five-point Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree). Respondents were required to reflect on their current experiences of executing remote teaching during the pandemic.

Validity and reliability of the instrument

A panel of three academics, working in the field of education, checked the questions used in the survey in order to ensure their validity. The reviewers confirmed that the questions were clear, readable, comprehensive and suitable for their intended purpose. Internal consistency was assessed using Cronbach's test, and this yielded good results. Cronbach's alpha test was 0.841 for the entire scale of the dataset used in this research. The Cronbach Alpha coefficient was calculated for each of the four components: 0.821 (ICT efficacy); 0.805 (attitude); 0.809 (subjective norm); and 0.731 (perceived behavioral control).

Statistical analysis

Cronbach's Alpha and descriptive statistics were undertaken using Statistical Package for Social Sciences (SPSS) software. Hair et al. (2008, 2010) report that alpha values between 0.60 and 0.70 are satisfactory. Table 1 shows the mean scores recorded for each part of the instrument. The interpretation process was divided into five categories, as shown in Table 1.

TABLE I. THE INTERPRETATION OF MEAN SCORES.

Mean score	Interpretation
1.00 - 1.80	Very Low
1.81 - 2.60	Low
2.61 - 3.40	Medium
3.41 - 4.20	High
4.21 - 5.00	Very High

Source: Tschannen- Moran & Gareis, 2004

V. FINDINGS

General statistics of the study population

A total of 4,981 teachers from five different states in Malaysia completed the online questionnaire. 41.9% of participants were primary school teachers and 58.1% were secondary school teachers. The majority of participants were female (73%), while the remaining 27% were male. Most participants (59.9%) were from rural areas, 38.7% were from urban areas, and 1.4% were from remote areas.

Level of teachers' readiness to implement remote teaching

Table III below shows the teachers' readiness to implement remote teaching. Overall, teachers' readiness was found to be high (M = 3.73; S.D. = .645). The highest overall mean was recorded for the attitude dimension (M = 3.88; S.D. = .598). Meanwhile, the lowest overall mean was recorded for the subjective norm dimension (M = 3.63; S.D. = .696).

TABLE II LEVEL OF TEACHERS' READINESS TO IMPLEMENT REMOTE TEACHING

Dimension	Mean	Standard Deviation	Interpretation
Attitude	3.88	.598	High
Subjective Norm	3.63	.696	High
Perceived Behavioural Control	3.70	.595	High
ICT Efficacy	3.71	.692	High
Overall	3.73	.645	High

Level of teachers' readiness to implement remote teaching (Subjective Norm Dimension)

For most parts, teachers exhibited a high level of readiness (M = 3.63; S.D. = .696). Upon analysis, these results indicate that 88.8% of teachers confirmed that the District/State Education Office provides training to help enhance their competency, and 76.7% reported that they received moral support and encouragement from their school administrator in the process of conducting remote teaching. However, only 50.6% of teachers felt that they received full cooperation from parents/guardians as they implemented remote teaching, and only 44.9% reported receiving feedback/responses from parents/guardians as they implemented remote teaching.

Level of teachers' readiness to implement remote teaching (Perceived Behavioural Control)

The findings indicated that teachers have high levels of readiness to implement remote teaching, as affected by the perceived behavioural control dimension (M = 3.70, S.D. = 0.595). A total of 88.8% of the teachers believed that they could enhance their productivity when conducting remote teaching, as well as encourage their students to undertake self-learning with offline and online learning materials (76.7%). Over 50% of teachers expressed that they felt able to conduct formative assessments using appropriate applications and software (59.5%), produce learning materials easily (59.5%), communicate actively with students (56.1%), and increase parents'/guardians' participation when conducting remote teaching (52.9%). However, only 46.5% reported that they had discussions with parents/guardians to support students' learning from home, and were able to modify learning content according to their students' circumstances and schedules (44.9 %).

Level of teachers' readiness to implement remote teaching (Attitude)

Overall, teachers exhibited high levels of readiness for remote teaching (M = 3.71; S.D. = .702). More than 75% of teachers are positive about implementing remote teaching despite any challenges. Teachers felt able to follow their teaching timetable (84.5%), and always sought to improve their remote teaching skills (77.7%). However, less than 70% of teachers were ready to deliver collaborative remote teaching (68.8%), or to coach (51%) and be coached by other teachers (51.9%). Only 62.2% of teachers attended training to conduct remote teaching.

Level of teachers' readiness to implement remote teaching (ICT Efficacy)

The findings indicated that teachers have high levels of readiness to implement remote teaching, as affected by the ICT efficacy dimension (M = 3.71, S.D. = 0.692). More specifically, the data suggest that teachers were able to upload and download T&L materials (76.7%), integrate diverse remote teaching methods (73.4%), disseminate learning content using several social media platforms (71.3%), create various online tasks (57.4%), deploy different teaching strategies (56.2%), and conduct remote teaching using a live stream (51.6%). Contrastingly, only 45.6% of teachers felt able to communicate confidently using online audio and visual platforms.

VI.   DISCUSSION

This study has examined the levels of readiness to implement remote teaching among primary and secondary school teachers during the COVID-19 pandemic. This has been assessed in relation to four elements: attitude, subjective norm, perceived behaviour control and ICT efficacy. Overall, the findings have shown that teachers' readiness was high across all four factors – which demonstrates that teachers feel able to transition from face-to-face learning to remote teaching in response to learning disruption. This differs from the research of Rafferty and Simons (2006), who claim that large-scale change is likely to be met with strong resistance and limited readiness. However, these findings are similar to existing research that has found teachers from neighbouring countries, such as Indonesia, Vietnam and the Philippines, are equally ready to adapt despite the current challenges (Alqabbani et al., 2020; Kaden, 2020; Rasmitadila et al., 2020; Vu et al., 2020).

Attitude

In comparison with the remaining three dimensions, attitude was found to have the highest mean score. This indicates that teachers' attitudes contribute to their readiness, and are crucial to the process of implementing change (Akarawang, Kidrakran & Nuangchalerm, 2015). Interestingly, within the attitude dimension, teachers' lowest mean score concerned their ability to support their peers to cope with pedagogical change. This may be affected by the additional work (Federkeil et al., 2020) that they contend with while they adjust, as this leaves them little time to support their peers when they are in need. Nevertheless,

while this element yielded the lowest mean, it remains positive and demonstrate that teachers do value peer support. Given the demand currently placed on teachers, peer support may take place gradually, as they continue to adjust.

Subjective norm

The subjective norm dimension was found to yield the lowest mean – which indicates that teachers felt the support provided by their environment, and that its impact on their readiness to implement remote learning was comparatively low. More specifically, parental support in the process of delivering remote learning was particularly low, as compared with that provided by the headteacher or district officer. Just as teachers struggle to motivate their students, parents struggle to find the time to help their children (Tulsa SEED Study, 2020). As a result of travel restrictions, the effectiveness of remote learning partly depends on parents, as schools continually seek feedback relating to the educational needs of the student, and their emotional wellbeing (Drane, Vernon & Shea, 2020b). Without parents' cooperation, teachers' motivation to adapt is affected, and this alters children's learning experiences overall. Therefore, school administrators should facilitate appropriate planning for the implementation of remote learning, and consider every factor that can affect students' learning during this global crisis.

Perceived behavioural control

Overall, the perceived behavioural control dimension was found to be high in this study. This dimension describes the role of technology in teachers' implementation of remote teaching. Despite the unique circumstances, participants were optimistic about the use of ICT to implement remote teaching. This result corresponded with a previous study that involved another higher education institution in Malaysia, as it also found that educators were willing to use technology to implement remote teaching notwithstanding numerous constraints (Juhary, 2020).

ICT efficacy

In this study, the level of ICT efficacy was found to be high. This suggests that teachers felt able to use ICT to implement remote teaching. Upon further analysis, the data showed that teachers' experience with commonly used ICT skills returned the highest average, whereas teachers' use of more complex ICT skills recorded the lowest score. This corresponded with the work of Juhary (2020) and Manfuso (2020) who explain the differences in teachers' use and application of ICT skills, particularly during the current learning crisis.

VII.   CONCLUSION (OR LIMITATION OR SUGGESTION FOR FURTHER STUDIES)

In summary, the study evidenced teachers' readiness for change in the context of the need for emergency remote teaching during a crisis. By analysing the experiences of primary and secondary school teachers in Malaysian public schools, this study contributes to the literature on emergency

remote teaching. The results may inspire educational change within other South East Asian countries and beyond, and may encourage sustainable educational innovations beyond remote teaching. However, this study is affected by certain limitations. Firstly, the study may overlook certain aspects that affect teachers' readiness for change, as this study was designed in the light of selected theories. Secondly, although most studies that investigate readiness for change employ quantitative research designs, the current study may be enriched by additional qualitative work, as this could provide greater understanding of teachers' experiences and opinions about the implementation of emergency remote teaching during the pandemic. In order to understand the implementation of remote teaching more effectively, and consider more than stakeholders' initial readiness for change, further research is needed to investigate both teachers' and administrators' perspectives on remote teaching practice.

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