



# Emergency Remote Teaching: Perceptions of College Vocational Lecturers Towards Constraints and Pedagogical Competencies

Shuhada Abdul Raof<sup>1\*</sup>, Aede Hatib Musta'amal<sup>1</sup>, Haiza Atmareni Harmeni<sup>1</sup>,  
 Norzanah Rosmin<sup>2</sup>

<sup>1</sup>Faculty of Social Science and Humanities,  
 Universiti Teknologi Malaysia, 81310 Skudai, Johor Bahru, MALAYSIA

<sup>2</sup>Faculty of Engineering,  
 Universiti Teknologi Malaysia, 81310 Skudai, Johor Bahru, MALAYSIA

\*Corresponding Author

DOI: <https://doi.org/10.30880/jtet.2022.14.03.002>

Received 02<sup>nd</sup> June 2021; Accepted 27<sup>th</sup> June 2022; Available online 31<sup>st</sup> December 2022

**Abstract:** This study aims to identify the perceptions of vocational college lecturers on the constraints and pedagogical competencies that need to be possessed in delivering the curriculum when the COVID-19 pandemic hits the country. The curriculum delivery method implemented in this study is online with emergency remote teaching (ERT) method. This study was a quantitative study that used a set of questionnaire as a research instrument. The respondents of this study consisted of 364 lecturers of KV throughout Malaysia. The data collected were analysed using the SPSS software. Multivariate analysis of variance was used to analyse the data. The results of the study found that enabling conditions factor and technological factor are the main constraints for KV lecturers in implementing ERT teaching. Overall, the level of lecturers' constraints is at a moderate level. Meanwhile, from the aspect of pedagogical competence of lecturers in implementing ERT is also at a moderate level. The one-way ANOVA test conducted showed that there was a significant difference between the gender factors on the constraints and the pedagogical competence of the lecturers in implementing ERT. The study is significant to Malaysian Vocational College in identifying lecturers' perceptions of the constraints faced in implementing teaching during the COVID-19 pandemic. Besides, this study is important to identify the pedagogical competencies possessed by lecturers when implementing teaching and learning at home using ERT.

**Keywords:** Emergency remote teaching, COVID-19 pandemic, vocational college lecturers, teaching and learning

## 1. Introduction

In November 2020, the number of COVID-19 cases in Malaysia has increased by 48,520 and, the rate of transmission of this infection continues to show an increase until Mei 2021 the cumulative cases are 518 600 positive cases. The spread of this case has affected almost all sectors of health, economy and education. The spread of this virus not only occurs in Malaysia but all over the world involving, millions of cases and deaths (Mohamed et al., 2020). The WHO has declared COVID-19 a pandemic and this decision has had a global impact on the entire country. Malaysia is no exception to view this case as a pandemic that needs to address when starting in March 2020, and the Malaysian Government has decided to implement a movement control order (MCO). MCO refers to the Malaysian Government's preventive action against

the COVID-19 pandemic case, which requires residents to quarantine themselves at home. The MCO that has implemented in Malaysia has started in March until May 2020 and then continued with the Conditional Movement Control Order (CMCO) until June 2020 (National Security Council, 2020). During the MCO and CMCO implementation period, all school, college and university educational institutions were closed, and online learning instructions to implement. On 15 July 2020, educational institutions reopened following the COVID-19 case in Malaysia, showing a declining pattern with daily report cases being below 10 cases. Currently, Malaysians have begun to accept new norms by implementing recommendations from the Ministry of Health Malaysia to curb the spread of the virus.

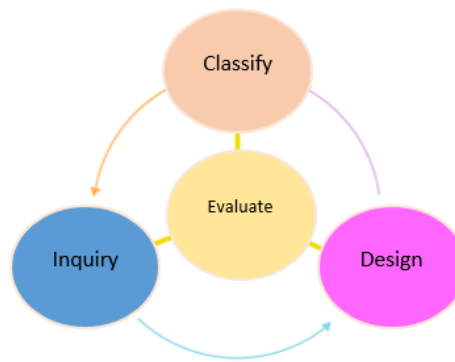
However, in early November 2020, the school session, which expects to end in mid-December, had to be closed again due to the increasing number of COVID-19 positive cases. This situation continues until March 2021. The implementation of MCO and CMCO has led to the closure of all educational institutions, including 87 Vocational Colleges throughout Malaysia. This situation is also happening all over the world and worries the education system. This situation not only raises concerns for teachers and students, but it also includes health and economic problems that are still unclear in the future that sees emergency remote teaching and educational technology as essential services (Williamson, Eynon & Potter, 2020). According to a report by UNESCO, it found that 90% of the world's student population has been affected by the pandemic (UNESCO, 2020). As in other countries, Malaysia is no exception with the implementation of emergency remote teaching (ERT) which implements online such as google classroom, google meet, WhatsApp, telegram and other multimedia applications. The use of digital technology is part of the practice of education is not a new thing or something extraordinary when the world is facing a pandemic because distance education has long used in the education system (Green, Burrow & Carvalho, 2020). Online teaching has described as the flexibility of the teaching and learning process anytime and anywhere (Hodges, Moore, Lockee, Trust & Bond, 2020). In this situation, Vocational College (KV) is no exception in implementing the policy set by the Ministry of Education Malaysia to carry out the curriculum delivery process online. Therefore, this study was carried out to identify the challenges faced by KV lecturers in implementing ERT and the pedagogy required for this implementation.

## 2. Emergency Remote Teaching

Emergency remote teaching (ERT) can describe as a temporary transition of instructional delivery to alternative delivery modes following crises (Hodges et al., 2020). Its means that ERT aims to complete the teaching process thoroughly for emergency purposes. This opinion is in line with the study of Hodges et al. (2020) stating ERT It involves the use of fully remote teaching solutions for instruction or education that would otherwise be delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated. According to a report by UNESCO nearly 1.5 billion students from 165 countries have affected by the closure and blockade of schools and campuses. This situation urges schools, colleges and universities to conduct online learning to meet curriculum needs (Osman, 2020). These closure and restriction instructions also involve Malaysia where all educational institutions must comply with the closure instructions. Malaysian Vocational College as an institution that offers technical and vocational education (TVET) programs are also involved. According to Bacow (2020) to curb the spread of the COVID-19 pandemic, extraordinary preventive measures should take by institutions of higher learning that will change curriculum delivery techniques.

According to Hodges et al. (2020), the main objective of ERT in this emergency is not to design a robust education system but to provide temporary access to teaching staff and students for emergency or crisis purposes. Therefore, online learning is seen as very suitable to implement when the pandemic hits the world. However, online teaching has seen as a challenge due to the lack of preparation among educators. Starting in March when Malaysia implemented the MCO, the teaching and learning process is still going on in the uncertainty of information and preparation. In early November 2020, the Ministry of Education Malaysia introduced a home teaching and learning manual that can be used by teachers in Malaysia as a guideline for the implementation of teaching and learning. Among the approaches in teaching and learning at home online occur when there are internet access and the use of devices that allow students to learn in real-time. The instructors are recommended to conduct learning such as Digital Educational Learning Initiative Malaysia (DELIMa), Cikgootube, EduWebTV, Google Meet, Microsoft Teams, e-games, videos, video clips, e-books, recordings or online assignments (Ministry of Education, 2020). In the implementation guidelines of KV teaching and learning in the new norms have introduced synchronous methods and asynchronous methods which have detailed online teaching and learning at home methods. Synchronous methods can describe as teaching activities that take place in real-time. Instructors and students can communicate and meet virtually at the same time, even when in different locations. At the same time, the Asynchronous method is a lesson that does not happen in real-time. Communication between teaching and students can take place at different times.

However, the implementation of teaching and learning at home still requires instructors to use the online platform, which is by remote teaching or better known as emergency remote teaching (ERT). In this unfinished pandemic situation, ERT is the best option as an available alternative. ERT requires a way of thinking of methods and modes of delivery that are appropriate to the limitations of existing resources that require the support and training of instructors. Distance education also requires a conducive environment and environment for effective teaching and learning (Eder, 2020).

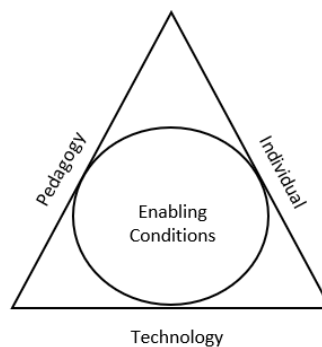


**Fig. 1- Emergency remote teaching environment framework**

Figure 1 shows the Emergency Remote Teaching Environment (ERTE) produced by Whittle, Tiwari, Yan and Williams (2020) to assist instructors in planning learning concepts in ERT mode. Based on the diagram above, it can explain that the ERT framework has three steps, namely inquiry, classifying available resources into constants and variables and design educational experiences. According to Whittle et al. (2020), these steps are nonlinear and iterative. This indicates that the crisis needs constant re-evaluation. The reality is that ERT requires instructors to adapt to the environment, resource shifts and unpredictable goals.

## 2.1 KV Lecturers' Perceptions of the Constraints of Implementing ERT

As professionals, teachers play important roles and responsibilities in the implementation of teaching programs (Tampang & Wonggo 2018). Educators are individuals whose role is to produce excellent and high-quality students. A good teacher is more than just an educator, the characteristics that make a teacher good are complex and extensive (Bullock, 2015). According to Anuar Ahmad and Nelson Jingga (2015) excellent and quality students are produced through an effective teaching and learning process. However, in the implementation of emergency remote teaching (ERT), some constraints have been identified as obstacles to curriculum delivery by vocational college lecturers. Lecturers in Vocational Colleges (KV) consist of two categories, namely lecturers who teach vocational fields and lecturers who teach academic fields. In the context of this study, research on the constraints faced by vocational college lecturers in conducting ERT will identify. To identify the lecturers' perceptions of the constraints faced in implementing ERT, a conceptual framework proposed by Ali, Uppal and Gulliver (2018) has been identified.



**Fig. 2 - TIPEC framework- structuring technological, individual, pedagogical barriers and enabling conditions (Ali et al., 2018)**

Figure 2 shows the TIPEC framework used to study lecturers' perceptions of barriers in emergency remote teaching. The framework outlines four obstacles, namely technology, individual, pedagogy and enabling condition. The lecturer's competence towards face-to-face classes is different from online. Thus, online learning has fundamentally changed critical processes in teaching such as the interaction between lecturers and students (Dinigrat, Nindya & Salwa, 2020). In the field of Technical and vocational education, practical skills become a priority in line with the requirements of the curriculum that focuses on practical skills. Vocational College is an institution that emphasises practical learning. This opinion supported by Ahmad Nabil (2016) in his study stated that teaching methods in Vocational Colleges are practical, which covers up to eighty percent (80%) of teaching in Vocational Colleges. This situation may cause problems for lecturers in Vocational Colleges when they must think of appropriate methods in curriculum delivery, especially in

conducting assessments of student practice. Therefore, a study to identify the constraints faced by vocational college lecturers in implementing ERT needs to be implemented.

## 2.2 KV Lecturers' Perceptions of Pedagogy Competencies

Technical and vocational education (TVET) is slightly different from regular education where TVET emphasizes skills, mastery of knowledge and competence. Curriculum delivery methods in vocational colleges also differ when practical skills are the primary assessment in the KV curriculum. Therefore, when the implementation of ERT online must be implemented due to this pandemic crisis will affect the emotions and pedagogical competencies of lecturers. Research in pedagogy has evolved over the past three years with various models and definitions that have used. However, in the field of pedagogical education can be described as a foundation of knowledge that is difficult to understand (Kind, 2009; Wooditch et al., 2018). Morrison and Lutteneger (2015) explains pedagogical content knowledge are an intermediary for teachers on pedagogical content knowledge and learning situations. Knowledge in pedagogy is not solely based on what teachers know about a lesson content but how they can use that knowledge spontaneously to teach (Beyer & Davis, 2011). Pedagogy is a teaching and learning process that is artistic and scientific in content delivery.

The teaching and learning process that takes place is through interaction between teachers and students, content and learning objectives. The teaching and learning process also requires teachers to apply strategies, methods, techniques and activities as a medium to facilitate students to accept and understand the content of the lessons presented. The success of the implementation of teaching and learning is influenced by the qualities found in individual teachers. Shulman (1986) has outlined that the knowledge available to a teacher, along with their method of delivery is the dominant integration in ensuring students receive dynamic and responsive learning. During the pandemic crisis of COVID-19, the pedagogical competencies of lecturers also changed when the learning process that has been in face-to-face interaction has shifted to online learning. This situation is seen as a new norm in the Malaysian education system. Educational technology, as well as pedagogical knowledge that has been learned, needs to be practiced at this time. Although some studies state that the teaching staff is stressed with this situation, but all lecturers implement ERT to meet the requirements of the curriculum. The main objective of this study was to identify the constraints and pedagogical competencies by lecturers in Malaysia's vocational colleges in implementing emergency remote teaching. Therefore, based on these objectives, there were four research questions developed as follows:

- i. What are the constraints faced by vocational college lecturers in implementing ERT?
- ii. What are the pedagogical competencies possessed by vocational college lecturers in implementing emergency remote teaching?
- iii. Are there differences between constraints and pedagogical competencies based on the categories of vocational and academic lecturers?
- iv. Are there any differences between pedagogical constraints and competencies based on the gender of male and female lecturers in implementing ERT?

## 3. Methodology

This study is an entirely quantitative study using a questionnaire as a research instrument. The design of this study focuses on a survey-based study where the questionnaire used is adapted from previous studies. For items identifying the constraints faced by vocational college lecturers in conducting ERT is adapted from the study of Diningrat et al., (2020) which also uses the TIPEC framework by Ali et al., (2018). For the item of pedagogical competence of lecturers in implementing ERT is adapted from the study of Bawane and Spector (2009). In this study, the study questionnaire was reviewed and confirmed by three experts in the relevant field. This pilot study involved 30 respondents from northern zone vocational colleges. As for the reliability of this instrument, it was shown that the value of Cronbach's Alpha coefficient was 0.87, which indicates that this questionnaire is consistent and has a high reliability. There are five ranges in instrument reliability where Hair et al. (2003) have outlined a reliability value equal to or greater than 0.7 can be used as a study instrument.

However, if it has a value equal to or less than 0.6 it is less appropriate and needs to be modified. To distribute the questionnaire, researchers have used Google Form instead of the questionnaire. While to disseminate this questionnaire, researchers have used an online medium. This situation is due to new norms in research that prevent researchers from self-distributing questionnaires due to the COVID-19 pandemic. In this study, the researchers used multiple-choice items and four-point scale items. Questions that use multiple-choice items consist of gender, KV zone on duty, length of service and category of the lecturer. While to analyse the data from the study respondents is to use a four-point scale item. A four-point scale was used where each scale is given a corresponding score value of 1 = Strongly Disagree, 2 = Disagree, 3 = Agree, 4 = Strongly Agree. The distribution of the questionnaire to be used is shown in Table 1.

**Table 1 - Study instrument**

Design of study		Instrument		Number of items
Quantitative	Questionnaire	Section A	Demography	4
		Section B	Constraint	22
		Section C	Pedagogical Competencies	14
Total				40

The data obtained were analysed using the SPSS software. The statistical method used in this study involves descriptive statistics consisting of frequency, percentage, mean, standard deviation and one-way ANOVA test. The data in this study were analysed using SPSS starting with the analysis of the demographic data of the respondents using frequency, percentage and crosstab analysis. At the same time, to identify the constraint factors faced by lecturers in conducting ERT using one-way ANOVA test. From the aspect of identifying the level of pedagogical competence of lecturers in implementing ERT also use mean and frequency analysis.

This study utilised a four-point scale to allow respondents to make answer choices. The scale in this study was modified according to the ranking of the mean so that the value shown is not too small. The mean ranking was made by taking the highest mean value and the lowest mean value. The highest mean value will be subtracted from the lowest mean value and ranked according to the suitability of the study (Mohd Najib, 2012).

Study population describes the overall position of everyone in a group to be studied. Meanwhile, the sample of a study is taken from the population; little or no sample to be taken depends on the type of study or methodology used. According to Creswell (2012), population is the group of people having one characteristic that distinguish them from other groups. Identifying the right method to select the study sample is important as the generalisation corresponds to the population. The total number of teaching staff in Vocational Colleges was approximately around 6,582 people (Zuhaili & Ramlee Mustapha, 2017). Krejcie and Morgan (1970) stated that the determination of a total study sample is based on the total population. Based on the table of Krejcie and Morgan (1970), the number of appropriate study sample for a population of approximately 7000 people is 364 people.

Therefore, this study used a total of 364 respondents consisting of vocational college lecturers throughout Malaysia as the study sample. The number of male lecturers who teach in the vocational stream is 99 people (27.2%) while the male lecturers who teach in the academic stream is 74 people (20.3%). The total number of male lecturers in this study was 173 people (47.5%). Meanwhile, the total number of female lecturers who teach in the vocational stream is 128 people (35.2%), and the academic stream is 63 people (17.3%). The results show that the total number of female lecturers in this study is 191 people (52.5%). In this study, 91 people (25%) from the northern zone KV, 82 people (23%) from the eastern zone KV, 76 people (21%) from the central zone KV, 74 people (20%) from the southern zone KV and 41 people (11%) from KV eastern Malaysia zone. Meanwhile, for the period of teaching experience, a total of 123 people (34%) has just served 1-7 years, 136 people (37%) have served for 8-16 years, 57 people (16%) have served 17 to 25 years, and 48 people (13%) have served for 26 years and above.

#### 4. Findings and Discussion

Table 3 shows the analysis of the constraints faced by lecturers in implementing ERT in vocational colleges. The analysis showed that 17 items of constraint were at a moderate level, while five items were at a high level of constraint. The constraint item that is at a high level is that the lecturer has a high level of agreement on the lack of feedback from students which is a mean of 3.41. This item represents the level of lecturer agreement of 90.6% equivalent to 330 respondents. The next constraint is the low student involvement when the implementation of online classes is to implement, which is a mean of 3.33. The level of agreement of respondents to this item is 320 respondents who are equivalent to 87.9%. The next item that has a high level of agreement on the constraints faced is a problem with low internet access which is a mean of 3.17 where the level of agreement of respondents to this item is 82.7% equivalent to 301 respondents. At the same time, the two items have the same mean of 3.01. The item is related to the constraints on the limited technological infrastructure where the level of respondents' agreement with this item is equivalent to 307 respondents which is equivalent to 84.3%. The next item that has a high level of agreement on constraints is related to course content that is not in line with ERT. This item represents the level of agreement of respondents of 275 people, equivalent to 75.5%. For other constraint items that are at a moderate mean level can be seen in Table 2 below

**Table 2 - Mean, standard deviation, frequency and level analysis findings for constraint items**

Constraints encountered	Mean	Std. Deviation	Level
Limited technological infrastructure.	3.01	.596	High
Confidence in technology is low.	2.42	.557	Intermediate
Limited access to digital libraries.	2.91	.660	Intermediate
Lack of ICT skills.	2.57	.748	Intermediate
No motivation to implement ERT.	2.41	.716	Intermediate
Lack of knowledge of operating ERT.	2.46	.644	Intermediate
No interest in operating ERT.	2.13	.613	Intermediate
Limited time to implement ERT.	2.54	.739	Intermediate
The cost of operating an ERT is high.	2.56	.696	Intermediate
I did not get support from the KV management.	2.01	.594	Intermediate
I have limited knowledge of online delivery methods.	2.46	.665	Intermediate
Course content that does not conform to ERT.	3.01	.733	High
I have a low-quality computer.	2.42	.686	Intermediate
The suitability of the technology to the course content is not parallel.	2.67	.674	Intermediate
There are no suitable instruments for online testing.	2.60	.722	Intermediate
There are no suitable assessments for online assignments.	2.50	.714	Intermediate
High multimedia costs.	2.62	.660	Intermediate
Virus attacks on multimedia equipment and computers used.	2.58	.673	Intermediate
Lack of feedback from students	3.41	.656	High
Low online student engagement.	3.33	.697	High
Online security issues.	2.77	.657	Intermediate
Low internet access.	3.17	.699	High
	2.66		Intermediate

Table 4 shows the mean analysis of the pedagogical competency items of vocational college lecturers when implementing ERT. The findings of the analysis showed that three items were at a high mean level, and 11 items had a moderate mean level. Items that are at a high level are lecturers can develop existing resources in implementing ERT that is ( $M = 3.07$ ,  $SD = 0.512$ ). The next item that is at a high mean level is that the lecturer can plan the learning outcomes of students ( $M = 3.02$ ,  $SD = 0.413$ ), the lecturer can help students by giving clear instructions that are ( $M = 3.01$ ,  $SD = 0.512$ ). For pedagogical competency items possessed by vocational college lecturers in implementing ERT are at a moderate level can be shown in detail in Table 3 below.

**Table 3 - Analysis of mean, std deviation and level the pedagogical competency**

Item	Mean	SD	Level
Identify student learning needs online.	2.84	.522	Intermediate
Provide useful teaching materials.	2.65	.568	Intermediate
Integrate resources while carrying out activities.	2.85	.483	Intermediate
Planning student learning outcomes.	3.02	.413	High
Expand existing resources in implementing ERT.	3.07	.512	High
Encourage social interaction in implementing ERT.	2.97	.432	Intermediate
Identify appropriate learning resources.	2.87	.457	Intermediate
Provide effective feedback.	2.74	.519	Intermediate
Assist students by giving clear instructions.	3.01	.525	High
Diversify learning activities when implementing ERT.	2.60	.619	Intermediate
Selecting appropriate learning resources.	2.82	.496	Intermediate
Enhance students' creativity and innovation through the implementation of ERT.	2.64	.593	Intermediate
Identify and organise learning content.	2.84	.452	Intermediate
Encourage students to participate and contribute when implementing ERT.	2.75	.529	Intermediate
	2.83		Intermediate

Table 4 shows the findings of the lecturer category analysis, which consists of vocational and academic fields on the constraint factors faced. The analysis of this study uses a one-way ANOVA statistical test that produces findings on SS (sum of squares) between groups with  $F$  value and means a score of the four dependent variables. Based on the table below shows that there is no significant difference in the constraint factor in implementing ERT between the categories of vocational lecturers and academic lecturers on three factors. For technological factors, the value of  $F = 0.588$  ( $p = 0.444$ ), the individual factor of the value of  $F = 0.593$  ( $p = 0.442$ ), the pedagogical factor of the value of  $F = 1.095$  ( $p = 0.296$ ), enabling conditions factor  $F = 0.089$  ( $p = 0.766$ ).

**Table 4 - Findings of lecturer category analysis on constraint factors**

Dependent variable		Sum of squares	df	Mean Square	F	p
Lecturer Category	Technology	.118	1	.118	.588	.444
1.Technical	Individual	.105	1	.105	.593	.442
2.Academic	Pedagogy	.205	1	.205	1.095	.296
	Enabling Conditions	.015	1	.015	.089	.766

\* $p > 0.5$

In the test of homogeneity of variances conducted the findings from Levene's statistic found that both groups of lecturer teaching field (1. Technical, 2. Academic) have uniformity variance  $p = 0.886$  that meets the variance requirement ( $p > 0.5$ ). These results allow data from both groups to be tested with One-Way ANOVA because the uniformity of variance that meets. Table 5 shows the findings for the value of SS (sum of square) between groups with the value of  $F = 0.987$  ( $p > 0.5$ ) which shows that the mean scores of the two groups do not differ significantly. These findings indicate that pedagogical competencies between the two categories of lecturers are not different.

**Table 5 - Findings of the One-Way ANOVA analysis of pedagogical competencies according to the category of lecturers**

	Sum of Squares	df	Mean Square	F	Sig
Between groups	.092	1	.092	.987	.321
Within Groups	33.823	362	.093		
Total	33.915	363			

Table 6 shows the findings of one-way ANOVA analysis of lecturer gender factors on constraints and pedagogical competencies of lecturers in implementing ERT. The findings of the study found that there are significant differences in the gender of vocational college lecturers in implementing ERT on technological constraint factor  $F = 0.113$  ( $p > 0.5$ ), individual factor  $F = 0.037$  ( $p > 0.5$ ), pedagogy factor  $F = 0.002$  ( $p > 0.5$ ), enabling conditions factor  $F = 0.392$  ( $p > 0.5$ ) and pedagogical competency  $F = 0.392$  ( $p > 0.5$ ).

**Table 6 - Findings of one-way ANOVA analysis of lecturer gender**

Dependent variable		Sum of Squares	df	Mean Square	F	Sig
Gender	Technology Factor	.023	1	.023	.113	.737
1.Male	Individual Factor	.007	1	.007	.037	.848
2.Female	Pedagogy Factor	.000	1	.000	.002	.967
	Enabling Conditions Factor	.001	1	.001	.004	.947
	Pedagogical Competency	.037	1	.037	.392	.532

\* $p > 0.5$

## 5. Discussion

This study to identify four objectives of the survey that analyse the constraints and pedagogical competencies possessed by vocational college lecturers in implementing the teaching process remotely due to emergencies. The results of the study found that four factors are constraints and obstacles for lecturers in conducting teaching and learning at home in ERT. These factors consist of technological factors, individual factors, pedagogy factors and enabling conditions factors. Data analysis found that the main factor that is a constraint to vocational college lecturers in implementing ERT is enabling conditions factor that involves constraints on low online student engagement and lack of feedback from students. The findings of this study are in line with Mohammed's research (2020), which states that educators and students will face difficult problems while engaging in online teaching and learning sessions at home. This opinion is also supported in the study of Dinigrat et al (2020) which stated that barriers in implementing online teaching during emergencies are related to lack of student involvement and lack of feedback. Whittle et al. (2020) said that educators found that student attendance declined during the move to remote teaching. This situation is seen as a failure in the involvement of students in applying distance learning. Students also face problems in getting immediate feedback from lecturers (Garrison & Arbaugh, 2007; Thurmond et al., 2002; Kay, 2006; Alven et al., 2013). Apart from that, the findings of the study found that vocational college lecturers also faced the issue of low internet access. However, other problems such as online security issues, virus attacks on multimedia and computer hardware are not significant constraints.

The next constraint factor is the technological factor that is the main thing in implementing ERT. The findings show that lecturers in vocational colleges face the problem of limited technology infrastructure as well as the opportunity to access limited digital libraries. Mohammed et al. (2020) argue that lecture recording will provide an opportunity for students who face problems in internet connection interruption, but the availability of quota/internet data to download material contributes to that factor. Educators are expected to have experience in producing web, blog and using movie maker, publisher or access software. In contrast, educators are only skilled in using regular software such as Microsoft, web email and others. The results of this study show that the opportunity for students to access technology is the cause of these factors. Problems in obtaining internet data have become a constraint in the implementation of ERT. Should as a developing country, the opportunity to access internet data needs to be expanded. However, from the technological aspect, vocational college lecturers have confidence in the use of technology and have skills in handling multimedia hardware. The use of multimedia is widely used vocational colleges helps in improving the skills of lecturers. These skills were found to be beneficial when this pandemic occurred, which prompted the implementation of ERT.

Next is related to pedagogical factors. Pedagogy is an important part of the education system. The findings of the study found that there was inappropriate course content in implementing ERT and technological suitability with inconsistent course content. The findings of this study are in line with the field of technical and vocational education in vocational colleges which emphasises practical. Although there are some suggestions and recommendations to implement practical teaching through video recording, the problem still exists. In a pandemic situation, the presence of a lecturer to make a video recording is tricky. For example, in the field of agriculture requires equipment that allows a practice to be implemented. Downloading videos from YouTube may be helpful but for students accessing videos is a difficult thing when it comes to internet and data access issues. Telles et al. (2020) stated that the production of video and adding audio to the power point turned out to be more difficult than conducting conventional lectures. Although ERT is implemented by making recordings, students still need online interaction (Mohammed et al., 2020). This view is supported by Uerz et al., (2020) who state that knowledge of the three technological, pedagogical and content factors is an interacting element. The use of technology for teaching and learning not only requires technology competencies on the part of teacher educators but also imposes demands on specific competences for pedagogical and educational use of technology. These professionals provided insights and practical expertise in online pedagogy and distance education solutions (Whittle et al., 2020). From other pedagogical aspects involves aspects of lecturers' knowledge of delivery methods, as well as inappropriate instruments and assessments conducted online. However, these three aspects are not a significant issue in pedagogical factors.

The last factor involves the individual the lecturer himself in implementing the ERT. The findings of the study show that this factor is not a big obstacle for lecturers in implementing ERT. Although the findings of the study are at a moderate level, the lecturers are seen to be motivated and responsible in implementing ERT. Apart from that, the KV management is very supportive of the lecturers in conducting online teaching sessions. This situation clearly shows that even in the face of this pandemic vocational college lecturers show interest in operating ERT. Hodges et al., 2020 stated that although the ERT situation during this pandemic is seen as pressure after the end of this pandemic, it is a good experience in implementing ERT.

In terms of lecturers' demographics in terms of lecturer category consists of vocational lecturers and academic lecturers. Through the statistical test one-way ANOVA found no difference between the categories of lecturers with three obstacle factors, namely technology, individual and pedagogy. The findings of this study show that vocational college lecturers have the same level of constraints in implementing ERT. However, there is a difference in enabling conditions factors. The findings of the study found that vocational lecturers were more impressed with the constraints. Items that found a high level of agreement from vocational lecturers were related to the lack of feedback and low student engagement. This situation may be because teaching in vocational fields takes more time than academics. Vocational lecturers have more credit hour meetings for a course for each program.



Next is a discussion related to the pedagogical competencies of vocational college lecturers in implementing ERT. The analysis of the study found that the level of pedagogical competence of lecturers in implementing ERT is at a moderate level. From the pedagogical aspect of vocational college lecturers, the lecturers are identified as able to expand the existing resources in implementing ERT. Besides, lecturers can plan student learning outcomes and are willing to help students by giving clear instructions. These findings are in line with the study of Duncan, Ricketts, Peake & Uessler (2006) who stated that in vocational education, lecturers should help students by understanding learning style through learning. Lecturers should have a deeper understanding of the obstacles encountered when conducting online teaching during the COVID-19 pandemic. Dinningrat et al. (2020) suggested that policymakers should understand the methods of supporting lecturers in implementing online teaching better. In terms of curriculum delivery, lecturers should have clear goals by using existing resources when implementing ERT. Green et al, (2020) in their study, suggested lecturers always to be prepared with lecture materials and identify important content in a course in meeting the needs of students when this pandemic occurs. Professional development opportunities should be offered to faculty related to pedagogical knowledge to help them adapt techniques that will promote active student learning (Blickenstaf, Wolf & Faltz, 2015).

## 6. Conclusion and Recommendation

This study aims to explore the perceptions of Malaysian vocational college lecturers on the constraints and pedagogical competencies possessed while implementing ERT. In terms of barriers faced by lecturers are in terms of lack of feedback from students, low online student engagement, low internet access, limited technology infrastructure and inappropriate course content. The results of the study analysis also found that there are significant differences between gender factors with technology, individual, pedagogy and enabling conditions. This study also found that lecturers in the vocational stream are more impressed with the delivery of the curriculum as the learning outcomes at KV are more geared towards areas of skills that emphasise practicality. Besides, lecturers should be allowed to participate in relevant courses to improve pedagogical competencies. Overall, from the pedagogical aspect of the lecturers are at a moderate level. The findings show that KV lecturers are not prepared in terms of useful teaching materials, do not know the appropriate learning activities, choose learning resources and increase the creativity and innovation of students through the implementation of ERT. These findings are in line with the recommendations of the parties involved in organizing related courses to improve the pedagogical competencies of Vocational College lecturers. This study is quantitative that uses questionnaire as research instruments. It is hoped that future studies will be able to use the interview method and make observations to deepen this problem further. Besides, an ERT framework that is more focused on technical and vocational education can be produced.

### Acknowledgements

We would like to acknowledge the support of Scholarship and Finance, Ministry of Education Malaysia under HLP 2019-2022. We would also like to express my gratitude to the Universiti Teknologi Malaysia (UTM Fundamental Research-UTMFR 21H02) and all the Vocational College Lecturers who are willing to participate in this study.

### References

- Ahmad Nabil (2016). *Kerangka pengajaran amali kursus teknologi elektronik di Kolej Vokasional Malaysia* (Unpublished doctoral dissertation) [Electrical technology practical teaching framework at Malaysia Vocational Colleges]. Universiti Teknologi Malaysia.
- Ali, S., Uppal, M. A., & Gulliver, S. R. (2018). A conceptual framework highlighting e-learning implementation barriers. *Information Technology and People*, 31(1), 156-180. <https://doi.org/10.1108/ITP-10-2016-0246>.
- Anuar, A., & Nelson, J. (2015). Pengaruh kompetensi kemahiran guru dalam pengajaran terhadap pencapaian akademik pelajar dalam mata pelajaran sejarah [Teacher competency impact in teaching towards academic achievement]. *Jurnal Kurikulum dan Pengajaran Asia Pasifik*, 3(2)
- Arnold, S. D. (2014). Assessing student learning online: Overcoming reliability issues. In D. Sampson, D. Ifenthaler, J. M. Spector, & P. Isaias (Eds.). *Digital systems for open access to formal and informal learning*. Switzerland: Springer, pp. 83-100. [https://doi.org/10.1007/978-3-319-02264-2\\_7](https://doi.org/10.1007/978-3-319-02264-2_7).
- Bacow, L. (2020). COVID-19–Moving classes online, other updates. [Community Message]. Harvard University, Nov 25. <https://www.harvard.edu/COVID-19-moving-classes-onlineother-updates>
- Bawane, J., & Spector, J. M. (2009). Prioritization of online instructor roles: Implications for competency-based teacher education programs. *Distance Education*, 30(3), 383-397. <https://doi.org/10.1080/01587910903236536>.
- Bennett, S., & Lockyer, L. (2006). Becoming an online teacher: Adapting to a changed environment for teaching and learning in higher education. *Educational Media International*, 41(3), 231-244.

- Beyer, C. J., & Davis, E. A. (2012). Learning to critique and adapt science curriculum materials: Examining the development of preservice elementary teachers' pedagogical content knowledge. *Science Education*, 96(1), 130-157.
- Blickenstaff, M. S, Wolf, J. K, Falk, M. J, & Foltz, C. J. (2015). College of agriculture faculty perceptions of student's skills, faculty competence in teaching areas and barriers to improving teaching. *NACTA Journal*, 59(3), 219-226
- Bozkurt, A., & Sharma, C.R. (2020). Emergency remote teaching in a time of global crisis due to Coronavirus pandemic. *Asian Journal of Distance Education*. 15(1), 1-5. <https://doi.org/10.5281/zenodo.3778083>
- Bozkurt, A., Jung, I., Xiao, J., Vladimirschi, V., Schuwer, R., Egorov, G., et al. (2020). A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*, 15(1), 1-126. Retrieved from <http://www.asianjde.org/ojs/index.php/AsianJDE/article/view/462>
- Bullock, M. (2015). What makes a good teacher? Exploring student and teacher beliefs on good teaching. *Rising Tide*, 7(1), 1-30.
- Chua, Y. P. (2014). *Kaedah dan statistik penyelidikan Buku 1 kaedah penyelidikan* [Research methods and statistics book 1 research methods] (2nd ed.). Mc Graw Hill Education.
- Cohen. J. (1998). *Statistical Power Analysis for Behavioural Science*. New Jersey: Erlbaum.
- Creswell, J. W. (2012). *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, 4th edition, Merrill.
- Darusalam, G., & Hussin, S. (2021). *Metodologi penyelidikan dalam pendidikan* [Research methodology in education] (3rd ed.). Penerbit Universiti Malaya.
- Diningrat, S.W.M., Nindya, M.A., & Salwa. (2020). Emergency online teaching: Early Childhood education lecturers' perception of barrier and pedagogical competency. *Cakrawala Pendidikan*, 39(3), 705-719.
- Duncan, D. W., Ricketts, J. C., Peake, J. B., & Uessler, J. (2006). Teacher preparation and in-service needs of Georgia agriculture teachers. *Journal of Agricultural Education*, 24-35. <https://doi.org/10.5032/jae.2006.02024>
- Eder, R. (2020) The remoteness of remote learning. *Journal of Interdisciplinary Studies in Education*,9(1), 168-171.
- Garrison, D. R., & Arbaugh, J. B. (2007). Researching the community of inquiry framework: Review, issues, and future directions. *The Internet and higher education*, 10(3), 157-172. <https://doi.org/10.1016/j.iheduc.2007.04.001>
- George, D., & Mallery. M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference*. Boston: Pearson.
- Green, J. K., Burrow, M. S. & Carvalho, L. (2020). Designing for Transition: Supporting Teachers and Students Cope with Emergency Remote Education. *Postdigit Sci Educ* 2, 906-922 <https://doi.org/10.1007/s42438-020-00185-6>
- Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020, 27 March). The difference between emergency remote teaching and online learning. *Educause Review*. <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>
- Kementerian Pendidikan Malaysia (2020). *Manual pengajaran dan pembelajaran di rumah (PdPR)* [Manual of teaching and learning at home]. Putrajaya, Malaysia: Kementerian Pendidikan Malaysia.
- Kind, V. (2009). Pedagogical content knowledge in science education: Potential and perspectives for progress. *Studies in Science Education*, 45(2), 169-204. <https://doi.org/10.1080/03057260903142285>
- Krejcie, R.V., & Morgan, D.W., (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*.
- Liguori, E. Winkler, C. (2020) From offline to online: Challenges and opportunities for entrepreneurship education following the COVID-19 pandemic. *Entrepreneurship Education and Pedagogy*,3(4) 346-351.
- Mercader, C., & Gairin, J. (2020). University teachers' perception of barriers to the use of digital technologies: The importance of the academic discipline. *International Journal of Educational Technology in Higher Education*, 17(1), 1-14. <https://doi.org/10.1186/s41239-020-0182-x>.
- Mohd Najib, A. G. (2012) *Reka bentuk tinjauan soal selidik Pendidikan*. Edisi Ketiga [Questionnaire design]. *Skudai: Penerbit Universiti Teknologi Malaysia*.
- Mohammed, A. O., Khidhir, B. A., Nazeer, A. (2020). Emergency remote teaching during coronavirus pandemic: The current trend and future directive at Middle East College Oman. *Innovative Infrastructure Salutations*, 5(3), 1-11.

- Mohamed, A. K., Salaeh, A., Halim, A. A., & Omar, S. A. T. S. (2020). Kesan COVID-19 Terhadap Kebolehpasaran Graduan IPT [COVID-19 impact on graduate's employability]: Pelan Tindakan Kepada Pelajar Fakulti Pengajian Quran & Sunnah, USIM.
- Morrison, A. D., & Luttenegger, K. C. (2015). Measuring pedagogical content knowledge using multiple points of data. *The Qualitative Report*, 20(6), 798-809.
- Osman, M. E. (2020). Global impact of COVID-19 on education systems: The emergency remote teaching at Sultan Qaboos University. *Journal of Education for Teaching* 46(4), 463-471. <http://doi.org/10.1080/02607476.2020.1802583>
- Pallant, J. (2010). SPSS Survival Manual: A step by step guide to data analysis using SPSS. *Journal of Advanced Nursing* 3, 352.
- Reich, J., Buttimer, C. J., Fang, A., Hillaire, G., Hirsch, K., Larke, L. R., ... & Slama, R. (2020). Remote learning guidance from state education agencies during the COVID-19 pandemic: A first look.
- Shulman, L. (1986). Those who understand: Knowledge growth in teaching. *Educational Researcher*, 15(2), 4-14.
- Srichanyachon, N. (2014). The barriers and needs of online learners. *Turkish Online Journal of Distance Education*, 15(3), 50-59. <https://doi.org/10.17718/tojde.08799>.
- Tampang, B. L. L., & Wonggo, D. (2018). Teacher professionalism in technical and vocational education. In *IOP Conference Series: Materials Science and Engineering* 306 (1). <https://doi.org/10.1088/1757899X/306/1/012017>
- Telles, L. E., Valenca, A. M., Barros, A. J., & da Silva, A. G. (2020). Domestic violence in the COVID-19 pandemic: a forensic psychiatric perspective. *Brazilian Journal of Psychiatry*, 43(3), 233-234.
- Uerz, D., Volman, M., & Kral, M. (2018). Teacher educators' competences in fostering student teachers' proficiency in teaching and learning with technology: An overview of relevant research literature. *Teaching and Teacher Education*, 70, 12-23. <https://doi.org/10.1016/j.tate.2017.11.005>
- UNESCO. (2020, 24 March). COVID-19 Educational disruption and response. *UNESCO Building Peace in the Minds of Men and Women*. <https://en.unesco.org/covid19/educationresponse>.
- Whittle, C., Tiwari, S., Yan, S., & Williams, J. (2020). Emergency remote teaching environment: A conceptual framework for responsive online teaching in crises. *Information and Learning Sciences*, 121(5/6), 311-319.
- Williamson, B., Eynon, R., & Potter, J. (2020). Pandemic politics, pedagogies and practices: Digital technologies and distance education during the coronavirus emergency. *Learning, Media and Technology*, 45(2), 107-114.
- Woodtich, M. A., Rice, H. A., Peake, B. J., & Rubenstein, D. E. (2018). The development of preservice agriculture teachers' pedagogical content knowledge through a greenhouse for teachers' course. *Journal of Agricultural Education*. 59(3), 1-14. <https://doi.org/10.5032/jae.2018.03001>
- Zuhaili, M. A. & Ramlee, M. (2017). Hubungan antara beban tugas dengan efikasi diri dan kepuasan kerja pensyarah di Kolej Vokasional [The relationship between task load, self-efficacy, and job satisfaction among teachers in vocational colleges]. *Sains Humanika* 9(1-15), 35-43. <https://doi.org/10.11113/sh.v9n1-5.1174>