Proceeding Paper

TPACK Readiness among English-Language Lecturers for Open Distance Learning (ODL) Adoption in a Malaysian Public University [†]

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Abstract: In the wake of the coronavirus disease 2019 (COVID-19) crisis, the education domain all around the globe suddenly shifted to online/open distance learning (ODL) platforms. Despite decades of technological advancement in the fabric of education, it is progressively important to understand English-language lecturers' technological pedagogical content knowledge (TPACK) readiness to adopt ODL. Generally, language-learning classes are conducted in the traditional physical setting. This is of great importance to investigate lecturers' ability to integrate technology into teaching and learning, as it is a significant factor that affects online learning success. This quantitative case study aims to explore the TPACK readiness of English-language lecturers in one public university in Malaysia. Based on the TPACK model, an online survey was designed and administered to collect data among 143 English-language lecturers during the movement control order. Despite an immediate compulsory ODL deployment, the results indicate that the English-language lecturers' TPACK readiness is progressive, and they are acquiescent and fairly receptive towards the ODL with efforts to overcome ODL challenges and stay positive. This, in turn, contributed to students' positive performance. It is hoped that such information can offer some insights for ensuring positive impacts in tertiary educational teaching and learning practice.

Keywords: COVID-19; English lecturers; open distance learning; self-efficacy; technological pedagogical content knowledge

1. Introduction

The outbreak of the COVID-19 pandemic has presented unprecedented challenges to educational practices all around the world while severely crippling people's routines and devastating the worldwide economy. The sudden outbreak left many teachers, academicians, and lecturers with no choice but to hastily accept, embrace, and adopt online/open distance learning (ODL) as the solitary method for teaching and learning. English-language lecturers who previously enjoyed and engaged in face-to-face (F2F) interactions like other language classes generally had to move with the tide. On 18 March 2020, the Malaysian government issued an initiative in the form of the movement control order (MCO) to prevent the spread of the outbreak in the nation [1]. In response to the MCO, which closed down retail and stunted the economy, the F2F interactions in schools and higher education institutions were suspended, and teachers were instructed that all these educational practices and activities to be conducted online.

More than half of the education population worldwide has been adversely affected by this sudden technological transition [2], and the COVID-19 pandemic propelled the

whole world into unexpected online teaching and learning (T&L) dramatically. The transition from F2F to a heavily relied-on technology was no longer a matter of choice but rather imposed and the only viable alternative for future education. Thus, the teachers, lecturers, and educators alike needed to abruptly adapt, adopt, and equip themselves with information and communication technology (ICT) literacy to conduct classes through ODL. ICT application in higher education has remained a major concern at the global level for decades [3]. The shift from traditionally proposed lessons is now revolutionised to accommodate the new online approach. The day's main course is no longer facilitated by solely the beliefs and skills of English-language lecturers on T&L before but also includes unique online student responses, learner–instructor relationships, online dynamics and management, and suitable online teaching approaches on top of the online T&L activities. This has become a critical factor in meeting the needs of the learner [4] as well as ensuring the online learning process is still as exciting and motivational as the F2F [3] and continues to be a significant predictor of the learners' academic accomplishment [5].

Implementing effective ODL is vital to ensure the attainment of educational and institutional goals in a higher education setting. The emergency ODL has varied challenges for both the lecturers and the learners alike. Emergency ODL implementation posed a myriad of challenges such as lack of online technologies exposure, adequate facilities, online resources, and limited technological knowledge in utilising the appropriate educational technologies available, which may affect the learners' learning process [6]. Many previous studies on online learning touched on ever so many dimensions such as readiness, pedagogy, technology, support, faculty, ethics, planning, evaluation, management, and institution [7]. Online learning readiness is considered one of the essential dimensions being studied.

Past research has indicated that learners usually show better academic performance online than in traditional settings [8]. However, the same cannot be said for lecturers. Lecturers' digital proficiencies are found to be inadequate and more so in the lesson plan formulation [9] even when, in the normal sense, they are digitally literate and can conduct online classes but are concomitantly unsuccessful at delivering online content efficiently [10]. In the same context, this certainly raises the need to evaluate lecturers' technological abilities to remain successful pedagogically in the ODL setting.

TPACK model is regarded as a useful framework for describing and understanding the goals for technology use in the T&L delivery. Technology competency encompasses all critical components, including technological and pedagogical, content knowledge, skills, and attitudes [11]. Previous studies have evaluated lecturers' technological competencies focusing on their knowledge, beliefs, and adaptation [12] and investigated the technological competency regarding other TPACK determinants in various countries [13–15]. It is believed that to deliver effective instructions, English-language lecturers must acquire sufficient technological competency. Hence, this study focuses on examining the English-language lecturers' TPACK readiness for ODL adoption.

Several works of literature have examined how English as a second language (ESL) university lecturers adopted, adapted, endured, and persisted with the ODL delivery of lessons. However, only several studies have surfaced in the context of Malaysian university language lecturers. This study was designed to investigate the English language lecturers' readiness on the related technology competency via the TPACK perspective for online T&L delivery during the COVID-19 pandemic. The results of this study are estimated to contribute to understanding these university lecturers' acquired ICT literacy to deliver effective ODL and provide some insight for others to emulate. The English-language lecturers were considered for the following research questions:

1. What are the levels of TPACK of faculty members (English-language lecturers) in three southern region branches of a public university in Malaysia?

2. Is there any significant difference between faculty members' TPACK and their age and/or teaching experience?

2. Literature Review

The transition of F2F education to ODL delivery fundamentally concerns the teaching practices and administrative support central to sustaining important student engagement [4]. This phenomenon is rooted in the subject discipline and the learner characteristics with different teaching approaches and learning resources. What is almost seamlessly accomplished during the F2F setting needs careful consideration when carried out in ODL. It requires the lecturers to be adept at the available technologies, which may have been uncommon in their practice. From a common perspective, the shift from F2F to ODL is not without challenges. Far from enjoying a smooth transition, the shift from F2F to ODL, which can be attested from the various studies, was perceived as aggressive, disastrous, disruptive, and unwelcome to certain quarters [16]. Nonetheless, by understanding the challenges or unwillingness of lecturers, this study hoped better to assist the lecturers in the technology-supported pedagogical activities because they are vital to supporting and establishing change within the educational process [17].

2.1. Technological Pedagogical Content Knowledge (TPACK) Model

The technological pedagogical content knowledge model (TPACK) model is a valuable framework for encapsulating today's lecturers' knowledge and skill demands. It is used to explore the lecturers' effective teaching practices in a digital setting. Mishra and Koehler's TPACK framework reiterates that effective instructors have the subject knowledge, adequate teaching skills, and technology capabilities to assist their students in achieving learning goals. TPACK is seen as a framework for measuring and enhancing teachers' knowledge of integrating technology into learning and instructing processes, which adds relationship and complexity to fundamental teaching knowledge [18].

The TPACK model has been constructed in the education domain regarding the central focus of an educator's knowledge on pedagogy, content, and technology for effective teaching [19]. Pedagogical knowledge (PK) relates to the lecturers' knowledge of teaching and learning methods, practices, and strategies. Content knowledge (CK) involves the lecturers' knowledge of the subject matter, while technological knowledge (TK) involves the lecturers' knowledge of modern information, communication technology, and the Internet. In addition, the integration between pedagogy and content knowledge creates an overlapping area of pedagogical content knowledge (PCK) on the idea of strategies for teaching specific content. Integrating pedagogy and technology knowledge forms technological pedagogical knowledge (TPK). This is about the technology that supports pedagogical goals. The content and technology knowledge overlap with technological content knowledge (TCK), referring to the transformation of the subject matter through technology. Lastly, the integrated knowledge of pedagogy, content, and technology, including the PCK, TPK, and TCK, is formalised as technological pedagogical content knowledge (TPACK). Within the TPACK context, the lecturers understand the use of related technologies in effectively delivering effective content for attaining different pedagogical goals. Most of the general technology integration studies from the TPACK perspective have been carried out regarding the F2F learning setting [18]. Indeed, it is exciting and perhaps insightful to examine the technology integration and readiness involving English-language lecturers in the ODL context.

2.2. Self-Efficacy

Self-efficacy is considered an effective tool to predict the behaviours of individuals in performing specific tasks. It concerns how a person views his abilities and capabilities through self-reflection, internalisation, and actions. The self-efficacy theory suggests that the uncertainty or the lack of competency in oneself within his environment can transform into resistance to change [20]. An individual who performs at high levels has high self-efficacy and engages and participates more willingly than a low self-efficacy individual [20]. High self-efficacy individuals are ready to put in more exertion as necessary to fulfil a task and spend valuable time working out challenges.

Concerning this study, self-efficacy is viewed as a belief in the English-language lecturers' context reflected in their readiness and confidence in their professional capability to deliver educational activities using the appropriate technological tools, which will be an influential factor in the achievement of the educational outcomes. Knowledge of technology increases the self-efficacy of language lecturers about technology integration, and such readiness and belief are important to impact or impede the lecturers' ability to create an effective technology-friendly learning environment [17,21–23].

The literature suggests that educators' self-belief in integrating technology effectively is a significant factor in determining its use and implementation in their teaching practice [24]. Even though self-efficacy of technology integration is seen as a credible indicator of the educators' ability and willingness to adopt technology, other research discoveries also showed that technology integration for impactful instructional activities remains among the greatest challenges facing educators of today [3,17,23,24]. As a result, there is a need to explore the relationship between the educators' self-efficacy relating to technology and their ability to use and integrate technology into their teaching practice effectively.

Lastly, the researchers consider self-efficacy as a significant controlling factor that affects the adjustment of an individual's behaviour and thinking. Furthermore, it is hoped that the development of professional self-efficacy is a promising way to stimulate and motivate educators to accomplish effective educational activities with the support of appropriate technology.

3. Methodology

This study employed a quantitative approach using a survey instrument in Google Form that was developed and distributed online. The data collection method used 5-point Likert scale items to measure the four self-efficacy constructs of "Technology Knowledge" (TK), "Technological Content Knowledge" (TCK), "Technological Pedagogical Knowledge" (TPK), and "Technological Pedagogical Content Knowledge" (TPACK). The instrument consisted of three demographic items (age, position, and years of teaching experience). The other four sections contained eleven items on the construct TK, five items on the construct TCK, ten items on the construct TPK, and seven items on the construct TPACK, with the 5-point scale being 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. These items were developed in the frame of "can do" statements in which self-efficacy is perceived as a capability.

This study intends to measure the readiness of English-language lecturers to implement ODL during the COVID-19 pandemic condition. A total of 143 English-language lecturers were involved, and they were from three branch campuses representing three different states in the southern regions. They have a varied online experience; some stated that this was their first exposure to online teaching, while some had some exposure to online teaching. The respondents' demographic is shown in Table 1.

A descriptor for each scale or the alpha (α) value is where an α value of >0.9 is considered excellent, an α value of >0.8 is considered strong, and α value of >0.7 is considered acceptable, and an α value of >0.6 is considered reasonable [25]. Cronbach's alpha coefficient value was used to evaluate the internal consistency reliability of all the TPACK constructs. Table 2 shows that the Cronbach or the coefficient value of each construct was greater than 0.8 or 80%, indicating a solid internal consistency and reliability.

Table 1. Respondent Demographics (n = 143).

Age	Frequency	Percentage (%)	Years of Teaching	Frequency	Percentage (%)
30 or younger	12	8.4	5 or less	26	18.2
31–40	76	53.1	6 to 10	46	32.2
41–50	42	29.4	11 to 15	34	23.8
51–60	13	9.1	16 to 20	19	13.3
			21 or more	18	12.6
Position					
Lecturer	62	43.4			
Senior Lecturer	76	53.1			
Associate Professor	5	3.5			

Table 2. Reliability evaluation.

Constructs	No. of Items	CA Value	M	SD
Technology Knowledge (TK)	11	0.921	3.54	0.65
Technological Content Knowledge (TCK)	5	0.878	3.89	0.53
Technological Pedagogical Knowledge (TPK)	10	0.927	3.91	0.58
Technological Pedagogical Content Knowledge (TPACK)	7	0.914	3.85	0.59

4. Results and Discussion

The survey instrument was intended to examine the English-language lecturers' readiness to adopt the ODL approach from the TPACK point of view. Various descriptive and inferential statistical tests were used to analyse the collected data. Based on the four (4) constructs of TPACK, the English-language lecturers scored the highest in the TPK dimension (M = 3.91 SD = 0.58), followed by TCK (M = 3.89, SD = 0.53), and followed by TPACK (M = 3.85, SD = 0.59). The lowest score is the TK (M = 3.57, SD = 0.65), indicating that their age is not a significant factor contributing to the limited exposure to technological knowledge, as their focus or area of expertise is on the English language. Since the Cronbach's alpha value on all the constructs of TPACK was larger than 0.80, implying that the scales had strong reliability, it is believed that the values of the descriptive and inferential statistics for the four constructs, as shown in Table 2, are reliable and valid.

It is safe to say that these educators have minimal issues with technology fundamentals that enhance teaching and learning delivery, thus showing a progressive level of TPACK readiness for ODL. Table 3, which involves the TPACK construct, indicates that these English-language lecturers can relate and profess to know about selecting, combining, strategising, and utilising the appropriate technology for enhancing their T&L delivery in ODL. They can select and choose the suitable technology to teach the students (M = 3.98, SD = 0.64). They also are able to strategise and combine (M = 3.95, SD = 0.67) both the technologies and teaching approach as well as appropriately teach a particular lesson using the combined technology and teaching approach (M = 3.88, SD = 0.70).

However, a point worth noting in Table 4 is that even though the TK construct is the lowest, there is still the belief by the English language lecturers that they can learn technology easily (M = 3.88, SD = 0.76), and they may possess the necessary knowledge in solving their technical problems (M = 3.78, SD = 0.80). This relates to operating online ODL technologies in delivering the teaching and learning content during the pandemic. At the same time, these English-language lecturers understand the need to keep abreast with the

new technologies being used or introduced in the environment (M = 3.76, SD = 0.77). This means that these lecturers are accommodating to the introduction of technologies into the T&L delivery.

Table 3. Statistics on Technological Pedagogical Content Knowledge (TPACK) construct for all respondents.

Items on Technological Pedagogical Content Knowledge (TPACK) Construct	M	SD
1. I can teach lessons that appropriately combine (the particular content), technologies and teaching approaches.	3.88	0.70
2. I can select technologies to use in my classroom that enhance what I teach, how I teach and what students learn.	3.98	0.64
3. I can use strategies that combine (the particular content), technologies and teaching approaches that I learned about in my coursework in my classroom.	3.95	0.67
4. I can display leadership in helping others to coordinate the use of (the particular content), technologies and teaching approaches at my school and/or district.	3.67	0.87
5. I can choose technologies that enhance the learning of (the particular content) for a lesson.	3.98	0.66
6. I can evaluate and select new information resources and technological innovations based on their appropriateness to specific tasks in (the particular content).	3.85	0.73
7. I can use (the particular content)-specific tools (e.g., software, simulation, environmental probes, graphing calculators, exploratory environments, Web tools) to support learning and research.	3.67	0.80

Table 4. Statistics on Technology Knowledge (TK) construct for all respondents.

Items on Technology Knowledge (TK) Construct	M	SD
1. I know how to solve my own technical problems.	3.78	0.80
2. I can learn technology easily.	3.88	0.76
3. I keep up with important new technologies.	3.76	0.77
4. I frequently play around the technology.	3.63	0.87
5. I know about a lot of different technologies.	3.34	0.94
6. I have the technical skills I need to use technology.	3.72	0.78
7. I have had sufficient opportunities to work with different technologies.	3.58	0.85
8. I can use technology tools to process data and report results.	3.72	0.84
9. I can use technology in the development of strategies for solving problems in the real world.	3.51	0.86
10. I have the ability to design web pages and use authoring software.	2.45	1.05
11. I understand the legal, ethical, cultural, and societal issues related to technology.	3.53	0.94

Meanwhile, the results in Table 5 show that the respondents in the age level of 31–40 scored the highest in all the TPACK constructs, i.e., TK (M = 3.69, SD = 0.58), TCK (M = 3.97, SD = 0.51), and TPK (M = 3.96, SD = 0.54) except TPACK. In the TPACK construct, the 13 respondents in the 51–60 age group scored the highest with M = 3.91 and SD = 0.52. This could mean that even though these very senior respondents are not that well-versed with the TK, with the lowest score of M = 3.25 and SD = 0.42, they can still relate to the technological inclusion in the other constructs (TCK, TPK, TPACK). In short, this could mean that they make up in the other areas where they lacked in TK and reach a balance.

Table 5. *t*-test Analysis by the age of Respondents on TK, TCK, TPK, and TPACK constructs (n = 143).

Technology Knowledge (TK)	N	M	SD
30 or younger	12	3.57	0.81
31–40	76	3.69	0.58
41–50	42	3.34	0.70
51–60	13	3.25	0.42
Technological Content Knowledge (TCK)	**N**	**M**	**SD**
30 or younger	12	3.96	0.51
31–40	76	3.97	0.51
41–50	42	3.78	0.55
51–60	13	3.70	0.60
Technological Pedagogical Knowledge (TPK)	**N**	**M**	**SD**
30 or younger	12	3.93	0.50
31–40	76	3.96	0.54
41–50	42	3.82	0.68
51–60	13	3.90	0.52
Technological Pedagogical Content Knowledge (TPACK)	**N**	**M**	**SD**
30 or younger	12	3.84	0.63
31–40	76	3.89	0.57
41–50	42	3.75	0.63
51–60	13	3.91	0.52

As Table 6 shows, the cumulative teaching experience or the years of teaching did not significantly influence the English-language lecturers' level of TK, TCK, TPK, and TPACK. However, the teaching experience had a significant bearing on the younger lecturers with 15 years or less of teaching experience. The lecturers with five or fewer years of teaching scored the highest (M = 3.72, SD = 0.70) in the TK construct. Again, the same group of lecturers scored the highest with M = 4.01 and SD = 0.58 in the TCK construct, while the lecturers with six to ten years of teaching scored the highest (M = 4.00, SD = 0.45) in the TPK construct. For the TPACK construct, the English-language lecturers attained the highest score with 11 to 15 years of teaching experience (M = 3.91, SD = 0.58). None of the English-language lecturers with the most years of teaching experience (16 to 20, 21, or more) achieved a high score in any of the constructs. This indicates that the years of teaching experience do not relate to technological knowledge and competency. This means that the more senior lecturers accept technology but are slightly unfamiliar if they are not exposed to or engage in technology.

Pearson's correlation was conducted to examine the relationship between other constructs and the TK and the lecturers' readiness to carry out the ODL activities effectively. The findings are shown in Table 7. Based on the Pearson's correlation figures, there was a significantly strong positive correlation between the lecturers' self-perceived TK and their PCK (rs (143) = 0.753, $p < 0.05$). This is followed by the second-highest score with a significantly positive correlation between the lecturers' self-perceived TK and TCK (rs (143) = 0.731, $p < 0.05$). The third-highest score with a significantly moderate positive relationship existed between lecturers' self-perceived TK and the TPK (rs (143) = 0.713, $p < 0.05$).

It is also beneficial to identify the construct that most significantly influenced the respondents' readiness to conduct ODL activities by conducting a multiple linear regression analysis. Table 8 shows the model of the summary. All of the independent constructs showed a mere 4.2% contribution that would influence these lecturers' readiness to be well-prepared to handle related language ODL activities. This value indicates that 4.2% of

the variance in "technology readiness and adoption" (self-efficacy) can be predicted from the TPACK constructs, but that does not mean the contribution was insignificant.

Table 6. *t*-test Analysis by Teaching Experience on TK, TCK, TPK, TPACK) constructs (n = 143).

Technology Knowledge (TK)	N	M	SD
5 or less	26	3.72	0.70
6–10	46	3.64	0.56
11–15	34	3.58	0.74
16–20	19	3.45	0.41
21 or more	18	3.05	0.61
Technology Content Knowledge (TCK)	**N**	**M**	**SD**
5 or less	26	4.01	0.58
6–10	46	3.93	0.38
11–15	34	3.98	0.50
16–20	19	3.83	0.37
21 or more	18	3.50	0.81
Technology Pedagogical Knowledge (TPK)	**N**	**M**	**SD**
5 or less	26	3.90	0.57
6–10	46	4.00	0.45
11–15	34	3.95	0.62
16–20	19	3.76	0.40
21 or more	18	3.77	0.89
Technology Pedagogical Content Knowledge (TPACK)	**N**	**M**	**SD**
5 or less	26	3.89	0.66
6–10	46	3.87	0.55
11–15	34	3.91	0.58
16–20	19	3.76	0.37
21 or more	18	3.70	0.79

Table 7. Correlation between the TCK, TPK, and TPCK Constructs and the TK Construct.

		TCK	TPK	TPCK
Technology Knowledge	Pearson Correlation	0.731 **	0.713 **	0.753 **
	Sig. (2-tailed)	0.000	0.000	0.000

** Correlation is significant at the 0.01 level (2-tailed).

Table 8. Test Significance of Multiple Linear Regression Model.

R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
0.206 [a]	0.42	0.036	0.52259	0.014

[a] Dependent Variable: Overall TPACK.

Lastly, a multiple correlation analysis was conducted between all the constructs in the TPACK model, which are the TK, TCK, TPK, and TPACK. The statistics in Table 9 indicates that the value ($F_{(1141)} = 6.228$, $p < 0.5$, $R2 = 0.42$) was significant at 0.05 level of significance. This indicated that the English-language lecturers' self-efficacy on TPACK constructs showed they are generally ready and on the right track for carrying out pedagogical activities through ODL.

Table 9. ANOVA for multiple correlations between TK, TCK, TPK, and TPACK.

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.701	1	1.701	6.228	0.014 [b]
Residual	38.507	141	0.273		
Total	40.208	142			

[b] Predictors: (Constant), Years of Teaching.

5. Limitation of Study

The study identified some limitations. Firstly, the English-language lecturers' responses on their technological competencies may be biased, as they were self-reported. It is useful for future studies to undertake different available approaches to discover and understand the lecturers' TPACK competencies. Secondly, this study concentrated only on the TPACK model to gauge the technological proficiencies of the English-language lecturers to understand their technological readiness and knowledge. Therefore, it is also significant to reinforce the findings of this study by assessing other indicators to examine the English language lecturers' competencies in their actual technology-supported teaching. Lastly, evaluating these lecturers' online technological, content, and pedagogical competencies is beneficial over time, as this study was carried out during the COVID-19 pandemic outbreak and the initial digital transition. Over time, changes may need to be observed; thus, a longitudinal study can be conducted to strengthen the findings further. Such a move can also provide an avenue critical to the elevation and enhancement of online instructional practices.

6. Conclusions

As the COVID-19 pandemic terrified the world, the education system worldwide was not spared from the pandemic's rage. The devastating virus suspended all the F2F interactions of educational institutions and forced the pedagogical practices online. However, this involuntary and unexpected move somehow affected the continuous delivery of F2F lessons. The shift to ODL is undoubtedly not without concerns and challenges, as many works of literature demonstrate. This quantitative study examined the impact of TPACK readiness on the English language lecturers' technology competencies to handle the ODL instructional activities. In today's technology advancement era, language lecturers must be competent in digital delivery and related technologies to ensure an engaging and uninterrupted lesson, albeit digitally. The findings showed that the level of TPACK readiness among English-language lectures is progressive, as they are becoming more willing and receptive to the ODL with efforts to overcome any ODL challenges and stay positive. It is also noted that age is not a barrier to the use of technology, as older lecturers can relate to the technology. The more senior lecturers also were not apprehensive about technology if they were exposed to it properly. The teaching experience years did not influence the rejection of technology, but it was the other way around, showing that these more senior lecturers are open and willing to technology with the proper exposure. Overall, the English-language lecturers are considered on the right track regarding their readiness and continued effort towards delivering their pedagogical activities on the ODL platform.

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