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Empowering Malaysian Academics: Crafting Online Learning Adaptation Guidelines

Nor Nashrah Azmi[1], Alawiyah Abd Wahab[2,*]

[1] Department of Foundation & Diploma Studies, College of Computing and Informatics, Universiti Tenaga Nasional (UNITEN), 43000 Kajang, Selangor, Malaysia
[2] School of Computing, Universiti Utara Malaysia, 06010 Sintok, Kedah, Malaysia

ABSTRACT

The worldwide COVID-19 pandemic posed an unparalleled challenge to the higher education sector, necessitating universities to rapidly shift towards improvisation and the widespread adoption of online learning. This transition, while unexpected, has catalysed a surge in innovations tailored to diverse educational needs. Surprisingly, there is a scarcity of recent empirical analyses focusing on the challenges of online learning, particularly from the perspective of educators themselves. In light of this, our study seeks to shed light on the unique challenges faced by Malaysian academics in adapting to online learning during the pandemic. Our objective extends beyond mere identification, as we endeavour to formulate comprehensive online learning guidelines tailored specifically to the Malaysian academic context. We gathered data from 173 academics teaching at public universities in Central Malaysia, employing a 73-item questionnaire distributed through various online platforms, including email, Facebook, WhatsApp, and LinkedIn. The results reveal a significant departure from earlier findings, as the identified challenges from previous research did not resonate with our respondents, with mean scores for each challenge falling below 3.0. This suggests that Malaysian academics have successfully navigated these challenges. In pursuit of our second objective, we crafted a set of online learning guidelines grounded in four critical components: 1) content knowledge, 2) material quality knowledge, 3) technological knowledge, and 4) technological accessibility and equality. These guidelines were formulated based on the insights gained from our questionnaire data and the Technological Pedagogical Content Knowledge (TPACK) Model. Our study contributes to the broader discourse on online learning during the pandemic by providing a nuanced understanding of the experiences and needs of Malaysian academics, ultimately equipping them with a robust framework to enhance their online teaching practices.

Keywords:

COVID-19; online learning challenges;
academic perspectives; transformation

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1. Introduction

The COVID-19 outbreak that started in China in December 2019 has rapidly spread worldwide. It is no longer a new concern and affects the entire world, including Malaysia. The first case in Malaysia was detected on January 24, 2020. Malaysia's government responded by implementing a Movement Control Order on March 18, 2020. This crisis has significantly impacted education, with the Ministry of Education and the Ministry of Higher Education working to ensure minimal disruption. Globally,

* *Corresponding author.*
E-mail address: alawiyah@uum.edu.my

schools and universities closed due to the pandemic, and students of all ages have transitioned to remote learning. Many universities worldwide have shifted to online teaching to adapt to the situation.

Amid the pandemic, online learning has gained prominence among learners as it harnesses technology to facilitate the acquisition of information and teaching processes [1]. However, the impact of online learning is far from uniform, varying significantly across different contexts, which adds a layer of complexity to the situation [2]. These variations manifest in a multitude of teaching and learning challenges, encompassing student attitudes, differences in available space and social interactions, time constraints for academics, academics' self-efficacy, and technical issues [3]. Furthermore, concerns extend to institutions and academics who harbour reservations about Malaysia's readiness to implement comprehensive online learning that caters to the needs of all students. These concerns are compounded by challenges faced by academics, which include adapting assignments to meet the new online learning requirements [4], dealing with variances in individual experiences influenced by factors like home environments [2], and navigating the depth of academics' experience with online learning technologies [5].

The existing body of literature on online learning has furnished substantial evidence regarding the impediments encountered in the successful adoption of online learning. These challenges and barriers predominantly revolve around issues such as student attitudes [3], disparities in spatial and social interactions [2], academic time constraints, academic self-efficacy, and technical issues [3]. However, it is important to note that there has been limited empirical analyses that specifically explore online learning challenges, particularly from the perspective of academics. Hence, the objectives of this study are twofold. Firstly, it aims to identify and gain insight into the challenges encountered by Malaysian academics during their transition to online learning amidst the COVID-19 pandemic. Secondly, the study endeavours to formulate comprehensive guidelines for Malaysian academics to effectively navigate and adapt to online learning.

The COVID-19 pandemic led to a surge in enthusiasm among academics and students for online learning, driven by the closure of educational institutions. Online learning platforms offer tools for information access and teaching, providing flexibility for extensive study and enabling education and training through digital means. The adoption of these platforms is recommended in Malaysian institutions to promote equity and reduce physical contact between students and educators. Moreover, the development of technology, particularly Internet services, allows students and academics to access and deliver up to 100% of educational content using personal devices. These tools and services cater to various learning needs, facilitating document sharing and regular assessments, both in virtual and physical classrooms. Examples of such tools include Microsoft Teams, Facebook Live, Google's G Suite, WebQuest, Youtube, Webex, Zoom, and popular chat applications like Whatsapp and Telegram.

Online learning brings about a multitude of advantages for countries, educational institutions, academics, and students. These advantages encompass the following key aspects: Firstly, it fosters an improvement in the quality of digital resources and technology, leading to a more enriched educational experience [6]. Secondly, it offers a greater degree of flexibility, allowing students to engage in self-regulated learning on their terms, determining what, where, when, and how they learn [7]. Thirdly, online learning empowers students to become self-directed learners. They can actively identify their learning needs, set objectives, and devise strategies to take control of their learning journey [7]. Lastly, it plays a crucial role in elevating the visibility of countries and institutions within the global education landscape. This is achieved through the development of new legislation, regulations, platforms, and innovative solutions for addressing future educational challenges. By

doing so, countries and governments can proactively prepare for a more resilient and adaptive education system [8].

Adapting to online learning poses challenges for governments, academic institutions, and individuals [9]. These challenges include: 1) the need for new rules, policies, and technologies [8], 2) inadequate infrastructure, especially in rural areas [10], 3) varying technology adaptation causing slow performance [7], 4) differences in learning environments [2], and 5) mental health concerns for students and academics [11]. Previous research highlights additional challenges for academics, such as designing and developing course materials, lack of quality standards, digital literacy issues, and digital accessibility disparities [12-15]. These online learning challenges for academics are the focus of this study.

1.1 Online Learning Frameworks

This section reviews conceptual frameworks that can be adapted to guide the development of online learning adaptation guidelines for Malaysia academics. Technological Pedagogical Content Knowledge (TPACK) model describes relations and interactions among content knowledge (subject matter), technical knowledge (computers, internet, digital video), and pedagogical knowledge (practices, procedures, teaching and learning methods) [16]. It aims to: 1) understand fundamental concepts of content, pedagogy, and technology, 2) comprehend dynamics in student-academic relationships, content, technology, activities, and resources, and 3) elucidate the dynamic connection between content, pedagogy, and technology knowledge and their application in teaching and learning [17-18].

The Community of Inquiry (COI) Model is designed to 1) assess academics' readiness to teach, perceived teaching presence, and teaching presence behaviour in blended and online learning environments, and 2) identify components for an ideal asynchronous, virtual higher education learning experience. Widely used in conceptualizing online learning environments, the COI Model asserts that effective knowledge construction in online settings requires more than direct guidance. The depth of knowledge construction hinges on academics and students fostering social presence, teaching presence, and cognitive presence. To achieve this, academics must intentionally select meaningful course materials, facilitate student interactions, and guide self-directed learning [19].

CAFÉ (Content Activities Facilitation Evaluation) serves as a foundational instructional design model with the following objectives: 1) aiding academics in transitioning traditional classes to "emergency remote teaching," 2) comprehending students' learning needs, available technology, and home learning tools from the academic perspective, and 3) guiding academics in creating learning materials by analysing student learning in a remote virtual environment. CAFÉ consists of four components: 1) content, involving the systematic organization of instructional material, 2) activities, encompassing organized learning efforts to achieve student learning goals, 3) facilitation, providing appropriate scaffolding, clear instructions, tools, and resources, and motivating students, and 4) evaluation, advocating the use of multiple data sources for a holistic analysis of student learning, recognizing the inherent challenges in evaluating online learning [20].

Upon reviewing these models, it becomes evident that none of the frameworks can singularly address all the challenges identified in the Online Learning and Adaptation Challenges section. Table 1 presents the applicability of each model to the identified challenges.

Table 1
The applicability of online learning frameworks to address the identified challenges

Challenges	TPACK Model	COI Model	CAFÉ Model
Designing and developing course materials	√	-	√
Lack of quality standards or management of online resource creation	-	-	-
Lack of ICT and digital illiteracy	√	-	-
Digital and internet accessibility and equality	√	-	-

The TPACK Model has limitations in addressing challenge two as it primarily defines relations and interactions within pedagogical knowledge, neglecting considerations of quality. In contrast, the COI Model does not explicitly address any challenges, but its focus on social presence, teaching presence, and cognitive presence can be integrated into the proposed guidelines for addressing challenges effectively. The CAFÉ model, while not addressing challenge four, has limitations in handling challenge two by directing academics in material creation without emphasizing quality and challenge three by not exploring diverse interactive tools and technologies for teaching. These observations suggest the need for comprehensive online learning guidelines tailored to address the identified challenges faced by academics.

2. Methodology

This study employs a quantitative method, utilizing a questionnaire designed in English to investigate the challenges experienced by academic respondents in online teaching during the pandemic. The questionnaire is structured into three sections: Section A covers user demographics and Information and Communications Technology (ICT) usage, using a five-point Frequent Scale [21-23]; Section B addresses online teaching challenges during the pandemic, with 28 items in four dimensions rated on a six-point Likert scale [7,24-25]; and Section C focuses on strategies adopted by Malaysian academics, with 28 items in four dimensions also rated on a six-point Likert scale [7]. The questionnaire design draws from challenges identified in the literature review phase, ensuring consistency with previous studies [26].

The questionnaire underwent evaluation and review by three experts using a simple evaluation form. This expert review serves as a cost-effective pretesting method, allowing for a fresh perspective on the questions, as authors may become too immersed in the subject matter. The three expert reviewers, each with an average of five years of experience in E-Learning and Information Systems at Universiti Utara Malaysia (UUM), provided valuable feedback during the pre-testing phase. The questionnaire was subsequently amended based on their inputs to ensure clarity and relevance, addressing any potential issues of ambiguity or unreasonableness.

After the pre-testing phase, a pilot study was conducted with 30 academics from various backgrounds at Universiti Tenaga Nasional, randomly selected from a similar population as the target users. The online-based questionnaire was shared through WhatsApp to facilitate responses. The pilot study results informed modifications to the questionnaire based on tester input, ensuring material validity. The reliability analysis of all eight dimensions in the research pilot study yielded Cronbach's alpha coefficients ranging from 0.867 to 0.964, indicating strong internal consistency and reliability, as values above 0.7 are considered tolerable [27]. The analysis of Section B and C questions confirmed their suitability and acceptable reliability, highlighting the overall consistency of the scale. Table 2 shows the Cronbach Alpha for the research instrument.

Table 2
Reliability of the research instrument

No	Dimension	Cronbach Alpha	Number of items
Online teaching challenges during the pandemic			
1.	Designing and developing course materials	0.916	7
2.	Lack of quality standards or management of online resources creation	0.913	7
3.	Lack of ICT skills or digital illiteracy	0.894	7
4.	Digital and Internet accessibility and equality	0.909	7
How to address the challenges of online teaching during the pandemic			
5.	Designing and developing course materials	0.945	7
6.	Lack of quality standards or management of online resources creation	0.964	7
7.	Lack of ICT skills or digital illiteracy	0.931	7
8.	Digital and Internet accessibility and equality	0.867	7

Data collection involved distributing a 73-item questionnaire utilizing Google Forms. The Google Form was disseminated through email, LinkedIn, and social media in mid-March 2021, with the questionnaire open for responses until the end of the month. The study employed purposive non-probability sampling, selecting teaching academics from public universities in Central Malaysia based on defined criteria, ensuring a purposeful selection rather than including anyone available.

3. Results

The analysis of the questionnaire was based on 173 responses gathered from academics at public universities in Central Malaysia (Selangor and Kuala Lumpur). The distribution of respondents is as follows: of 173 respondents, 31% are from Universiti Teknologi Mara (UiTM), 20% are from Universiti Islam Antarabangsa Malaysia (UIAM), 17% are from Universiti Kebangsaan Malaysia (UKM) and Universiti Putra Malaysia (UPM), 9% are from Universiti Malaya (UM), and a smaller proportion are from Universiti Pertahanan Nasional Malaysia (UPNM) and Universiti Teknologi Malaysia (UTM) Kuala Lumpur, as illustrated in Figure 1.

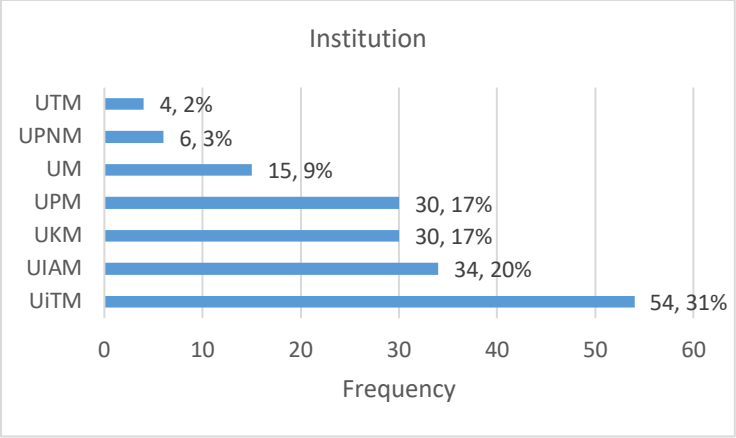


Fig. 1. The distribution of the respondents

Figure 2 depicts the distribution of participants' positions in this study, with 58% holding senior lecturer positions, 16% as associate professors, and 15% as lecturers. Professors account for 6%, and assistant lecturers constitute 2%.

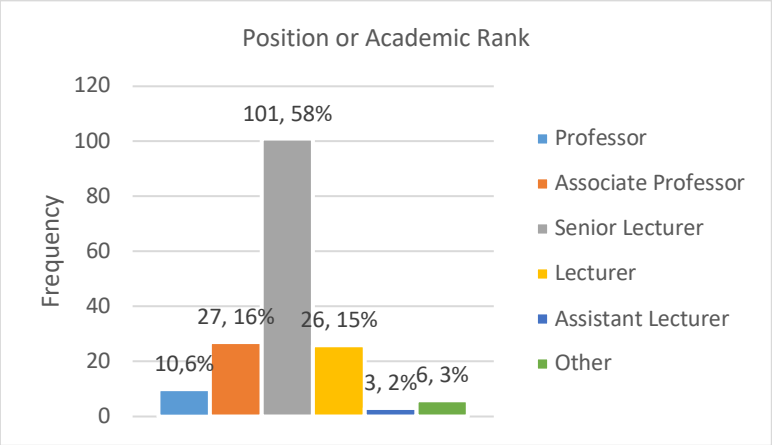


Fig. 2. Academic positions of the respondents

In Figure 3, female academics represent 64% (111), while male academics make up the remaining 36% (62).

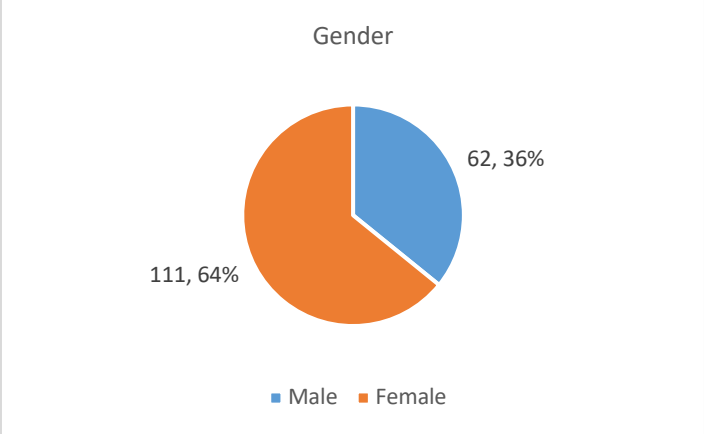


Fig. 3. Gender distribution of the respondents

Figure 4 reveals that the majority of participants fall within the 40–49 age group, comprising 40% (70) of respondents, followed by the 30–39 age group with 34% (58), and other age groups including 50–59 years old, 60 or older, and 20–29 years old.

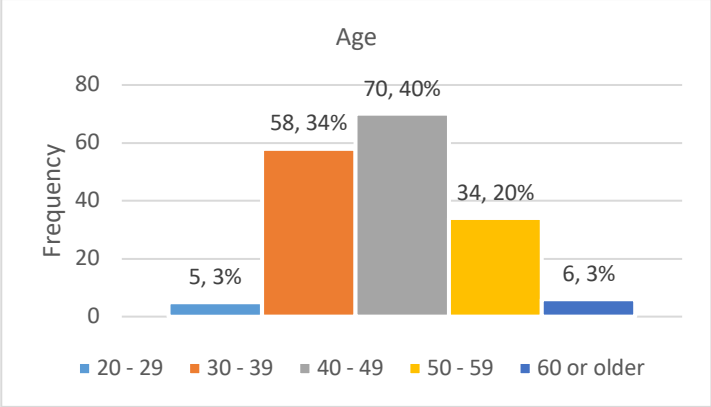


Fig. 4. Age distribution of the respondents

3.1 Online Learning Challenges

This survey aims to identify challenges and strategies employed by Malaysian academics in adapting to online learning during the pandemic. The research questions guiding this survey are: 1) What challenges do Malaysian academics face in adapting to online learning as a medium of educational instruction during the pandemic? and 2) How are Malaysian academics adapting to online learning based on the challenges encountered during the pandemic?

To address the first research objectives, descriptive statistics were employed to calculate participants' mean scores and standard deviations across the four dimension of online learning challenges. The composite mean scores for each dimension were calculated by summing the scores of all items within that dimension and then dividing by the number of items. As shown in Table 3, the composite mean scores for each dimension ranged from 2.48 to 2.78 on a 6-point Likert scale. These results highlight that the most challenging aspect of online learning, according to respondents, is designing and developing course materials (mean score of 2.78), followed by the lack of ICT skills or digital illiteracy (mean scores of 2.73). However, it is important to note that participants generally expressed disagreement that these four dimensions constituted significant online learning challenges, as the mean score for each challenge is below 3.0.

Table 3
The mean and standard deviation for the four-dimension challenges

No	Challenges	Mean	Std. deviation
Dimension: Designing and developing course materials		**2.78**	1.068
1.	I have inadequate time to develop and maintain course materials for online teaching.	3.26	1.465
2.	I have inadequate instructional design skills to develop course materials for online learning.	2.85	1.272
3.	I have inadequate pedagogical skills to develop course materials for online teaching.	2.82	1.276
4.	I have inadequate instructional design knowledge to develop course materials for online learning.	2.80	1.280
5.	I have inadequate knowledge of suitable assessments to be conducted online.	2.80	1.312
6.	I have inadequate knowledge in the utilization of existing online learning systems and tools to develop course materials.	2.61	1.237

7.	I have inadequate access to technology facilities to develop course materials for online teaching.	2.34	1.149
Dimension: Lack of ICT skills or digital illiteracy		**2.73**	1.158
1.	I feel that I need technical guidance in using technology to help me improve my pedagogy.	3.25	1.480
2.	I have inadequate time to learn new technology.	3.02	1.486
3.	I have inadequate knowledge of how to apply technology in teaching.	2.66	1.340
4.	I have a slow pace of implementation of online teaching.	2.64	1.406
5.	I find it difficult to keep up with technological changes.	2.59	1.376
6.	I feel self-intimidated by technology.	2.46	1.387
7.	I find it difficult to change from my current teaching practice to integrate ICT tools in teaching.	2.45	1.264
Dimension: Lack of quality standards or management of online resources creation		**2.65**	1.108
1.	I have inadequate knowledge of policy concerning intellectual property rights of creation and management of online resources.	2.91	1.307
2.	I have no role models to follow in quality standards of online resource creation.	2.73	1.338
3.	I have no role models to follow in quality standards of online resource management.	2.72	1.264
4.	I have inadequate online teaching training provided by the university regarding quality issues.	2.63	1.356
5.	I have inadequate knowledge of strategic planning for online teaching.	2.59	1.229
6.	I have inadequate knowledge of institutional policy for online teaching.	2.50	1.247
7.	I have inadequate knowledge of the shared vision for online teaching in my university.	2.50	1.223
Dimension: Digital and Internet accessibility and equality		**2.48**	1.075
1.	I have inadequate funding to access some online teaching tools.	3.01	1.529
2.	I have inadequate technical support in solving computer problems.	2.65	1.324
3.	I have inadequate access to software for online learning.	2.46	1.287
4.	I have inadequate access to online learning technologies.	2.42	1.303
5.	I have inadequate access to hardware for online learning.	2.36	1.307
6.	I have frequent technology failures.	2.32	1.160
7.	I have poor Internet access.	2.14	1.219

Scale: 6 = Strongly agree, 5 = Agree, 4 = Slightly agree, 3 = Slightly disagree, 2 = Disagree, 1 = Strongly disagree

3.2 Strategies Employed to Address the Challenges

Table 4 presents participants' mean scores and standard deviations for strategies addressing challenges across the four dimensions and their respective items. Composite mean scores for each dimension were calculated by summing the scores of all items in that dimension and then dividing by the number of items. The composite mean scores for items in the dimensions ranged from 3.23 to 5.08 on a 6-point Likert scale. On average, this indicates that respondents agreed that items for all four dimensions serve as effective strategies to address online learning challenges.

The highest composite mean score is for designing and developing course materials (4.53), while the lowest mean score is for digital and internet accessibility and equality (3.87). Participants expressed agreement that they employed numerous strategies to address challenges related to designing and developing course materials for online learning purposes. However, they slightly disagreed that they employ extensive strategies for challenges regarding digital and internet accessibility and equality. Notably, item number 1 in the designing and developing course materials dimension achieved a mean score of more than 5.0, indicating strong agreement among participants in providing students with supplemental course information as an effective strategy to address challenges in this dimension.

Table 4
The mean and standard deviation for the strategies to address the four-dimension challenges

No	Strategies to address the challenges	Mean	Std. Deviation
Dimension: Designing and developing course materials		4.53	0.866
1.	I provide students with supplemental course information such as course outlines, course objectives, concepts, and ideas.	5.08	1.012
2.	I select the simplest technology tools during course materials development, such as YouTube videos, to meet the course goals.	4.83	1.035
3.	I plan and review learning outcomes regularly to ensure clarity, utility, and appropriateness of course materials.	4.54	1.154
4.	I consider the various learning styles of students during course materials development.	4.44	1.148
5.	I made a lot of changes to my course materials in order to meet pedagogy and necessary curriculum reforms.	4.44	1.202
6.	I attended workshops or trainings on how to develop course materials and teach online classes.	4.37	1.295
7.	I refer to subject matter experts to evaluate my course materials.	3.86	1.444
Dimension: Lack of quality standards or management of online resources creation		4.44	0.981
1.	I ask my students to use certain tools to provide feedback regarding the course.	4.55	1.148
2.	I have the opportunity to use technology more innovatively to enhance course quality and develop new ideas.	4.54	1.118
3.	My university proposes an enhancement in existing guidelines regarding minimum standards for online course design, development, and delivery to ensure quality standards are met.	4.53	1.213
4.	I review course materials periodically to ensure course standards were met.	4.51	1.139
5.	I design courses with a consistent structure and easily discernible to students of varying learning styles.	4.37	1.111
6.	I receive guideline to develop templates, processes and systems to enhance the quality.	4.36	1.262
7.	I receive tools and strategies that meet the minimum quality standard in the training course.	4.33	1.206
Dimension: Lack of ICT skills or digital illiteracy		4.15	1.024
1.	I have personal motivation to use technology.	4.57	1.182
2.	I was exposed to a variety of possibilities for integrating ICT into online teaching during course development.	4.49	1.169
3.	I attended workshops or trainings to develop effective technology skills.	4.35	1.279

4.	The Teaching and Learning Centre (TLC) or related department helped colleagues when they encountered difficulties in ICT or technology issues.	4.34	1.318
5.	I allocated a specific time for online learning technology skills faculty training.	4.14	1.313
6.	There are peer mentoring resources available to academics in online teaching.	3.99	1.410
7.	I share my problems to a specific channel or website that acts as a place for sharing and consultation between the academics.	3.54	1.508
Dimension: Digital and Internet accessibility and equality		3.87	1.014
1.	I used multiple methods to have reliable access to the internet.	4.23	1.406
2.	I upgraded my own communication infrastructure, such as use stable telecommunication company service.	4.17	1.637
3.	I received instructional design and development support from my university.	4.09	1.293
4.	My university provides technical assistance in course development issues.	4.07	1.392
5.	My university's faculty technology professional development helps meets my technology needs.	4.02	1.338
6.	My university developed a cost-saving technologically-enhanced classroom that reduces the labour costs of instructors and the need for other technical staff.	3.47	1.535
7.	I made a report with the Internet Service Provider (ISP) company regarding the services provided.	3.23	1.607

Scale: 6 = Strongly agree, 5 = Agree, 4 = Slightly agree, 3 = Slightly disagree, 2 = Disagree, 1 = Strongly disagree

3.3 The development of Online Learning Quideline for Academics

Since the six-point Likert scale was used, appropriate interval need to be established to represent the agreement level. Thus, the interval for this study is calculated as follow: (5/5) = 1. Table 5 shows the mean intervals with the associated agreement levels.

Table 5
The interval for the agreement level

Mean Interval	Agreement Level
1.0 – 1.99	Very Low Agreement
2.0 – 2.99	Low Agreement
3.0 – 3.99	Medium Agreement
4.0 – 4.99	High Agreement
5.0 – 5.99	Very High Agreement

The mean scores calculated for each construct were then mapped to the scale in Table 5 to determine the agreement level. Table 6 shows the mean scores for the strategies to address the four-dimension challenges.

Table 6
The level of agreement for the strategies to address the four-dimension challenges

No	Strategies to address the challenges	Mean	Level
Dimension: Designing and developing course materials			

1.	I provide students with supplemental course information such as course outlines, course objectives, concepts, and ideas.	3.5	Medium Agreement
2.	I select the simplest technology tools during course materials development, such as YouTube videos, to meet the course goals.	4.1	High Agreement
3.	I plan and review learning outcomes regularly to ensure clarity, utility, and appropriateness of course materials.	3.5	Medium Agreement
4.	I consider the various learning styles of students during course materials development.	3.5	
5.	I made a lot of changes to my course materials to meet pedagogy and necessary curriculum reforms.	3.8	
6.	I attended workshops or trainings on how to develop course materials and teach online classes.	2.9	Low Agreement
7.	I refer to subject matter experts to evaluate my course materials.	3.4	Medium Agreement
Dimension: Lack of quality standards or management of online resources creation			
1.	I ask my students to use certain tools to provide feedback regarding the course.	3.5	Medium Agreement
2.	I have the opportunity to use technology more innovatively to enhance course quality and develop new ideas.	3.4	
3.	My university proposes an enhancement in existing guidelines regarding minimum standards for online course design, development, and delivery to ensure quality standards are met.	3.4	
4.	I review course materials periodically to ensure course standards were met.	3.3	
5.	I design courses with a consistent structure and easily discernible to students of varying learning styles.	3.5	
6.	I receive guideline to develop templates, processes and systems to enhance the quality.	3.5	
7.	I receive tools and strategies that meet the minimum quality standard in the training course.	3.6	
Dimension: Lack of ICT skills or digital illiteracy			
1.	I have personal motivation to use technology.	3.3	Medium Agreement
2.	I was exposed to a variety of possibilities for integrating ICT into online teaching during course development.	3.0	
3.	I attended workshops or trainings to develop effective technology skills.	2.6	Low Agreement
4.	The Teaching and Learning Centre (TLC) or related department helped colleagues when they encountered difficulties in ICT or technology issues.	3.6	Medium Agreement
5.	I allocated a specific time for online learning technology skills faculty training.	3.2	
6.	There are peer mentoring resources available to academics in online teaching.	3.4	
7.	I share my problems to a specific channel or website that acts as a place for sharing and consultation between the academics.	3.5	
Dimension: Digital and Internet accessibility and equality			
1.	I used multiple methods to have reliable access to the internet.	3.3	Medium Agreement
2.	I upgraded my own communication infrastructure, such as use stable telecommunication company service.	2.4	Low Agreement
3.	I received instructional design and development support from my university.	3.3	Medium Agreement

4.	My university provides technical assistance in course development issues.	2.6	Low Agreement
5.	My university's faculty technology professional development helps meets my technology needs.	3.1	Medium Agreement
6.	My university developed a cost-saving technologically-enhanced classroom that reduces the labour costs of instructors and the need for other technical staff.	3.0	
7.	I made a report with the Internet Service Provider (ISP) company regarding the services provided.	3.1	

The guidelines were formulated based on the TPACK model, aligning effectively with the strategies employed to address challenges across the four dimensions. Additionally, an extra component was incorporated into the proposed guidelines to address challenges related to the quality standards or management of online resource creation, an aspect not covered by the TPACK model. As outlined in Table 7, the developed guidelines comprise four components: 1) content knowledge, 2) material quality knowledge, 3) technological knowledge, and 4) technological accessibility and equality. The items for each component of the proposed guidelines were derived from Table 6, focusing on those that achieved a medium level of agreement.

Table 7
The components of online learning guideline for academics

Content knowledge	
1.	Provide students with supplemental course information such as course outlines, course objectives, concepts, and ideas.
2.	Select the simplest technology tools during course materials development, such as YouTube videos, to meet the course goals.
3.	Plan and review learning outcomes regularly to ensure clarity, utility, and appropriateness of course materials.
4.	Consider the various learning styles of students during course materials development.
5.	Make changes to course materials to meet pedagogy and necessary curriculum reforms.
6.	Refer to subject matter experts to evaluate course materials.
Material quality knowledge	
1.	Ask students to use certain tools to provide feedback regarding the course.
2.	Use technology more innovatively to enhance course quality and develop new ideas.
3.	Refer to existing guidelines of the university regarding minimum standards for online course design, development, and delivery.
4.	Review course materials periodically to ensure course standards were met.
5.	Design courses with a consistent structure and easily discernible to students of varying learning styles.
6.	Refer guidelines from the university to develop templates, processes and systems.
7.	Use tools and strategies provided by the university that meet the minimum quality standard.
Technological knowledge	
1.	Instil motivation to use technology.
2.	Refer to Teaching and Learning Centre (TLC) or related department when encountered difficulties in ICT or technology issues.
3.	Allocate a specific time for online learning technology skills faculty training.
4.	Utilize peer mentoring resources available to academics in online teaching.

5.	Share problems to a specific channel or website that acts as a place for sharing and consultation between the academics.
Technological accessibility and equality	
1.	Use multiple methods to have reliable access to the internet.
2.	Get instructional design and development support from the university.

4. Conclusion

This study successfully achieved two main objectives. Firstly, it aimed to identify the challenges faced by Malaysian academics in adapting to online learning during the pandemic in Malaysia. The questionnaire, designed and distributed based on challenges identified in the literature review—namely, designing and developing course materials, lack of quality standards or management of online resources creation, lack of ICT skills or digital illiteracy, and digital and internet accessibility and equality—revealed through statistical analysis that designing and developing course material, lack of ICT skills or digital illiteracy, and lack of quality standards or management of online resources creation received high mean scores as online learning challenges (with values exceeding 2.5). However, participants expressed that these identified challenges were not significant, as the mean score for each challenge was below 3.0. This may be attributed to the respondents' agreement towards suggested strategies, with mean scores exceeding 4.0, indicating their effective implementation of the suggested strategies to address the challenges.

Secondly, the study developed online learning adaptation guidelines for Malaysian academics, primarily based on the TPACK model, with additional components. The responses from the 28-item questionnaire, focusing on strategies to address the challenges across four dimensions, were analysed for their degree of agreement. Items classified as having a 'medium agreement' level were incorporated into the respective components. The result in Table 4 indicates that most proposed strategies to address online learning challenges are deemed important and significant. The guidelines, therefore, reference two TPACK components—designing and developing course materials (content knowledge) and lack of ICT and digital illiteracy (technological knowledge), along with addressing digital and internet accessibility and equality. An additional component was included to address challenges related to quality standards or management of online resource creation. In conclusion, the developed guidelines encompass four components: 1) content knowledge, 2) material quality knowledge, 3) technological knowledge, and 4) technological accessibility and equality.

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