Effects of COVID-19 Pandemic on Higher Education Teaching Practices in Malaysia

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Abstract: This paper presents an initial investigation into the transformations observed in the learning processes within Malaysian educational institutions following the onset of the COVID-19 pandemic. Like educational systems worldwide, Malaysia has undergone significant adjustments in response to the spread of the virus. The study specifically examines the characteristics and challenges faced by Malaysian universities as they transition to online and blended learning during this era of global isolation. Utilizing a set of questionnaires, the research explores the pandemic's impact on teaching practices in Malaysia across content, instructional delivery, and assessment. Findings suggested that the COVID-19 pandemic has posed significant challenges to the global education system, compelling institutions and educators to adapt quickly to online teaching. While adjustments were made in course content, the shift leaned towards more theoretical aspects, raising questions about the efficacy of this approach for student learning. Despite shortcomings, educators managed to achieve course learning outcomes. This study aims to provide insights into adaptive strategies for the new norms of teaching and learning, ensuring the continuity of education for all amid changing circumstances and crises.

Keywords: Adaptive mechanisms, Higher education, Online distance learning (ODL), Pandemic, Teaching practices, Covid-19

1. Introduction

The COVID-19 pandemic has affected the teaching and learning process of higher learning institutions around the world. Many institutions were forced to close to curb the spread of the virus. This crisis has caused higher learning institutions to switch to Online Distance Learning (ODL) and hybrid teaching and learning methods. Faculties were forced to adopt and adapt to these methods to allow teaching and learning to take place. Crash courses were given on how to best deliver online lessons, what platform to use and how to conduct classroom management online (Tew Abdullah, Roslim & Mohd Salleh (2022), Dubey & Pandey, 2020).

Malaysia is no exception to this. Faculties who were not used to online distance learning before were forced to learn new methods in teaching. Adaptations were made to courses taught to ensure teaching and learning can take place amidst online. The positive side was that many universities in

Malaysia were ready in terms of providing ODL having experienced providing blended learning that combines both face to face and online communication since before the pandemic (Abu Seman, Hashim, Mohd Roslin, Mohd Ishar, 2019). Universities such as Open University Malaysia (OUM) and Universiti Tun Abdul Razak (UNITAR) have already offered full time courses online. In most of the universities in Malaysia, some faculties were already trained, and the rest required some basic training before embarking on ODL throughout the Movement Control Order (MCO) in Malaysia. According to Allan et al. (2020) the most used online learning mechanisms in institutions throughout Malaysia are Google Classroom, Microsoft Teams, Google Meet, Webex, Zoom, Skype, Kahoot and Quizziz to list a few. To adapt to asynchronous teaching and learning many used platforms such as WhatsApp and Telegram. Apart from being apt in using the online T&L platforms, faculties must also adapt the courses they are teaching according to their students' wellbeing, internet connectivity and suitability of the courses to be taught entirely online. Thus, this paper aims to investigate the effect of pandemic in teaching practices in Malaysia in the context of content, instructional delivery, and assessment. Therefore there are three research questions guiding this study: (1): What were the adaptations done to the course content during COVID-19 pandemic online teaching?, (2) What were the adaptations done to instructional delivery during COVID-19 pandemic online teaching?, and (3) What were the adaptations done to assessment during COVID-19 pandemic online teaching?

2. Literature Review

The COVID-19 pandemic has indeed affected education practices worldwide. Due to the closures of educational institutions, online and distance learning (ODL) has become the only solution for education to continue despite the challenges faced by both educators and learners. Higher education institutions were also forced to embrace a fully ODL approach to ensure the teaching and learning process is not disrupted. Despite having distance learning programmes as part of university programmes, the shift to ODL from a conventional face-to-face classroom proves to be a challenge and this has caused educators to be 'self-conscious' (Azza Jauhar, Raihana, Yusnita, Wan Rauhan & Wan Mariam, 2020) as they were obliged to adopt a system they are not familiar with (Pokhrel & Chhetri, 2021) and implement a 'pedagogical shift', moving on to a more digitized virtual learning which that has proven to be challenging (Mishra, Gupta & Shree, 2020). Dubey and Pandey (2020) earlier mentioned some common problems related to ODL: learners' location which is mostly in rural areas, lack of sufficient infrastructure, access to technology and preparedness for delivery. Many studies in Malaysia reported that motivation to learn and internet coverage are among the challenges faced by university learners (Othman, Sulaiman, Najib & Ismail, 2022).

These constraints have not been left unresolved because educators worldwide have started embracing new strategies to continue with the teaching and learning activities. So far, a number of online platforms like Google Classroom, Microsoft Team, Canvas and Blackboard have been utilized (Petrie 2020 in Pokhrel & Chhetri, 2021). Nonetheless, Pokhrel & Chhetri (2021) asserted that the use of appropriate and workable instructional strategies in online learning may rely on the expertise and amount of exposure to information and communications technology (ICT) for both learners and educators. Thus, educators have been experimenting with readily available online learning platforms and resources by using synchronous and asynchronous learning tools. In their 2021 study, Jung and Lee aimed to explore modifications made by university faculty in response to the urgent shift to online teaching during the COVID-19 pandemic, specifically focusing on (1) technology utilization, (2) teaching approaches, and (3) attitudes towards online teaching. The researchers also investigated the factors at individual, course, and institutional levels influencing these adjustments. The study revealed that educators implemented the most substantial modifications in their teaching behaviors, with technology use following closely behind. Although the shift in beliefs about online teaching was relatively minor, it was deemed statistically significant. The unavoidable context of the COVID-19 pandemic has compelled educators to make a change in their teaching behavior without really making corresponding changes in their beliefs.

In Malaysia, educators are also compelled to embrace online teaching and they encounter similar challenges faced by other educators worldwide such as internet connectivity, lack of facilities and instructional delivery (Dubey & Pandey, 2020; Pokhrel & Chhetri, 2021). Azza Jauhar et al. (2020)

investigated lecturers' readiness and emotional presence to online teaching in a Malaysian university and they reported that lecturers were concerned with a number of pedagogical issues: a) preparedness in instructional delivery since 73.9% of the respondents stated that they do not have much experience in online teaching, b) content adjustment especially courses that require laboratory and practical work which 88.9% of the respondents strongly believe that it must be conducted in the conventional face-to-face approach, and c) adjustment to assessment especially in assessing psychomotor skills of the courses. In terms of emotional presence, most lecturers were worried about their students' ability to follow the lessons and their desires of having a better workplace environment. These are all validated concerns that many educators faced. Nonchalantly, they accepted the challenges and adjusted accordingly to meet the demands of online teaching and learning.

Therefore, given the unexpected challenges brought upon by COVID-19 toward the higher education landscape in Malaysia, this study sought to investigate how educators managed the sudden change to fully ODL teaching by identifying the kinds of adjustments they made to three aspects: their content, instructional delivery and assessment.

3. Methodology

3.1 Participants and Data Collection

A total of 138 university educators from higher education institutions in Malaysia participated in this study, which was conducted using an online survey distributed via email, social media, WhatsApp, and Telegram. The sample consisted of 70.37% (n = 98) women and 29.63% (n = 40) men. In terms of ethnicity, the majority of participants were Malay (89.6%, n = 124), followed by Chinese (3.7%, n = 5), Indian (1.5%, n = 2), Bumiputera Sabah (2.2%, n = 3), Bumiputera Sarawak (0.7%, n = 1), and other ethnicities (2.2%, n = 3). Teaching experience among participants was relatively evenly distributed: 11.8% (n = 16) had less than 5 years of experience, 16.3% (n = 22) had 6 to 10 years, 34.8% (n = 47) had 11 to 15 years, 18.5% (n = 25) had 16 to 20 years, and 19.3% (n = 26) had more than 20 years.

Participants' prior experience with online teaching varied: 17.8% (n = 24) reported having no experience before the pandemic, while 22.2% (n = 30) had less than 25% of their teaching experience online. Additionally, 8.4% (n = 11) had more than 25% experience, 13.3% (n = 18) had more than 50% experience, 18.5% (n = 25) had more than 75% experience, and lastly 20.7% (n = 28) had 100% of their teaching experience online. Regarding academic disciplines, 70.4% (n = 95) of participants taught courses in the arts, humanities, and social sciences, while 29.6% (n = 40) taught in engineering, sciences, and medical fields. The number of courses taught also varied: 14.9% (n = 20) taught one course, 36.3% (n = 49) taught two courses, 34.8% (n = 47) taught three courses, 8.9% (n = 12) taught four courses, 4.4% (n = 6) taught five courses, and 3.0% (n = 4) were not teaching any courses at the time of the survey. The preferred platforms for online teaching included Google Meet, Google Classroom, Zoom, Microsoft Teams, Telegram, Canva, Padlet, YouTube, UFuture, and MOOCs, in addition to various websites for online quizzes and tests.

Due to movement restrictions during the pandemic, data were collected via the WhatsApp application and analysed using descriptive statistics with SPSS software.

3.2 Research Instrument

A 21-item questionnaire was developed and validated through a pilot study (with .91 Cronbach's Alpha value) to answer the research questions of this study. The questionnaire consisted of four sections: (A) Demographic Data, (B) Adaptation to Course Content, (C) Adaptation to Instructional Delivery and (D) Adaptation to Assessment.

Section A: Demographic Data consisted of 11 questions to assist in understanding the respondents' background. Section B: Adaptation to Course Content consisted of three Multiple Choice Questions (MCQ) to seek answers on what are the adaptations made by educators to suit the content to online teaching and learning. Section C: Adaptation to Instructional Delivery consisted of three MCQ

questions to find out the adaptations to instructional delivery conducted and lastly Section D: Adaptation to Assessment consisted of four MCQ questions on what are the adaptations made by educators to suit online learning assessment.

4. Results and Discussion

The following are the results from the survey which are discussed in three sections.

4.1 Adaptation to Content

4.1.1 During the COVID-19 pandemic, how much adjustment was made to the contents of the course you were teaching to suit online distance learning?

As a result of ODL due to the pandemic, it was found that the majority of respondents (86.2%) made adjustments to their course content while 13.8% indicated that they made no adjustments. Out of the percentage of respondents who made adjustments, 23.2% made adjustments of 50% or more, 21.7% made at least 75% adjustments, 16,7% made adjustments of 25% or more, 14.5% made less than 25% adjustments and 10.1% adjusted their entire content.

4.1.2 How has the content in the course you are teaching changed due to the consequences of the COVID-19 pandemic?

In terms of how the course content had changed, the most frequently reported change was that the content had more theories rather than practical focus due to the constraints brought about by the pandemic (45.7%). Yet interestingly, many also reported that the content became more practical in the sense that they used case-studies (problem-based learning) to engage students, 31.2% made changes to their course learning outcomes (CLOs) and some respondents (7.2%) removed certain topics from their courses, deeming them unsuitable for online instruction, while 21.7% reported making no changes

Respondents further shared that some contents were modified to suit online platforms taking into consideration the available facilities, devices and other infrastructure issues. Amendments were made to assessments to better align with the CLOs and the teaching plans were adjusted to incorporate both synchronous and asynchronous lessons. One respondent explained that it was difficult to conduct listening and speaking activities during their phonetics and phonology course. Therefore, the lecturer had to share the voice recordings for students to listen to on their own. Courses requiring face-to-face lab sessions were also significantly impacted. Adaptations included converting live labs into do-it-yourself (DIY) experiments, utilizing virtual labs, and preparing video demonstrations, followed by students answering questions based on the video content.

Other practical courses (performance-based) also required changes due to ODL. Respondents reported that the practical element of their course was carried out in minimal condition according to what students had around them. Students also recorded videos that showed them demonstrating a particular skill (such as bed-making) while some reported that they could not perform some hands-on activities at all including clinical practice. One respondent shared that they replaced the practical part of their course with presentations where students tended to be scripted and dull. As for projects, respondents reported that the size of the project had to be scaled down and as materials and equipment were limited, students had to be creative. Community projects also had to be carried out online.

However, some respondents felt that they could still teach without changing their content by making use of ODL tools. One respondent noted that whether to change content would depend on the type of subject being taught whereas another respondent explained that it depends on the lecturer's creativity to adapt and innovate as fundamentally, their CLOs had not really changed although the mode of teaching had. Many also mentioned that while they had not made changes to their content, they had nonetheless made adjustments in other aspects of the course such as changing assessment type (e.g. final exam converted to final project, increasing group or pair work, using case studies), adjusting the weightage of assessments and reducing the total number of assessments.

Several respondents also highlighted that ODL in general affected student engagement. One respondent wrote at length about their frustration at not being able to engage with students more and that they felt as if they were talking alone with hardly any interaction from students which made the class boring and affected their enthusiasm to teach. Conversely, another respondent noted that online and distance learning (ODL) offered certain advantages, as it encouraged students to explore topics more independently, which indirectly enhanced content delivery and deepened their understanding.

4.1.3 Do you think your course learning outcomes (CLO) could still be achieved when teaching during the COVID-19 pandemic?

Most respondents (85.5%) believed that the course learning outcomes (CLOs) could be achieved, while only 14.5% expressed doubts about their attainability. Respondents shared that there should be flexibility and that lecturers could choose methods and materials that were most suited to achieve the CLOs. However, some respondents noted that realistically, not all CLOs could be achieved well, particularly those that involved practical skills (psychomotor domain). Respondents felt that for such courses, students missed out on the authentic practical experience. One respondent (n=1) stated that for dentistry, contact with real patients was necessary. Other grouses shared by respondents included that students need to learn how to use the lab apparatus for science subjects and that students were not learning how to handle lab work due to ODL.

Another respondent explained that they had to do double work as practical sessions via ODL were conducted in small groups with multiple sessions and noted that students were less confident besides there also being a higher failure rate for the course compared to before the pandemic. Some even opined that CLOs could be achieved well only for theory-based subjects. Others highlighted that they could only ensure they were doing their best to teach well during ODL but that students also needed to have their own effort in learning and that lecturers do not know what is going on beyond the computer screen. Thus, some respondents noted the importance of having two-way communication and reviewing student feedback regularly.

4.2 Adaptation to Instructional Delivery

4.2.1 What was your preferred instructional delivery method during the COVID-19 pandemic?

The survey found that the most preferred method of instructional delivery was online lecture (89.1%). The next most preferred was online discussion (67.4%), followed by recording the lecture (59.4%), using Google Classroom (59.4%), getting students to pre-record their presentations (32.1%) and using voice messages (18.1%). Some (21%) respondents noted that online lectures and discussions encouraged student engagement as it calls for two-way communication and enables lecturers to give direct feedback to students. Additionally, it also enables lecturers to show live demonstrations. Yet on the contrary, one respondent felt that students tended to be quiet and detached during online lectures and therefore preferred asynchronous lessons instead, meeting students online only when there is a need to address students' understanding on a topic. In fact, many respondents (81%), highlighted the need to record their lectures due to technological limitations of ODL such as poor internet connection, particularly in rural areas of Sabah and Sarawak. This would enable students to access the lectures at their convenience and not be left behind in their lessons. Recorded lectures were also used for asynchronous classes and helped to ensure classes followed the scheduled scheme of work when it was not possible to hold synchronous classes due to reasons such as public holidays.

91% of respondents also shared that text messages are a fast way of communicating and obtaining information between student and lecturer, which could be done, for example, through the chat box feature (in online lectures), WhatsApp or Telegram. One respondent mentioned using the learning management system (LMS) of the university whereas several others stated that a combination of different delivery methods could actually be more interesting and effective in achieving the desired learning objectives. Utilizing a variety of delivery methods also offered more flexibility to suit students' particular needs or situation. And interestingly, as one respondent pointed out, ensuring success in ODL may require lecturers to use methods that students preferred instead of what lecturers may prefer.

4.2.2 Did you adjust (reduce) the hours of instructional delivery to suit online distance learning?

A total of 87% of respondents reported reducing the number of teaching hours but 13% of respondents did not make any changes at all. Of those who made changes, 29% reported reducing the number of teaching hours by 50% or more, 27.5% made at least 25% changes, 9.4% made changes of 75% or more while 21% made less than 25% changes. Those who made changes by reducing ODL teaching hours offered various justifications. The reasons included that some students faced problems with internet connectivity, thus lectures needed to be brief. Others noted that sitting for prolonged periods of time was not effective. Reducing the number of hours would also depend on topics being discussed. Shorter online meetings (ranging from 1 to 1.5 hours) may include additional tasks for students to complete asynchronously such as answering questions or discussions in WhatsApp or Telegram. Conversely, more complex topics required longer online meetings. One respondent related that there is a lot to cover in the Association of Chartered Certified Accountants (ACCA) syllabus thus requiring more online time.

The respondents who reported not making any changes stated several reasons for maintaining the existing teaching hours. Some of them wanted to maintain the same contact hours with students and follow the timetable. Others required the full teaching hours to explain basic concepts and cover the course content. For example, one respondent noted that longer hours were needed to explain the basics of law and to invoke interest in students who entered the course without prior knowledge on law (Sijil Pelajaran Malaysia (SPM) leavers).

6.2.3 In delivering your online teaching, what were some of the pedagogical approaches / strategies that you preferred (applied)? (Please select all that apply)

The most preferred pedagogical approach among respondents was collaborative learning (63.8%) followed by creative pedagogical approaches (55.1%) which included quizzes and Kahoot among others, care pedagogy (emotional chat, emotional checking and so on) with 42.8%, dialogic and debates (29%) and others (5.1%). According to some respondents, using such pedagogical approaches would make learning more interesting and less stressful for students. One respondent noted that different approaches will produce different feedback from students. Respondents also shared other pedagogical approaches that they preferred such as Socratic method, task-based self-access learning, demonstrations, using gamification elements available online and having regular chats with students to help lessen any mental or emotional stress they faced.

4.3 Adaptation to Assessment

4.3.1 During the COVID-19 pandemic, did you adjust the assessment of the course you are teaching to suit online distance learning?

As expected, online and distance learning (ODL) impacted the assessments conducted by most respondents. A majority (93.5%) reported adjusting their assessments, with approximately 55.1% indicating that they had modified at least 50% or more of their assessment practices.

4.3.2 How were the assessments adjusted to suit online learning?

Respondents adjusted their assessments to suit ODL in various ways. The most frequent type of adjustment made was changing existing assessments to other methods that were more suited and practical for online learning (65.9%). For example, instead of doing live presentations and speech, several respondents required students to submit them in recorded format. Whereas some opted for an entirely different assessment. For example, one respondent reported changing their final exam into a final project while another respondent opted to administer short answer questions in place of clinical assessment. An equal number of respondents also reported they reduced the number of assignments (41.3%) and simplified existing assessments (41.3%). This includes reducing the total number of

assessments (one respondent reduced 8 assessments to just 4 in total), reducing the scale or size of projects and encouraging the use of alternative materials for those projects, reducing the number of tests, doing away with quizzes and final exams, promoting pair and group work in order to lessen students' workload and increasing coursework. About twenty three percent of respondents maintained the existing assessment types but changed the weightage of those assessments while 17.4% gave more individual assessments.

However, there were a number who did not make any changes to their assessments at all, stating reasons such as a particular exam (Association of Chartered Certified Accountants or ACCA exam) was already computer-based while others stated that they needed to strictly follow the set course assessment plan. Interestingly, a number of respondents shared that due to the nature of ODL it was difficult to monitor students' assessments, that they were aware there was a risk of plagiarism and even "assignment helper services". This led them to construct questions or tasks that were more critical and specific to their classes. For example, one respondent administered open-book tests with questions focusing on Higher Order Thinking Skills (HOTS) while others required students to give responses that were either reflective, application-based or specific to the particular topics or issues discussed in class. One respondent explained that the quality of assignments mattered more than quantity, and this meant students seeking consultation and guidance from their lecturer on their drafts and correcting mistakes along the way.

4.3.3 What form of preferred assessment was employed?

As for their preferred form of assessment, online tests garnered the most votes (82.6%), followed by group assignments (70.3%), recorded presentations (60.1%) and online quizzes (54.3%). Respondents also mentioned a variety of other types of assessments they preferred including case studies, online exams, online presentations, discussions, question-and-answer sessions (Q&A), project-based learning (PBL), online poster presentation, video assignments, portfolios and even getting students to publish their work on social media. Some respondents shared similar views in that they regarded all assessment types as relevant and served specific purposes. For example, group work promoted communication skills and teamwork whereas individual assignments helped to assess students' mastery of the subject. Therefore, they saw it necessary to have a mix of methods to ensure a balanced (holistic) assessment of students.

4.3.4 What mechanism did you use to observe integrity issues for online assessment?

In their effort to ensure integrity, most lecturers required students to run their work through plagiarism software before submission (59.4%) while 42.8% of lecturers ran the software themselves. A number reported administering open-book or take-home exams where the questions were application-based, open-ended or of higher difficulty. Some respondents reported they would cut and paste students' answers on Google to see what came up. Others required students to show evidence (video recording) of the processes they undertook in completing the assignment. Some respondents shared they asked students to open their cameras during exams. Other responses included requiring students to submit handwritten work, checking up on students' progress and preparing multiple sets of questions for tests. However, it may be difficult to ensure integrity in certain cases such as in the case of questions requiring step-by-step calculations or in small group assignments. In fact, quite a number of respondents believed in making students more aware and accountable for their actions by getting them to sign declaration forms or integrity pledges.

On the other hand, some others believed there was a need to show more trust in students as well as be more flexible and accommodating considering the pandemic. As such, students were assessed based on the work they turned in - looking at things like originality of ideas and creativity. One respondent noted that health was more important during this time and learning should be a meaningful and enjoyable endeavor.

5. Conclusion

The COVID-19 pandemic has posed significant challenges to the global education system, compelling educators to transition to online teaching and adapt their courses for virtual delivery. While many institutions have successfully implemented these changes, the shift towards more theoretical content, due to constraints on practical, hands-on activities, raises important questions about the efficacy of this approach. Although course learning outcomes have generally been met, the predominance of theoretical content over practical experience may not fully address the educational needs of all students. During the pandemic, educators preferred online lectures and reduced teaching hours to alleviate student stress. However, this adjustment may not be equitable for all learners. As highlighted by Bajaba, Mandurah, and Yamin (2021), disparities in internet access, electricity, and technology among students from lower socioeconomic backgrounds have exacerbated educational inequities, potentially marginalizing those unable to participate fully in online learning.

To address these challenges, educators have adapted assessment methods to better suit online formats and have employed plagiarism detection tools such as Ouriginal and Turnitin. Nevertheless, concerns about academic integrity persist, necessitating ongoing scrutiny and refinement of assessment practices to ensure fairness and uphold educational standards.

The transition to online education during the COVID-19 pandemic has necessitated a shift towards more theoretical content within science courses. This adaptation has enabled continuity in learning outcomes despite the limitations on practical, hands-on experiences. While this approach has been largely effective in meeting course objectives, the lack of practical activities may undermine the development of essential scientific skills. Moreover, the reduction in teaching hours, while intended to alleviate student burden, may disproportionately affect those with limited access to technology, highlighting the need for equitable solutions to ensure all students can fully engage in science education. In the social sciences and humanities courses, the pivot to online instruction during the pandemic has resulted in a greater emphasis on theoretical content, with less focus on interactive and experiential learning. This shift has generally supported the achievement of learning outcomes, though it raises concerns about the depth of engagement with practical and contextual aspects of the subject matter. The reduction in teaching hours has been a practical measure to ease student workloads, yet it may not address the inequities faced by students lacking access to necessary technological resources. Ensuring equitable access and maintaining academic integrity in assessments remain crucial issues that require continued attention.

6. Future Research Suggestions and Implications

In future studies examining the impact of global crises on education, a comprehensive approach is essential to address the critical factors illuminated by current research. The focus should not only be on overcoming the immediate challenges of transitioning to online instruction but also on evaluating the effectiveness of increased theoretical content in virtual learning environments. Researchers should investigate the optimal balance between theoretical and practical elements to enhance student learning outcomes.

Equity and inclusivity in online education should be a central theme, with a particular emphasis on bridging the digital divide and ensuring access for students from lower socioeconomic backgrounds. Future studies should also explore the effects of reduced teaching hours on student learning and investigate alternative instructional strategies that can be both effective and equitable.

Additionally, examining evolving assessment methodologies in online education is crucial, particularly regarding maintaining academic integrity while addressing plagiarism concerns. Researchers should also consider the mental health implications of prolonged online learning, highlighting the need for robust counseling services and government interventions to support students during periods of isolation and uncertainty.

As we move beyond the immediate impacts of the COVID-19 pandemic, it is vital to reflect on the lessons learned to guide future educational practices. The shift to online learning has revealed both opportunities and challenges, underscoring the importance of adaptability and resilience in education.

The increased theoretical focus during the pandemic has provided valuable insights into how online education can be structured, but it also highlights the need for a balanced approach that incorporates practical experiences. Moving forward, educational institutions should strive to integrate practical components into online curricula to ensure a well-rounded learning experience.

Addressing the digital divide remains a significant challenge. Ensuring equitable access to technology and resources is crucial for creating an inclusive educational environment. Future policies should focus on bridging this gap to provide all students with equal opportunities for learning. The impact of reduced teaching hours on learning outcomes should also be carefully considered. Future research should explore how instructional time can be optimized without compromising educational quality.

Moreover, maintaining academic integrity in online assessments remains a key concern. Developing robust and fair assessment methods will be crucial in upholding educational standards while mitigating plagiarism.Lastly, the mental health implications of extended online learning must be addressed. Strengthening support systems and providing adequate counseling resources will be essential in helping students navigate periods of isolation and uncertainty. By incorporating these insights, policymakers, educators, and institutions can better navigate future disruptions and work towards a more resilient, equitable, and effective education system.

7. Co-Author Contribution

The authors affirmed that there is no conflict of interest in this article. Fatin Aliana Mohd Radzi carried out the field work and overlooked the writeup of the whole article. Nadia Ainuddin Dahlan prepared the literature review. Melissa Malik wrote the research methodology and did the data entry. Farhana Wan Yunus carried out the statistical analysis and interpretation of the results. Khadijah Said Hashim wrote the discussion, conclusion and suggestion sections.

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