



MINISTRY OF HIGHER EDUCATION

JPT | DEPARTMENT
OF HIGHER
EDUCATION



A REPORT ON DIGITALIZATION OF TEACHING AND LEARNING IN HIGHER EDUCATION:

A Reality Check

The 2021 Report on Digitalization of Teaching and Learning in Higher Education: A Reality Check is a collaboration between the Ministry of Higher Education, Malaysia and Malaysia Qualifications Agency to drive digital learning in Malaysia.

© Ministry of Higher Education

All rights reserved.

No part of this publication may be reproduced, distributed, or transmitted in any form or any means, including photocopying, recording, or other electronic or mechanical methods, without prior written permission from Ministry of Higher Education Malaysia.

ISBN 978-967-19706-1-4

Perpustakaan Negara Malaysia Cataloguing-in-Publication Data

Citation:

MoHE (2021). Report on Digitalization of Teaching and Learning in Higher Education: A Reality Check. Putrajaya: Ministry of Higher Education Malaysia.

Published by:

Department of Higher Education
Ministry of Higher Education
No. 2, Tower 2,
Jalan P5/6, Precinct 5,
62200 Putrajaya, Malaysia
First Printing, 2021



MINISTRY OF HIGHER EDUCATION

Table of Contents

FOREWARD

01	INTRODUCTION	01
02	HOW HIGHER EDUCATION INSTITUTIONS HAVE EMBRACED DIGITALIZATION OF TEACHING AND LEARNING IN MALAYSIA?	02
03	WHAT HAVE WE LEARNED FROM ONLINE LEARNING DURING COVID-19 PANDEMIC?	05
04	WHERE DO WE GO FROM HERE?	11
05	CONCLUSION	20

Introduction

Malaysia established Dasar ePembelajaran Negara (DePaN) in 2011 as the first step to transform Higher Education Institutions (HEIs) to be globally competitive through e-learning. It detailed out the pillars that HEIs should focus on in moving forward for digitalization in teaching and learning (T&L): infrastructure, organizational structure, professional development, curriculum and e-content, and enculturation (MoHE, 2011). These pillars later support many other Malaysia Ministry of Higher Education initiatives where it serves as part of the foundation for Malaysia Education Blueprint (Higher Education) 2015-2025 in Shift 3 Lifelong Learning and Shift 9 Globalized Online Learning (MoE, 2015).

Under Malaysia Education Blueprint (Higher Education) 2015-2025, Digital Transformation of Higher Education Strategic Plan (2021) is formulated to further drive Shifts 3 and 9. Along the way, Malaysia Digital Economy Blueprint called MyDigital (2021) is also introduced to transform Malaysia into a digitally-driven high income nation and this empowers digitalization of teaching and learning because Malaysia aims to have an open access knowledge bank to house teaching materials for educators. This means that all educators can learn from each other using the knowledge bank.

Due to an unprecedented event in 2020, higher education institutions nationwide have to transition rapidly to emergency remote learning. Given the previous extensive initiatives on online learning based on DePAN since 2011, which outlined all required instruments for successful teaching and learning activities as well as timeline for all HEIs to adhere to, it is expected that all HEIs can transition smoothly to online learning during the pandemic.

Ten years have passed and where are we in the year 2021?

How Higher Education Institutions (HEIs) have Embraced Digitalization of T&L in Malaysia?

Malaysia is very aggressive to break down the barriers to digitalization which has driven changes of governance at many Higher Education institutions (HEIs).

Over the past 10 years, public universities had established a dedicated unit to focus on digital teaching and learning which means there are specific staff being assigned to oversee the infrastructure, info structure and the overall process of teaching and learning that includes digital teaching and learning.

By 2021, all Malaysia public universities already have their own center for teaching and learning with a specific unit to look into digital T&L. Along with the establishment of this center, they formulated policies and guidelines on e-learning at institutional level.

BY 2021, ALL MALAYSIA PUBLIC UNIVERSITIES ALREADY HAVE THEIR OWN CENTER FOR TEACHING AND LEARNING



Digitalization of T&L at HEIs

HEIs have been very active in changing the way they deliver teaching and learning digitally. Many HEIs are guided by policy on online learning, have dedicated budget for digitalization of T&L, set up their own Learning Management System, and some even established digital content development studio.



01. POLICY AND GUIDELINES

Among the HEIs that established their own policy and guidelines related to online learning, public universities were found to be the majority of the HEIs who has policies already in place (26.3%). Followed by private college (24.5%), polytechnic (20.6%), community college (14.3%) and institution from other ministries (16.7%) such as vocational colleges.



02. BUDGET ALLOCATION

24.3% HEIs already allocated budget for online learning development and implementation. Within this percentage, majority of public universities are found to be more ready (40%) compared to private university (27.35), polytechnic (17.7%), private college (16.9%), community college (14.3%) and institution from other ministries(11.1%)



03. DEDICATED CENTRALIZED UNIT & AVAILABILITY OF LEARNING MANAGEMENT SYSTEM

75.7% HEIs have their own centralize unit to coordinate digital learning where all 20 public universities in Malaysia have their own center for coordination. Meanwhile 62.2% HEIs have own self-developed learning management system to support online learning where it is also found that all 20 public universities have their own learning management system.

Based on the phases of implementation in DePAN (2011), majority public universities are by now familiar with blended learning and have achieved at least 30% of the courses delivered in blended learning mode. In fact, they have also moved past that with the introduction of Blended Learning Substitution Guidelines (2019) which focuses on the quality of blended learning delivery as shown in Figure 2.

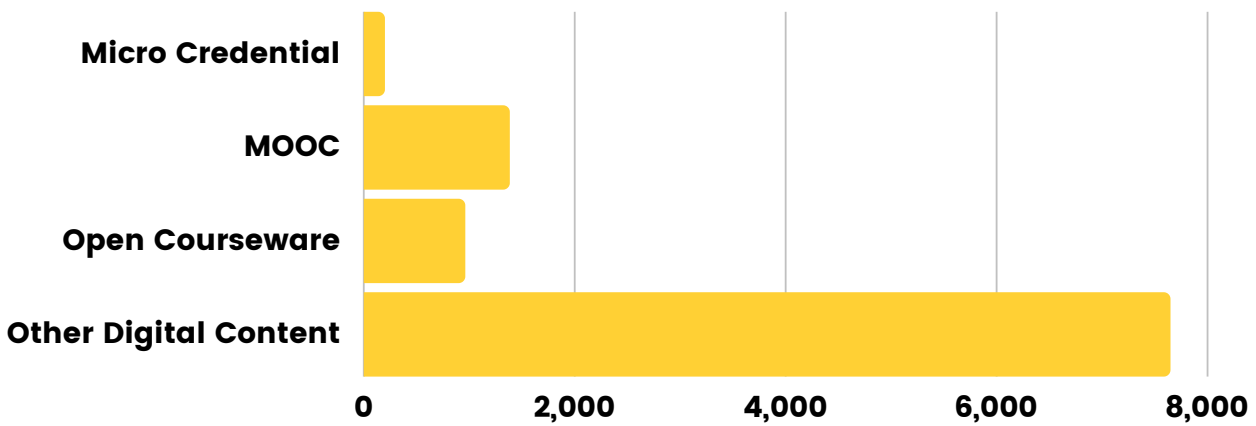


Fig 1: Digital Content Development by Malaysia Public Universities (Source: MoHE, 2020)

HEIs also produced digital contents in the form of Massive Open Online Courses (MOOC), Open Courseware, Micro Credentials and other types of digital content which are rapidly developed within 10 years (see Figure 1). HEIs also developed fully online academic programs through Open and Distance Learning (ODL) to allow more flexibility for learning.

Despite these early preparations, there is a need to further unpack HEIs' readiness since coping with the sudden impact of educational shifts during the COVID-19 pandemic.

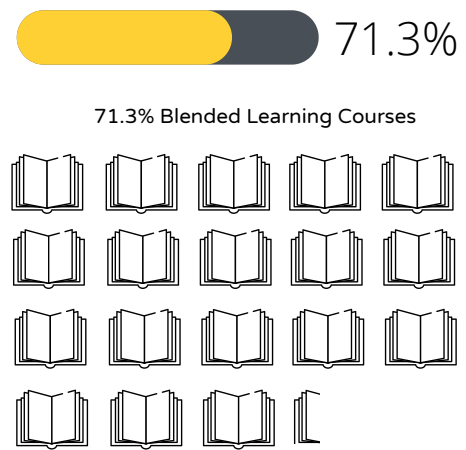


Fig 2: Blended Learning Implementation at Public Universities in Malaysia (Source: MoHE, 2020)

What Have We Learned from Online Learning during COVID-19 Pandemic?

Upon shutting down all economic activities including education sector, Malaysia HEIs came to realize the importance of digitalization of T&L through online. Thus, a study was carried out to investigate HEIs, lecturers, and students' readiness for online learning and factors that contribute to satisfaction during COVID-19 outbreak. Questionnaires were distributed via online platform from 15 March 2021 until 30th April 2021. It gained responses from 250 HEIs, 5579 lecturers, 24,562 students, and 1220 support staff.

There are four (4) sets of surveys distributed to the respective target groups, validated by 5 content experts and found to be reliable based on item reliability check based on alpha Cronbach > 0.70. Data were analyzed descriptively and partial least squares structural equation modelling path analysis was also conducted. Presentation of findings were made to authorities at Kementerian Pengajian Tinggi in several series of presentation. The findings shed more light on how digitalization of T&L shaped online learning experience during the pandemic in Malaysia.



01. THE IMPORTANCE OF STRATEGIC DIRECTIONS AT INSTITUTIONAL LEVEL

Malaysia public HEIs are bodies governed by the Government but can be independent in making decisions for direction of their teaching and learning while private HEIs are bodies that are only subjected to the Government based on Universities and Universities College Act 1971.

Hence, any decision such as implementing or empowering digitalization of T&L at institutional level relies very much on the direction of the management because an institution driven by innovative management has better appreciation for creativity and new ideas in teaching and learning.

Through proper change management design, it was found that resistance to change in higher education can be reduced provided that clear targets are set, and support is given (Alhogail & Mirza, 2011). Figure 3 shows 64.5% of HEIs reacted to online learning by formulating policy or guidelines related to online learning during COVID-19 pandemic.

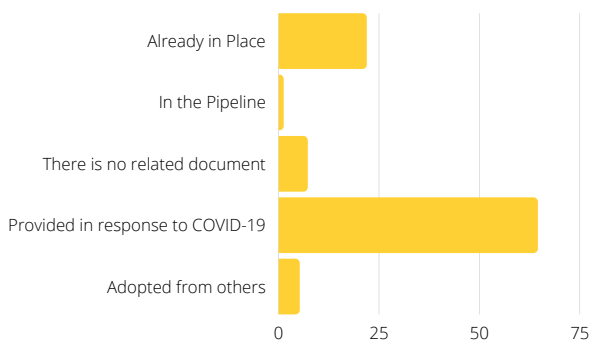


Fig. 3a: Policy on Online Learning at HEIs

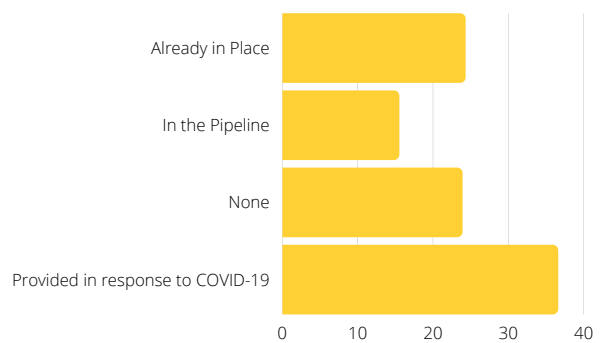


Fig. 3b: Budget Allocation for Online Learning at HEIs

Fig 3: Policy and Budget Allocation for Online Learning
(Source: Research on Quality of Online Learning during COVID-19, MoHE 2021)

Although there are only 24.3% HEIs that already have budget allocation in place, it is comforting to observe more HEIs provided budget for online learning in response to COVID-19 (36.6%) as shown in Figure 3. Elshami et al., (2021) indicated that lecturers expected institutional support in the form of training and organizational policy such as guidelines or manuals to assist them in conducting online learning.

At institutional level, online learning should be explicitly incorporated within the broader instructional strategic plan in line with the educational goals of higher education institutions. This would allow stakeholders (especially academics and support staff) to feel they are contributing to a greater context, not merely as a personal pursuit (William & Pennington, 2009).

What Have We Learned from Online Learning during COVID-19 Pandemic?



02. INSTITUTIONAL COMMITMENT IN SUPPORTING ACADEMIC STAFF

Lecturers come from different backgrounds, experiences and mindsets on how teaching and learning should be implemented. Addressing such diversity among the academics is important.

Lecturers with more than one year of online teaching experience are found to be more likely to be comfortable with online learning than those with less than one year of experience. It is also found that HEIs have experienced academic staff but very few are experienced in teaching online (see Figure 4).

		Years of Online Teaching Experience				
		< 1 Year	1-2 Years	3-5 Years	> 5 Years	None
Years of Teaching Experience	< 1 Year	198	3	0	2	8
	1-2 Years	178	106	1	1	4
	3-5 Years	281	284	29	2	4
	> 5 Years	1657	2101	279	301	103
	None	5	4	1	0	27

Fig 4: Years of teaching experience among academic staff at HEIs
 (Source: Research on Quality of Online Learning during COVID-19, MoHE 2021)

There are a lot of concerns about implementing online learning by academic staff such as concern for individual support and incentives. Institutions are encouraged to communicate with instructors to determine what incentives to offer as monetary incentives are not necessarily the incentives needed by lecturers (Mansureh, Angie and Santigue, 2017). Based on Figure 5, majority of HEIs provided some form of incentives for academic staff. Among these HEIs, 31.5% of them implemented prior to the pandemic while 19.3% implemented as a response to COVID-19.

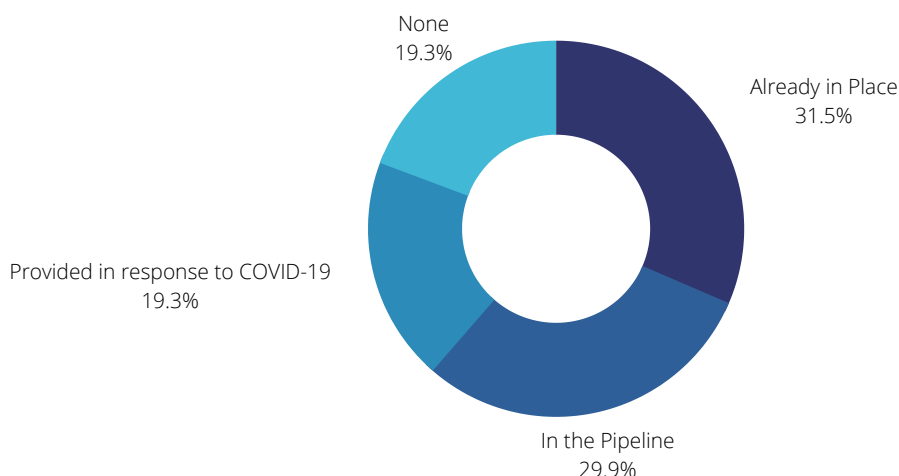


Fig 5: Percentage of HEIs providing incentives/rewards to academic staff for online learning (Source: Research on Quality of Online Learning during COVID-19, MoHE 2021)

Mansureh, Angie and Santigue (2017) suggested that the variation in roles in online learning is made more challenging when the instructor is a novice teacher in the online settings. It was found that lack of incentives discourage lecturers to design and deliver online courses.

External support, such as instructional design aid, opportunities to consult others, or a helpdesk, are examples of other supports that institutions can also provide (McGee, Windes & Torres, 2017). Malaysia HEIs commonly have four main job roles that the support staff play to support online learning during COVID-19 pandemic as shown in Figure 6.

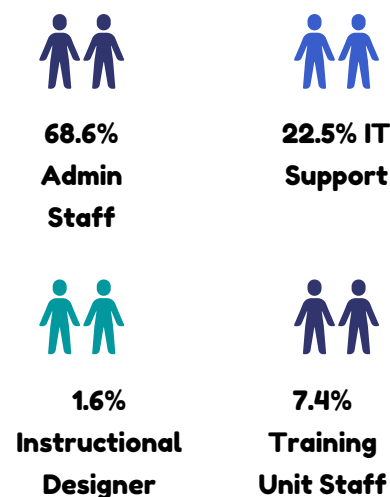


Fig 6: Job roles of Support Staff supporting Online Learning (Source: Research on Quality of Online Learning during COVID-19, MoHE 2021)

The presence of support professionals aided in reducing students' anxiety (Nuere & de Miguel, 2020). HEIs that provide a conducive ecosystem help to boost motivation among both academic staff and students for learning online (Castro & Tumibay, 2021).

What Have We Learned from Online Learning during COVID-19 Pandemic?



03. LECTURERS' COMPETENCY FOR CONDUCTING ONLINE LEARNING

Replicating online learning almost exactly what has been delivered face-to-face before COVID-19 such as through broadcasting pre-recorded lectures is no longer an option because the technology in education is now widely available and rapidly growing. In other words, standing before a camera and broadcasting is not the main idea of online teaching (Doughty, 2021).

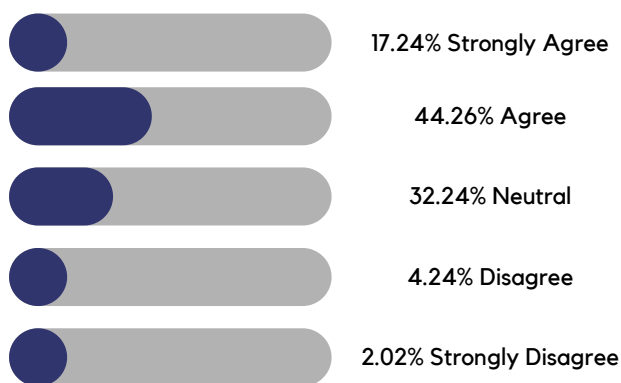


Fig. 7a: Students' Perception about Academic Staff Skills to Conduct Online Learning

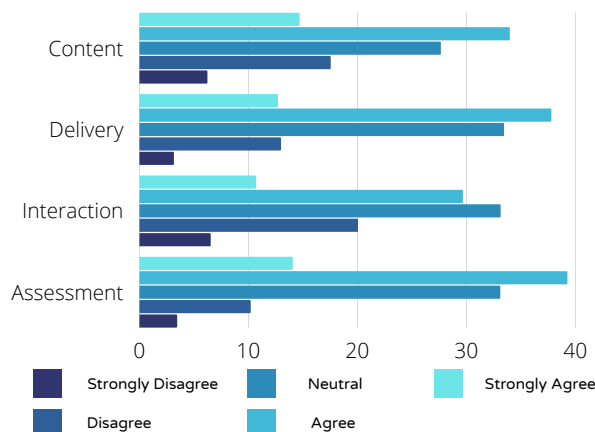


Fig. 7b: Students' Perception about Quality of Online Learning during COVID-19

Fig 7: Students' Perception on Quality of Online Learning during COVID-19 compared to Traditional Learning (Source: Research on Quality of Online Learning during COVID-19, MoHE 2021)

Students raised the importance of lecturers' competency as the determining factor for their online learning satisfaction particularly in engaging students. Figure 7a shows that majority of students perceived that their lecturers have skills to conduct online learning. The percentage is particularly higher in terms of content, delivery and assessment where they agree that the quality is similar prior to COVID-19 pandemic (see Fig. 7b).

Additionally, majority of them (79.97%) indicated that the quality of online interaction is the same as traditional learning. During COVID-19 pandemic, students seek for support to create a sense of belonging to the institution and interaction with their lecturers were found to be very crucial (Lengetti et al., 2021).

It contributes to their overall satisfaction with online learning during pandemic (Lengetti et al., 2021) and this is in line with the fact that learning engagement was found to have a direct relation with students' satisfaction in many studies (Bradford & Wyatt, 2010). Learning engagement in the form of giving prompt feedback will promote deep learning (Filius et al., 2019), assist efficient learning (Corbett & Anderson, 2001) and motivate students to learn online.



04. THE NEED FOR CONDUCIVE ONLINE LEARNING ENVIRONMENT

Lack of resources to connect to the internet, learning management systems and low-tech software are still an issue in many countries (Maqableh & Alia, 2021). In Malaysia, students are found to share devices, buy supporting hardware for online courses and deal with mental and health issues such as feeling stress with the abrupt learning environment transformation (Kumaim et al., 2021). This study found that 85.59% of students did not share devices but they made full use of mobile phone data for online learning during the COVID-19 pandemic (see Table 1).

Table 1: Students' Sharing Devices Status during COVID-19
(Source: Research on Quality of Online Learning during COVID-19, MoHE 2021)

SHARING DEVICES	HOME INTERNET SERVICE	MOBILE PHONE DATA	HOME INTERNET SERVICE & MOBILE DATA
Yes	13.82%	74.94%	11.24%
No	7.21%	85.59%	7.21%

These demonstrate students' level of readiness for online learning and will have effects on online learning perception and course satisfaction (Wei & Chou, 2020). But, because almost 30% of the students were found to have experience in online learning, efforts should be done to improve access to online learning.

WHERE DO WE GO FROM HERE?

The recent development has intensified the inevitable shift to embrace the digitalization of education and such a shift can only be successful if all parties involved play their respective roles. The following recommendations can be taken up as both high- and low-priority initiatives as well as from the perspective of long- and short-term measures. These recommendations are categorised according to the relevant authorities or implementers as summarized in Fig.8.



Fig 8: Summary of Where Do We Go From Here?

WHERE DO WE GO FROM HERE?



FOR HIGHER EDUCATION INSTITUTION: ASSURING ONLINE LEARNING IS AS IMPORTANT AS FACE-TO-FACE LEARNING

The COVID-19 pandemic has taught us valuable lessons about teaching and learning especially in mitigating the impacts of any crisis that would lead to prolonged closures of learning institutions. All experiences gained during this trying time will lead us to develop and improve digital education in normal times. To achieve this, we need to take an overarching perspective on online teaching and learning in higher education (Hofer et al., 2021) and not mainly focusing on quick-fix actions taken at the micro-level.

In terms of governance, some HEIs had formal policies in place for online learning deployment prior to the COVID-19 pandemic but many were caught off-guard without being guided by institutional policy. There is an apparent need to re-examine the governing policies concerning online teaching and learning with a clear description of procedures to be taken and goals to be achieved.

HEIs should now realise the fact that online learning is no longer a temporary measure to support face-to-face learning. It has its merits to be part and parcel of higher education and the quality of both modes should not be compromised. At any point of time when face-to-face learning is not feasible, online learning can take centre stage without disrupting students' learning experience. The transition should be seamless and HEIs must take necessary measures to assure academics, students, and support staff are ready to do so. Thus, HEIs should clearly outline these measures in their policies.

WHERE DO WE GO FROM HERE?



FOR HIGHER EDUCATION INSTITUTION: DIGITAL TRANSFORMATION TO SUPPORT DIGITALIZATION OF TEACHING AND LEARNING FOR BOTH ON-CAMPUS & OFF-CAMPUS STUDENTS USING HYBRID LEARNING

While ensuring the governance is in place, HEIs should take bold steps in leveraging technology for digital transformation beyond acquiring hardwares or devices. HEIs should in fact digitally transform the core operations of higher education from registration until graduation by establishing the much-needed ecosystem to support online learning for on-campus and off-campus students.

Infrastructure, infostructure, content production, training, incentives, and other elements deemed necessary for a conducive online learning environment must all be included in the ecosystem that is shaped by the benefits of hybrid learning. HEIs should be aware that hybrid learning is more than just converting parts of a programme syllabus into a virtual classroom. It is in fact a comprehensive approach to combine the best of both in-person and online learning in order to create a meaningful and impactful learning experience. The virtual components of a hybrid learning model should complement the in-person ones, not merely replacing the content. It is imperative to equip all stakeholders in the ecosystem with adequate digital literacy and competencies.

In creating the ecosystem, national publications such as DePAN (2011), Guidelines for e-Learning Implementation in Higher Education Institutions (2014), and other related documents can be consulted to ensure alignment with Government aspirations. Teaching strategies and modes that support hybrid learning such as flipped classrooms or even MOOCs should be given equal weight as in-person teaching.

WHERE DO WE GO FROM HERE?



FOR HIGHER EDUCATION INSTITUTION: SELF-MONITORING THE STATE OF DIGITALIZATION OF TEACHING AND LEARNING IMPLEMENTATION

Apart from embracing the digital transformation of teaching and learning, HEIs should be made accountable to constantly perform self-monitoring on the state of digitalisation. This self-monitoring task can be embedded within the HEIs' units or centres that oversee ICT matters together with the teaching and learning centre. Setting of timeline and milestones would help HEIs to identify the strengths and weaknesses of the state of digitalization and create actionable plans to stay on track.

WHERE DO WE GO FROM HERE?



FOR RELATED AUTHORITIES: IMPROVING ACCESSIBILITY FOR UNDERSERVED STUDENTS

Students continue to have difficulty accessing the internet, either because of connectivity challenges at their location or because of the high cost of access. The related authorities should play their role in widening access to education especially for underserved students. This can be done by expanding internet coverage including at remote areas, upgrading the internet speed, low cost devices for internet access and affordable data plan package that can ease students' burden in maintaining the cost for online learning.

Governments, industries and HEIs must work together to ensure an equitable solution to the potential digital divide as we march on to embed e-learning across the whole online learning journey. This has to be well coordinated to deploy resources and monitor the progress. This will ensure online learning blends seamlessly with life and work, bridging the boundaries between formal and informal/nonformal learning. Information and Communication Technology (ICT) will eventually be a universal staple in the provision of greater flexible learning opportunities for all.

It is hoped that the launch of Malaysia Digital Economic Blueprint - MyDigital (2021) as a national initiative which symbolises the aspirations of the Government, can successfully transform Malaysia into a digitally-driven, high income nation and a regional leader in digital economy with equal access to digital infrastructure and info structure where no one will be deprived and marginalised. This will also promote social mobility and widen opportunities for access to higher education.

WHERE DO WE GO FROM HERE?



FOR RELATED AUTHORITIES: SHARING OF RESOURCES ACROSS INSTITUTIONS FOR STUDENTS' LEARNING

An improved culture of sharing among HEIs is necessary. Currently Ministry of Higher Education (MoHE) have been promoting sharing of resources among HEIs in the form of library access and sharing of facilities such as computer labs, equipment or science laboratories. HEIs should be more proactive in practicing collaborative efforts to enhance campus experience and flexibility in learning unlimited by a single HEI campus experience.

The implementation of artificial intelligence (AI) such as an online library concept for educators (Doughty, 2021) together with teaching resources sharing through open educational resources (OER) (Sandanayake, 2019) and open courseware (OCW) (Kayal et al., 2017) are the examples of utilizing cloud computing technology in education that can also empower sharing.

WHERE DO WE GO FROM HERE?



FOR LECTURERS: PARTICIPATION IN UPSKILLING AND RESKILLING PROGRAM TO BE COMPETENT IN ONLINE TEACHING

A successful digital culture requires attitudes, values and behaviours to change and reflect the digital transformation agenda. Enhancing digital talent will comprehend the national digitization strategy which later serves as a growth multiplier to the nation thus integrating digital technologies into all areas.

Many professional teaching training have focused on face-to-face teaching, whereas teaching online necessitates a different skill set. Because there is no physical, emotional, or cognitive presence online, effective instructional planning is required. As a result, lecturers must be retrained and upskilled in order to be more capable of creating, delivering, and monitoring online learning while also keeping track of students' academic progress.

Certification and credentialing for lecturers to upskill and reskill can also be made available to boost lecturers' motivation to participate in training programs. It is also important to note that there are academics having difficulties delivering teaching because of too much focus on research, thus affecting the quality of teaching and learning (Sani, 2019). Hence, to sustain the digitalization of teaching and learning, online teaching needs to be embraced by giving similar emphasis such as research activities.

WHERE DO WE GO FROM HERE?



FOR STUDENTS: LEARNING HOW TO LEARN ONLINE

Unless specified in special programmes such as the Open and Distance Learning (ODL) Program, students enrolled in HEI academic programmes did not expect to learn entirely online. As a result, they are uninformed about online learning and lack the necessary skills.

Therefore, students must also have the appropriate skills and the right mindset which is important to ensure a smooth transition to an online learning environment. In fact, students' attitudes toward online learning will be influenced by increased awareness and understanding of the subject, resulting in improved performance expectations, social influence, and compatibility with online learning.

Students have to also be exposed to the flexibility offered in learning online through the expansion of a variety of knowledge areas and the growth of the number of courses offered online in the name of MOOCs, Micro-credentials, Open Courseware which amplified online learning experience.

They have to be informed that Malaysia HEIs recognized such learning path through the launch of Guidelines for Credit Transfer through MOOC (MQA, 2016) where students can collect the credentials and stack them to earn a degree at any HEIs of their choice. For example, 7 Malaysia HEIs have paved the way in offering flexible learning pathways through MOOC credit transfer such as UTeM, UTM, UMP, UPM, UPSI, UNISZA, and UNIMAS and many others yet to embark on the journey.

WHERE DO WE GO FROM HERE?

THE ROLE OF MINISTRY OF HIGHER EDUCATION

There are diverse ways for higher education institutions, related authorities, lecturers and students to adopt these recommendations for the betterment of digitalization of teaching and learning.

It is imperative that a concerted effort is established assisted by MoHE to ensure the following considerations for implementation; digital leadership awareness, governance of online learning, and finding the right balance between digital and traditional teaching and learning at HEIs.

In addition MoHE will also ensure that proper monitoring is in place to foster innovation by continuous quality improvement (CQI) through systematic measures, designing online learning with learners in mind and finally empower everyone to take charge for entire digital transformation.

CONCLUSION

Malaysia HEIs is not far behind and on the right track in the digitalization of teaching and learning. However, there are also many more areas of improvement such as taking up active roles to empower efforts in addressing issues of diversity and inclusivity, which is rather unique to Malaysia.

During the pandemic, we were able to observe that many HEIs were able to respond to the need for digitalization of teaching and learning but they have to be more attentive towards lecturers' needs as well as students' digital well being.

Finally, moving forward, HEIs and related authorities have to react by identifying low and high-priority initiatives so that they can be more strategic in approaching ways to digitally transform teaching and learning in Malaysia.



REFERENCES

Al-Kumaim, N. H., Mohammed, F., Gazem, N. A., Fazea, Y., Alhazmi, A. K., & Dakkak, O. (2021). Exploring the Impact of Transformation to Fully Online Learning During COVID-19 on Malaysian University Students' Academic Life and Performance. *International Journal of Interactive Mobile Technologies*, 15(5).

Corbett, A. T., & Anderson, J. R. (2001, March). Locus of feedback control in computer-based tutoring: Impact on learning rate, achievement and attitudes. In *Proceedings of the SIGCHI conference on Human factors in computing systems* (pp. 245-252).

Mansureh, K, Angie, L & Santiago, Lilia (2017), Issues and Challenges for Teaching Successful Online Courses in Higher Education: A Literature Review, *Journal of Educational Technology Systems*, 46(1):4-29

Maqableh, M., & Alia, M. (2021). Evaluation online learning of undergraduate students under lockdown amidst COVID-19 Pandemic: The online learning experience and students' satisfaction. *Children and Youth Services Review*, 128, 106160.

Doughty, Richard. "The Future of Online Learning: The Long-Term Trends Accelerated by Covid-19." 16 Feb. 2021, www.theguardian.com/education/2021/feb/16/the-future-of-online-learning-the-long-term-trends-accelerated-by-covid-19.

Sandanayake, T. C. (2019). Promoting open educational resources-based blended learning. *International Journal of Educational Technology in Higher Education*, 16(1), 1-16.

Kayal, S., & Das, B. (2017). E-learning system of Asia through open courseware (OCW) and educational resources (OER) for universal access to knowledge and information. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT)*, 12(2), 43-54.

Sani, R. (2019, August 14). Is University Research Good for Teaching. Retrieved April 29, 2021, from <https://www.nst.com.my/education/2019/08/512695/university-research-good-teaching>

Filius, R. M., de Kleijn, R. A., Uijl, S. G., Prins, F. J., van Rijen, H. V., & Grobbee, D. E. (2019). Audio peer feedback to promote deep learning in online education. *Journal of Computer Assisted Learning*, 35(5), 607-619.

Wei, H. C., & Chou, C. (2020). Online learning performance and satisfaction: do perceptions and readiness matter?. *Distance Education*, 41(1), 48-69.

Hofer, S. I., Nistor, N., & Scheibenzuber, C. (2021). Online teaching and learning in higher education: Lessons learned in crisis situations. *Computers in Human Behavior*, 121, 106789.

Gauthier, T. (2020). The value of microcredentials: The employer's perspective. *The Journal of Competency-Based Education*, 5(2), e01209.

LIST OF COMMITTEE

Dr. Nurbiha A Shukor
Universiti Teknologi Malaysia

Assoc. Prof. Dr. Wan Zuhainis Saad
Academic Excellence Division,
Ministry of Higher Education

Prof. Dr. Abd Karim Alias
Universiti Sains Malaysia

Prof. Ts. Dr. Mira Kartiwi
International Islamic University Malaysia

Prof. Dr. Andy Liew Teik Kooi
HELP Universiti

Mdm Ainil Nilam Mohd Mokhtar
Malaysian Qualifications Agency

Mr Chuah Kee Man
Universiti Malaysia Sarawak

Dr. Mohd Hafiz Abu Hassan
Universiti Sains Islam Malaysia

Mr Zamrin bin Salim
Malaysian Qualifications Agency

Dr. Nor Omaima Harun
Universiti Malaysia Terengganu

Assoc. Prof. Dr. Azidah Abu Ziden
Universiti Sains Malaysia

Mr Nik Naharudin Mohd Nasir
Malaysia Digital Economy Corporation

Mdm Lilian Kek
Malaysian Qualifications Agency

Assoc. Prof. Dr. Mohammad Najib Jaffar
Universiti Sains Islam Malaysia

Mdm Noor Hasniza Mat Salleh
Principal Assistant Director,
Academic Excellence Division,
Ministry of Higher Education

Ms Nor Nadiya Marjuki
Assistant Director
Academic Excellence Division,
Ministry of Higher Education

ACKNOWLEDGEMENT

The 2021 White Paper on Democratizing Higher Education through Digitalization of Teaching and Learning: Where Should We Go Next? is a collaboration between the Ministry of Higher Education, Malaysia and Malaysia Qualifications Agency (MQA) to drive digital learning in Malaysia.

The research behind the White Paper is conducted by the researchers team appointed by the Ministry of Higher Education, Malaysia (MoHE) for the research entitled “Quality of Online Learning during COVID-19 pandemic”. The strong support from MoHE’s team and MQA’s team is gratefully acknowledged and appreciated.



MINISTRY OF HIGHER EDUCATION

Department of Higher Education
Ministry of Higher Education,
Jalan P5/6, Presint 5, 62200
Putrajaya, Wilayah Persekutuan
Putrajaya.



9 789671 970614