Remote Learning During The COVID-19 Pandemic: A Preliminary Study of Digital Literacy Competencies Amongst Students in Higher Education

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Abstract: *Higher education institutions use a blended learning approach that combines face-to-face and online learning to improve students' learning. There was a rapid shift to remote learning due to the suspension of face-to-face learning activities due to the spread of COVID-19 in Malaysia. As a result, students must be digitally literate to improve their remote learning sessions. On the other hand, some students are less aware of the importance of digital literacy. Thus, a preliminary study was conducted to determine undergraduate students' digital literacy competencies. A survey was completed by 66 students enrolled in two academic courses. An online questionnaire was distributed during the 2020/2021 academic session. According to the findings, the majority of students live in rural areas and participate in remote learning sessions using mobile hotspot connections in addition to fibre broadband. The students demonstrated adequate digital literacy competencies throughout the remote learning sessions based on preliminary findings. Students are encouraged to upskill to improve their knowledge of the most recent digital technologies, allowing them to use the most recent digital technologies in their learning and future workplace.*

Keywords: online learning, e-learning, digital skills, digital technology
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1. Introduction

In Malaysia, Higher Learning Institutions (HLIs) have a blended learning environment that combines face-to-face learning with various information and communication technology (ICT) approaches such as online learning portals and online discussion platforms to create effective and accessible learning. The COVID-19 Pandemic compelled HLIs to move postgraduate and undergraduate courses online, a practice known as remote learning. Moodle, among other platforms, is used for remote learning and teaching. Webex, Microsoft Teams, Zoom, and Google Classroom are some platforms used for online lectures to ensure interaction between lecturers and students.

According to a recent study in India, using Google Classroom in teaching and learning sessions is beneficial during the COVID-19 situation in India (Sharda & Bajpai, 2021). In addition, due to the remote learning circumstances, a higher education institution in Saudi Arabia used Google Classroom and Google Hangouts during online learning sessions (Almusharraf & Khahro, 2020). The platforms used for remote learning in Malaysia are chosen based on the needs of the students and the availability of ICT infrastructure. Some lecturers must rely on

WhatsApp Messenger and Telegram to complement remote learning platforms to communicate with students in rural areas that lack Internet access.

The situation raises new questions about whether students have adequate digital literacy skills to participate in remote learning processes. Furthermore, one of the primary causes of the digital divide is a lack of adequate digital literacy skills (Tomczyk et al., 2020). Furthermore, several authors have emphasised the significance of digital competences for learning during the Pandemic (Moliner et al., 2021). Competences are a set of knowledge, skills, and attitudes related to the use of digital devices (Araujo-Vila et al., 2020; Janssen et al., 2013). The term digital competencies, which is a synonym for competences and skills, is used in the context of this study.

The ability to use ICT for learning is referred to as digital literacy (Maphosa & Bhebhe, 2019). It consists of various skills required in today's rapidly evolving digital environment (Komlayut & Srivatanakul, 2017; Tejedor et al., 2020). It involves, for example, competencies in selecting and utilising information obtained digitally via the Internet (Sa & Serpa, 2020).

Given the growing importance of digital literacy and the challenges associated with remote learning implementation in Malaysian HLIs, the purpose of this preliminary study is to understand better the digital literacy competencies acquired by students at a university in Malaysia's Northern Region. As a result, the findings of this paper provide some insight into digital literacy competencies during remote learning sessions, which helps plan post-pandemic online learning sessions.

The remaining paper is structured as follows: The following section discusses the literature on remote learning and digital literacy. The research methodology is then described. The section that follows discusses the analysis and discussion of the results. The final section contains the findings and recommendations for future research.

2. Literature Review

From blended learning to remote learning during the COVID-19 Pandemic

The COVID-19 Pandemic has created challenges and disruptions in HLIs worldwide. As a result, the teaching and learning methods at Malaysian HLIs are shifting from blended to remote learning. Lecturers and students alike had to adjust to the new normal. The main implications seen as a significant challenge for lecturers conducting remote learning are students' Internet accessibility and the stability of the teaching platform. Even when issues with accessibility or platform technology are encountered, dealing with these changes can be difficult for students with limited or no prior remote learning experience (Martzoukou, 2020).

One of the essential aspects of remotely delivering lectures is student Internet access. Lecturers must determine the Internet access coverage for each student in the course to select the appropriate teaching platforms to allow the lectures to be run remotely. The chosen platforms should assist students in areas with limited Internet coverage to avoid disruptions such as screen freeze distracting students during remote learning lectures.

If Internet access is limited, platforms such as WhatsApp and Telegram could be used to teach. A combination of Moodle learning platform and web conferencing platforms such as Webex, Microsoft Team, and Zoom is appropriate for medium and high Internet access. To improve students' learning experiences during remote learning sessions, different teaching methods

must be implemented using various platforms based on the type of Internet access they have. Al-Karaki et al. (2021) supports the approaches, implying that teaching styles vary depending on students' infrastructure during remote learning sessions.

Importance of digital literacy in remote learning
The ability of an individual to find, evaluate, and transfer information via a variety of digital platforms is referred to as digital literacy (Maphosa & Bhebhe, 2019; Kaeophanuek et al., 2019). Digital literacy is defined as an individual's ability to read and interpret data in the digital world to search for and evaluate information, think critically and creatively, and effectively collaborate with others (Yustika & Iswati, 2020; Zulkarnain et al., 2020).

In the field of information and communication technology, digital literacy refers to the ability of its users to use digital technology wisely to create constructive interactions and communication within an environment. Aside from that, digital literacy is one of the components of the learning environment in higher education. As a result, digital literacy can be defined as ICT use in learning (Maphosa & Bhebhe, 2019).

Accordingly, one of the essential competencies of digital literacy is students' ability to use available technologies to enhance various aspects of learning effectively. Another essential skill in digital literacy is managing and evaluating information, communication, and collaboration in digital technology learning (Maphosa & Bhebhe, 2019; Dewi & Purmadi, 2021).

Thus, we must provide students with digital literacy knowledge and skills to prepare them for the increasingly advanced digital technology wave as the world undergoes drastic changes to adapt to the new normal caused by the COVID-19 Pandemic. The new normal has increased ICT use, mainly digital technology, in higher education remote learning.

3. Research Methodology

This preliminary study's population consists of students enrolled in two academic courses. The sampling technique chosen was purposive sampling because students participate in the enrolled courses remotely from their homes throughout the remote learning sessions.

First, the students must complete an activity to determine their location and Internet access. Then, an online survey was administered to assess their digital literacy skills. The online questionnaire includes demographic information and a section on digital literacy competencies.

The digital literacy competencies measurement was based on the Ozdamar-Keskin, Ozata, Banar and Royle (2015). The online questionnaire was created and distributed through the two courses' Telegram groups. In the first semester of the 2020/2021 academic session, 66 responses (93% response rate) were collected.

4. Results and Discussion

In the first week of the First Semester (2020/2021) academic session, a feedback activity was conducted via Moodle. Students enrolled in two academic courses must take part in the activity. The activity's goal is to determine students' locations and methods of accessing the learning portal throughout the semester of remote learning. According to the feedback, most students are in rural areas during the academic session.

The means students use to access the learning portal during remote learning sessions is illustrated in Figure 1. Most students (45%) use fibre broadband and mobile hotspot connections (38%). Some students (11%) use campus Wi-Fi, while only 6% use broadband. According to the feedback, most students have average Internet access for the remote learning sessions. This finding is consistent with the rate of mobile broadband use reported in the Malaysian Communications and Multimedia Commission's (MCMC) Internet Users Survey 2020. (2020). Students prefer mobile hotspot connections because service providers offer competitive mobile broadband packages and smartphones support mobile tethering, which allows them to access the Internet on other devices (Malaysian Communications and Multimedia Commission, 2020).
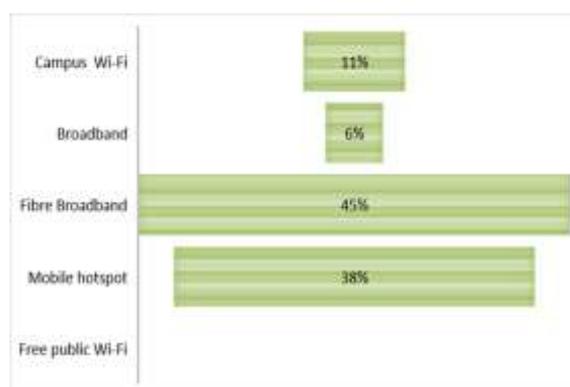

Figure 1: Means to access learning portal throughout remote learning

The digital literacy competencies survey was later distributed. Sixty-six undergraduate students responded, with 17 (26%) male students and 49 (74%) female students. The academic programmes of the participants are diverse. Table 1 summarises the demographics of the respondents.

Table 1: Demographic profile

Demographic item	Frequency (n = 66)	Percentage (n = 66)
Gender		
Female	49	74%
Male	17	26%
Year of Study		
First-year	47	71%
Second-year	10	15%
Third-year	8	12%
Fourth-year	1	2%
Programme		
Bachelor of Science in Information Technology with Honours	10	15%
Bachelor of Science (Hons.) (Multimedia)	25	38%
Bachelor of Science Economics (Hons)	1	2%
Bachelor of Tourism Management with Honours	22	33%
Bachelor of Public Management with Honours	7	11%
Bachelor of Event Management	1	2%

Table 2 shows the descriptive statistical analysis of the student's perceptions of their digital literacy competencies. According to the dimensions described by Ozdamar-Keskin, Ozata, Banar, and Royle (2015), the competencies have been divided into four indicators: digital learning tools, digital learning platforms, advanced digital tools, and security and ethics. The

Overall Literacy has been determined in the context of this preliminary study as a total combination of the dimensions. According to Reddy, Sharma, and Chaudhary (2020), any improvement on the competency indicator significantly improves students' Overall Literacy. The mean, median, mode, and standard deviation were calculated for the descriptive analysis. They are calculated using the values associated with the variables: 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, and 5 for strongly agree.

Table 2: Descriptive analysis

Indicator	Mean	Standard Deviation
Digital learning tools	3.80	0.61
Digital learning platforms	3.62	0.55
Advanced digital tools	3.08	0.61
Security and ethics	3.78	0.61
Overall Literacy	**3.49**	0.45

The mean for Overall Literacy is 3.49, according to Table 2. As a result, it is possible to conclude that the students who took part in the survey demonstrated adequate levels of digital literacy throughout the remote learning sessions. Similarly, Katsarou's (2021) recent research on undergraduate students in Greece reveals an acceptable level of digital literacy proficiency for participation in an online learning environment. Accordingly, Lamanauskas and Makarskaite-Petkeviciene's (2021) research findings show that students' digital competencies are improved during distance studies because of the need to use various digital platforms remotely.

Figure 2 shows the student distributions of digital literacy competencies. The results show that advanced digital tools have the lowest level of digital literacy competence. As a result, students must upskill themselves to increase their knowledge while minimising skill gaps to be better equipped with an increased need for ICT skills, particularly those related to the most recent technologies. Indirectly, the students will prepare for the worlds of work that await them after COVID-19. It is consistent with Nisha and Varghese's (2021) recommendation that ICT is essential in work environments and knowledge dissemination in today's society.
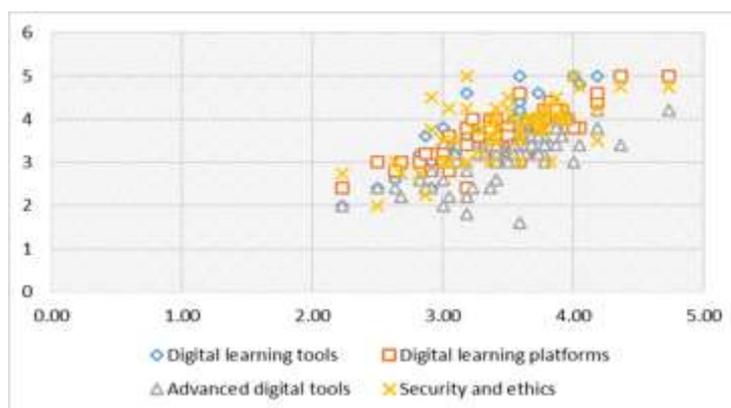

Figure 2: Digital literacy competencies

Furthermore, the findings supported a study by Araujo-Vila et al. (2020) that claims students are unaware of how to use advanced Office applications functions (text processors and spreadsheets) and specialised search engines. Moreover, technological proficiency will impact students' academic performance (Yaseen et al., 2021).

Finally, the preliminary study results in a digital literacy competencies pattern, as shown in Figure 3. A good distribution of digital literacy patterns shows that students can participate in remote learning sessions because they are knowledgeable in various aspects of digital literacy "due to the general high technical literacy of modern digital natives" (Almazova et al., 2020). As a result, this finding implied that most students are prepared for online learning. Accordingly, it agrees with Karatas and Arpaci's (2021) analysis of students' 21st-century skills and readiness for online learning.
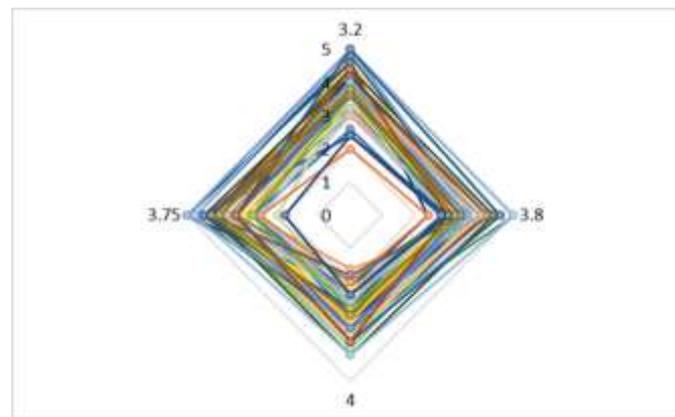

Figure 3: Digital literacy competencies pattern

5. Conclusion

The ability to find, evaluate, and share information using ICT, primarily digital technology, is referred to as digital literacy. With the increased use of digital technology, the concept of digital literacy will continue to evolve. The Covid-19 Pandemic has urged the global adoption of a new practice. Furthermore, higher education must transition from blended learning to remote learning to align with the new normal. As a result, students must be educated on the significance of digital literacy skills to facilitate remote learning sessions via ICT.

This study revealed a good distribution of digital literacy patterns during the remote learning sessions. The use of advanced digital tools, on the other hand, is revealed to be the least digital literacy competency. As a result, upskilling is critical to provide students with relevant competencies that will be useful in the future.

There are some limitations to this study. First, the respondents in this study were students who participated in two academic courses via remote learning sessions. As a result, the results should be interpreted with caution because the respondents are limited to the context of the specific academic courses chosen for the study. Second, the patterns of digital literacy competencies generated herein are based on respondents' perspectives on the four digital literacy competencies indicators described by Ozdamar-Keskin, Ozata, Banar, and Royle (2015). More research with a larger sample size is needed better to understand students' digital literacy competencies in higher education. Future research should also be conducted to identify the most recent digital literacy indicators relevant to technological advancements.

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