ICIS2022Penang

Influence of Digital Literacy on Learning Engagement among Secondary Students in Malaysia

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Abstract
Digital literacy is essential in 21st learning as technology has been embedded in the school curriculum. However, studies found that students still lack digital literacy skills in managing their education purposes, especially during Pandemic Covid 19. Therefore, this paper aims to examine the influence of digital literacy on student learning engagement. Survey questionnaires have been distributed among secondary school students in Malaysia. Findings show that students have good digital literacy, and factors such as socio-cultural is the highest score, followed by learning environment and individual factor.

Keywords: Digital Literacy, Learning, Engagement, Student

1.0 Introduction

The globe was confronted with a new pandemic threat in the first quarter of 2020 called COVID 19. Schools and millions of students find it difficult to adjust to online learning. COVID-19 has forced us to reshape learning styles and educational approaches geared toward 21st-century learning and teaching techniques. For most higher education institutes, the effect of this new norm is transitional as most are equipped with digital facilities that can support flexible approaches from pedagogy to heutagogy. However, it is a different situation for schools that engage with students through traditional or face-to-face learning. The current pandemic situation is driving students, teachers, and parents to be more creative, collaborative and flexible in their approaches and attitudes towards teaching and learning. Students need to be able to think critically as well as approach problem-solving needs differently. Studies have found that the greatest challenge to students' digital learning remains their lack of digital literacy, even if they are exposed to computer science education in school or maybe tech-savvy. In addition, various internal and external factors need to be considered with questions such as who has access to mobile gadgets and data, who has what it takes to self-direct their learning and whose parents have the opportunity to support these changes. This concern has become more important, especially in developing countries. It needs to be highlighted to the government and policymakers, with proper guidelines regarding the readiness and preparedness of digital literacy among students, especially in times of future uncertainty. Digital Competency Standards have been widely introduced throughout the country to strengthen the transformation of Education in the digital age. The curriculum has also been integrated with the use of Information and Communication Technology (ICT) but previous literature reviews show that students still lack digital literacy skills (Shuhidan et al. , 2019; Abd Jalil et al, 2021) which there

are still digital literacy components that need attention such as technological skills, information skills as well as ethical skills. Ala- Mutka (2013) suggests that all digital components and competencies must be assessed to support student teaching and learning. Studies have uncovered issues of environmental instability, safety, trust, and privacy users use the Internet to find information in their learning environments. Kusumarani et al, (2018) claim that the development of ICT, creates a lot of information that makes it difficult for students to separate truth and "Hoax" information, which causes less motivation in learning. The OECD, Programme for International Student Assessment (PISA) in the year 2018 examined what students know in reading, mathematics and science and found an increased rate of students who were considered to have high competence with the ability to use the Internet efficiently. However, students only have computer proficiency but are still less efficient in finding information (cognitively) from the Internet. (Shamila, 2019). Damara, (2018), in his study, has found that virtual or self-learning requires digital literacy for students and teachers, and it is still a challenge for them. This is supported by the study of Abdullah, Malik, Shaadan & Lokman, (2022) that during Pandemic Covid 19, students are less prepared in virtual learning. The challenges stated are computer/Internet readiness, self-learning readiness, and learning readiness motivation. Both the duration of online learning and the number of assignments were related to parental satisfaction, for which they stated that children's ability to complete such learning independently should be considered. Eva, et.al (2021). Basic skills required in this new learning style concept: digital literacy skills, information skills, problem-solving skills, visual media skills, as well as psychological and emotional competence (Abd.Jalil et.al, 2021). Therefore, the aim of this paper is to investigate the digital literacy level and learning engagement among secondary school students in Malaysia.

2.0 Literature Review

Today's students are taught how to use the Internet and applications for learning. Nevertheless, given students' regular exposure to digital technology like computers, mobile phones, video games, and the Internet, educators frequently presume that most students today are digital natives (Bărbuceanu, 2020). However, not all students are digital native and have the competencies to use the technology effectively in obtaining information needed for academic tasks (Shuhidan et al, 2019; Orsu, 2017). Most students lack the self-efficacy to learn something new that could help them perform in academics. On the other hand, visuals and graphics make students want to navigate further into a digital content site, Kim (2019). Students who lack correspondence between their self-efficacy beliefs and performance are considered poorly calibrated.

Schools extensively create an effective 21st-century learning environment in the classroom to enhance the teaching-learning process, either for physical or virtual learning (Shuhidan et al, 2019). In addition, the lack, or low quality, of facilities and connectivity in schools threatens to amplify student disadvantages (Hebebci, Bertiz & Alan, 2020). Without infrastructure and connectivity, the integrated system (encompassing web-based courseware, online management tools, and technical support that enables learning technology and culture) provided by the school project is not accessible to rural schools. Therefore, it does not accurately reflect the student's digital competence or guarantee excellent results. Therefore, infrastructure and technology use in schools is important as a key enabler for digital technology-based Education and for improving teaching and learning. Besides, the problem comes from the lack of teachers' competencies and the teaching style in the classroom. Students see first-hand when teachers lack digital literacy, which can create a disconnect that hampers the development of digital culture, Abd Jalil et.all (2021). The fact that these skills have never been the focus of traditional education is a serious problem.

Study has underlined the significance of the home environment in promoting and supporting the development of safe and risky online behaviour. Family support is also one of the important ecological contexts of development. However, the significance of these influences is currently largely underappreciated. Recent research highlights the importance of considering parental use and family practices concerning the use of technology such as computers, tablets, mobile phones, and game consoles within the home (Modecki, Goldberg, Wisniewski, & Orben, 2022). Parents sometimes overlook the significant impact their child's exposure to technology has on them. In this situation, families need to be supportive and familiar with the platforms and tools as well as the pedagogical demands of online learning that they never had to think of in conventional delivery.
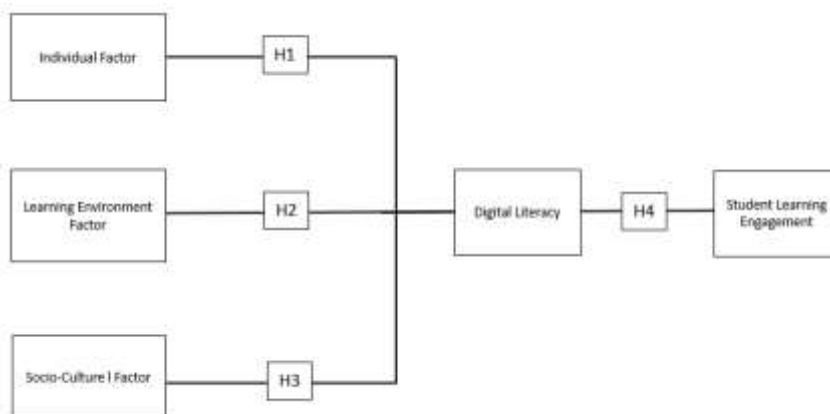

Fig. 1: Theoretical Framework

In developing these alternative arrangements, a primary consideration has been to ensure that students can progress in their programme of study and ultimately prepare for the examinations. Students also lack digital literacy skills and less knowledge to learn a new approach. Therefore, it is high time to investigate the level of digital literacy skills among students and what are the internal and external factors influencing their digital literacy. According to Bawuro (2018), digital literacy is needed to prepare students for future employment adequately. The school must respond to dynamic processes by developing innovative classroom learning environments or by changing work structures and processes within and outside the school environment. Hartman's (2019) study found that educators understand the need for technology integration in the classroom. After careful consideration, Figure 1 depicted the research framework for this study, namely; individual factors, learning environment factor, socio-cultural factor as independent variable and student learning engagement as dependent variable.

3.0 Methodology
To gather information for the study's analysis of the factors influencing digital literacy and learning engagement, a survey online questionnaire was employed as a quantitative research approach for data collecting. Each variable was evaluated using the following Likert scale: (1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly Agree. For each item, the respondents were asked to rate their level of agreement or disagreement. The questionnaire was modified accordingly to input and suggestions during the pre-test before being distributed to the targeted respondents.

The study population is students from selected secondary schools in Malaysia after getting approval from school principals. The researchers used convenience sampling, a method of nonprobability sampling for the collection of population samples. Convenience sampling is often used during the exploratory phase of research and perhaps is one of the most suitable methods of getting information quickly and efficiently (Sekaran & Bougie, 2016). In addition, Ali and Buang (2016) noted that a non-probability sampling is thought to be the most suited when the goal of a study is to verify proposed theoretical assumptions rather than for population generalisation. Descriptive analysis and Partial Least Square Structural Equation Modeling (PLS-SEM) were employed in the study to analyse the data and provide findings. The descriptive analysis was carried out using SPSS Version 26.0, while the PLS-SEM analysis was done using SmartPLS Version 3.0. The two stages of the PLS-SEM analysis were the evaluation of the measurement model in the first stage and the structural model in the second.

4.0 Results and Discussions

4.1 Common Method Bias (CMB)
Harman's single factor score is being used to test CMB. Harman's test of all items (measuring latent variables) is loaded into one common factor. If the total variance for a single factor is less than 50%, it suggests that CMB does not affect the data, hence the results. For this study, all items from all constructs were entered for analysis and constrained to only a single factor. The results showed that the single factor explained only 33.1%, less than the benchmark value of 50% of the total variance, indicating that common method bias was not a likely contaminant of the research.

4.2 Demographic Profiling
Out of 2021 respondents, 1430 (67.5%) of the respondents are female students, and 690 (32.5%) are male students. Apart from that, the age differences of the students involved in this study. The most dominant age of the respondents was between 16 years old (24%), followed by 13 years old (23.1%), and 15 years old (19.7%). Meanwhile, 14 and 17 years old were 18.3% and 15% respectively. In this study, the form of the respondents was also recorded. Students from form 4 (n=512, 24.2%) represented the highest number recorded, followed by form 1 (n=487, 23%), form 3 (n=416, 19.6%), form 2 (n=387, 18.3%) and form 5 (n=318, 15%).

4.3 Descriptive Analysis
Table 1 shows the present study's mean and standard deviations for each variable. Respondents were asked to indicate their opinion on the individual, learning environment, socio-culture, digital literacy and students learning engagement. The students strongly agreed that they were highly satisfied with their digital literacy skills, evidenced by the highest mean score of 3.93 out of 5.0 points and a standard deviation of 0.732 for digital literacy. Socio-culture and learning environment recorded mean scores of 3.82 and 3.79 out of 5.0 points with standard deviations of 0.930 and 0.859, respectively. Regarding individual factors and student learning engagement, the recorded mean is 3.77 and 3.57, respectively. This study shows that among the variables, student learning engagement gives the lowest mean value with 3.57. This indicates that students during pandemic COVID-19, need support from friends in their learning process as has been mentioned by Moon and Ke (2020,) that students' low work efficiency and low learning engagement were caused by their peer relationships, which lacked intentional and knowledge-constructive collaborations.

Table 1. Descriptive analysis of constructs

	Mean	Standard Deviation
Individual Factor	3.77	0.799
Learning Environment Factor	3.79	0.859
Socio-Culture Factor	3.82	0.930
Digital Literacy	3.93	0.732

Student Learning Engagement	3.57	0.933

4.4 Measurement Model Assessment

The assessment findings for the measuring model are displayed in Table 2. The measurement model was evaluated using three criteria: factor loading, composite reliability (CR), and average extracted variance (AVE). The indicator loading for indicator reliability was suggested at 0.708 or higher (Memon, Ramayah, Cheah, Chuah & Cham, 2021). However, loading levels that are > 0.7 (Hair et al., 2017), 0.6 and 0.5 (Byrne, 2016) are adequate if the AVE and CR are complemented by other items that have high scores of loadings. The CR and AVE benchmarks are 0.7 and 0.5, respectively. The findings in Table 2 imply that each of these requirements has been satisfied, which suggests that the measurement model's convergent validity can be assumed.

Table 2. Measurement Assessment Model

Construct	Items	Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
Digital Literacy	DL1	0.813	0.911	0.671
	DL2	0.814		
	DL3	0.840		
	DL4	0.827		
	DL5	0.798		
Individual Factor	IF1	0.749	0.841	0.514
	IF2	0.726		
	IF3	0.721		
	IF4	0.696		
	IF5	0.692		
Learning Environment	LE1	0.714	0.811	0.518
	LE2	0.648		
	LE3	0.758		
	LE4	0.670		
	LE5	0.634		
Socio-Culture	SC1	0.641	0.785	0.552
	SC2	0.625		
	SC3	0.614		
	SC4	0.704		
	SC5	0.757		
Student Learning Engagement	SE1	0.724	0.866	0.564
	SE2	0.720		
	SE3	0.791		
	SE4	0.761		
	SE5	0.756		

4.5 Structural Model Assessment

Four hypotheses were developed to answer the research questions. During the structural analysis of the model, all hypotheses were tested. Based on Table 3, all hypotheses in this study are supported. This indicates that all variables: individual factor, learning environment and social-culture have a significant impact on the digital literacy among secondary school students in Malaysia. Study by Kusumarani & Zo (2018) claims that digital literacy is a must and should be embedded in the curriculum with the good facilities and conducive learning environment.

Table 3. Results of Path Analysis and Outcome

Hypothesis	Relationship	(O)	(M)	(STDEV)	T-Values	P-Values	Decision
H1	Individual Factor -> Digital Literacy	0.241	0.242	0.025	9.767	0.000	Supported
H2	Learning Environment -> Digital Literacy	0.342	0.340	0.025	13.839	0.000	Supported
H3	Socio-Culture -> Digital Literacy	0.263	0.265	0.025	10.484	0.000	Supported
H4	Digital Literacy -> Student Learning Engagement	0.488	0.487	0.020	24.260	0.000	Supported

5.0 Conclusion

Digital transformation and Pandemic Covid 19 highlighted the need for digital literacy among students to be independent in a virtual learning environment and to prepare for the needs of the field of employment in the future. In addition, skills for preparation towards industry 4.0 need to be developed early in the learning process to produce students holistically. From the findings, it shows that all the independent

variables namely; individual factor, learning environment and socio-cultural have significantly influenced student learning engagement. Future research can be explored using the qualitative approach to investigate the individual factors of students behavior towards learning engagement through digital literacy task setting. As this study only covers secondary school students, future research also may consider primary school students setting. It is hoped that this research will provide a baseline for framework development of students' digital literacy competency in supporting the Malaysia Education Blueprint 2013-2025 and Sustainable Development Goals by UNESCO 2030, (SDGs 4) quality education.

Acknowledgements

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