



The Effect of Online Learning on Student Engagement: An Investigation Conducted with Respect to University Students in Malaysia

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Abstract. Online learning has been implemented within most education systems around the world in the wake of the COVID-19 pandemic. However, the online learning transition has posed critical challenges for students of all educational levels, inclusive of universities. The purpose of this study is to examine the effect of online learning on student engagement among university students in Malaysia. The target respondents for this study are university students in Malaysia. Cluster sampling technique was used in this study; six public and private institutions were chosen based on the Times World University Ranking 2021. Data for this study was collected through the distribution of 389 questionnaires to students from the chosen universities. Multiple regression analysis was conducted to examine the theoretical framework established. The research results demonstrated a positive significant relationship between 2 independent variables (course design and digital literacy) and the dependent variable (student engagement). Two new discoveries were made in this study which will be contributed to future research. The findings of this study would be useful to the management of universities pertaining to improving policies and resources aiming at enhancing student engagement.

Keywords: Student engagement · Online learning · User friendliness · Course design · Digital literacy · Resource availability

1 Introduction

Education plays a role in enhancing the growth of people, institutions, and nations (Elumalai, Shankar, Kalaichelvi, John, Menin, Alqahtani & Abumelha, 2021). The outcome of the educational systems serves as the primary determinant of teaching quality. As a result, the system of education must be transparent for the students to comprehend the lecture notes. Since students are the last users of the product (education), viable tools must be assessed from their viewpoint. Educational institutions must provide a fun learning environment and collaborate closely with industries to bring cutting-edge concepts to the ever-changing world. Hence, online learning has become a turning point

in most countries' education systems, especially in Malaysia. Moreover, the COVID-19 pandemic is currently on the grounds for all countries to switch to an online study mode (Elumalai et al., 2021). Based on the statistics, 429 out of 25,000 universities in the world were fully closed and the rest were replaced their physical learning with online learning and online lectures.

Due to this situation, the educational system has experienced significant changes, with a significant growth in the employment of technology for distance teaching and learning which will be referred to as "online teaching and learning" in this study. The hasty transition to online teaching and learning has presented challenges for both lecturers and students. On the other hand, academics embrace this era of online learning despite the challenges that lecturers and students face while adopting it by offering electronics and internet connections to ensure that online learning systems run smoothly. Online learning has its advantages such as in the internet's adaptability, profitability, and simplicity in the procurement, retention, conveyance, and adaptability of data (Min Hu, Hao Li, 2017). Online learning can assist students in overcoming space-time limitations. Online learning is critical for student engagement which is defined as a student's quality of involvement and the student's effort towards activities that contribute to their achievements (Fatawi, Degang, Setyosari, Ulfa, and Hirashima, 2020). On the other hand, (Chiu, 2022) says that student engagement is also known as the student's active participation level to get desired academic success. Furthermore, online learning has its potential benefits such as time flexibility, environment and most importantly the pace (Salas-Pilco, Yang & Zhang, 2022).

Conversely, there are some major problems that have been faced by the students such as student's adaptability, lack of motivation, difficulties in completing group work, unsuitable environment, and lastly some of the students take flexibility in online learning for granted (Coman, Tiru, Schmitz, Stanciu & Bularca, 2020). The researchers believe that it is important for the authorities and the students to overcome these problems effectively. Upon solving the problems mentioned, the government will be able to implement the online learning systems in the future without the need for any physical classes.

The current learning environment among university students in Malaysia is attributed to the closure of universities in March 2020. Local universities engaged in heavy investments to enhance participation rate and reduce attrition rate (Abdullah, Arokiyasamy, Goh, Culas, Manaf, 2022). Universities have taken an active effort to set up teaching and learning (TNL) classes for lecturers to equip them with necessary skills on how to conduct seamless online classes. (Abdullah et al., 2022). The unplanned shift to online learning approach led to unexpected problems faced by the students. Lack of conducive environment to study, hardware and software issues affecting communication cycle and lack of mental preparedness to handle new learning environment (Nassr, Aborujilah, Aldossary, Aldossary, 2020).

2 Literature Review

2.1 Underlying Theories

Self-determination theory is a broad motivation theory that explains the dynamics of motivation that initially developed by Deci and Ryan (1985), as cited in Chiu (2022).

Self-determination theory is an important framework for addressing motivation in an online learning environment. As a driver of motivation, self-determination theory looks at autonomy, relatedness, and competence. When these three needs are satisfied, student will feel engaged in their academic study. Next, Self-efficacy theory postulates that people that have a high self-efficacy will work hard and endure in the face of challenges (Bandura, 1977, as cited in Hong, Liu, Cao, Tai and Zhao, 2022). Student with high self-efficacy is more engaged. Self-efficacy is the mindset that influences students' behaviour to engage in academic studies. Efficiency is required for effective learning to encourage engagement in current and future online activities.

2.2 Dependent Variable (Student Engagement)

Student engagement, defined as students' active participation in educationally effective activities and their dedication to learning, is a critical step towards highly desired educational outcome such as academic success (Chiu, 2022). Students that are engaged find learning enjoyable and meaningful thus devoting their time and effort towards it. The three components that comprise of multidimensional construct of student engagement are behavioural, cognitive, and emotional involvement (Reeve, 2013, as cited in Chiu, 2022).

Behavioural engagement is defined as a level of participation, effort, intensity, or perseverance in educational activities (Chiu, T.K. 2022). Cognitive engagement is the extent to which students are prepared and equipped to take responsibility for their own learning. Lastly, emotional engagement refers to how students feel about their lecturer, peers, the learning process, their coursework, and their sense (Fredricks, 2011, as cited in Ozhan, S.C., & Kocadere, S.A., 2020). All of these components are very important in student engagement which is an important influential factor in students' academic performance.

2.3 Independent Variable

Social interaction is required between students and lecturers to improve the quality of online learning. Educators must utilize technology wisely to promote student engagement in order to fully exploit the power information technology (IT) as a catalyst for producing successful candidates in universities (Ehrmann, 2004, as cited in Chen et al., 2010). However, issues in the adoption of IT in the education system have been further magnified after the recent shift from physical to online learning following the pandemic. In this case, the most common online learning issues discussed by several authors are user-friendliness, course design, availability of resource and digital literacy.

3 Independent Variable 1: User Friendliness

University students and lecturers are key users in the usage of online learning platforms (Ifijeh, Osinulu, Esse, Odeshi & Fagbohun, 2015). Universities have financially invested in the acquisition, installation and management of online learning platforms in

order to facilitate and enhance online learning and teaching (Ifijeh et al., 2015). “User-friendliness” explains the degree to which the user of the online learning platforms considers the education technology to be user-friendly based on their prior experience or continued usage of the platform (Choa, Ahmad, Yahaya, Mohd Fauzi, Yunos & Abidin, 2017).

Furthermore, the students who consider the online learning platform useful and easy to use are more inclined to adopt a positive attitude towards online learning. Hence, it is increasing their intention to use the online learning platform again on a daily basis. The functions of an online learning system should be constructed with flexible access in order to promote user friendliness for students (Nguyen, Pham & Hoang, 2020). In addition, it is also very important for a student to develop a positive attitude towards online learning platforms in order to pursue their studies effectively during online classes.

4 Independent Variable 2: Course Design

According to Fink (2007), the goal of course design is to provide students with more learning opportunities in an environment that respects and supports their intellectual development. A well-crafted online learning course design should include important elements such as instructional objectives, course details, course teaching plan and course learning outcomes in a clear and systematic manner, the students will perceive the online-learning system will benefit them and when the course is well-designed, it will motivate the students to use the online learning system and thus improve students’ online learning acceptance (Almaiah & Alyoussef 2019). Institutions need to provide course details such as expectations for assignments, due dates, coursework guidelines, assessment rubrics and also additional resources to accommodate their learning process (Gray & DiLoreto, 2016). Students are expected to take part more proactively in learning when the course design is more engaging and motivating the learning involvement.

In addition, the online learning content contains supplemental tools to assist students to understand the subject more clearly and deeply. Efficient course design is based on the fact that the programs themselves are the cornerstone of education (L. Dee Fink, 2010). Several students will be able to engage in richer life lessons that support successful learning if the design is effective. Coursework must set the backbone of student learning, whether it is education in general or program-specific instruction.

5 Independent Variable 3: Availability of Resources

In an online educational context, an online learning resource is a resource that is available on the Internet. The drawbacks of having lack of resources during emergency remote education include unfavorable learning environment, inadequate internet access and little exposure to online learning. During learning process, helpful tutors and clear learning materials are critical variables in increasing student engagement and course completion rates. It is crucial to determine if the availability of online learning resources effects a shift in learning engagement among students (Alshahrani, Ahmed & Ward, 2017).

Furthermore, learning resources can be defined as information that might be utilized to aid learners in accessing, recording, and learning materials. There are several learning

materials available, each with its own set of characteristics. First and foremost, resources might vary depending on where they are located. Secondly, learning resources can differ in the functions they provide. Some resources, like books, the Internet, and videos, serve as information repositories, whilst others, such as calculators and visualization tools, function as cognitive tools that aid learners in processing information. Withing information resources, further distinctions are possible such as primary and secondary resources (Jeong, H., & Hmelo-Silver, C.E., 2010).

6 Independent Variable 3: Digital Literacy

The phrase “digital literacy: has been broadened to cover all the specialized skills and competencies required for searching, locating, assessing and handling electronic information found that digital literacy is a non-quantifiable mix of power and competence, but allows for greater flexibility in data analysis, selection, and critical evaluation, while also individual liberty and respect and understanding for rights and duties are being raised (Calvani et al., 2009, as cited in Arono, Arsyad, Syahrman, Nadrah & Villia, 2022). It shows that digital literacy is not necessary to follow the procedure or limited to certain jobs.

Digital literacy includes digital skills as a significant component. Learners can grasp the extent of information channels and resources, acquire trust in the correctness, dependability and clarity of the information they receive, and greater control of their own learning as a result of the development of a variety of abilities. It should be highlighted that digital literacy includes more sophisticated critical and evaluative abilities that are frequently mentioned in media literacy literature in addition to computer skills (Vissenberg, J., d’Haenes, L., & Livingstone, S., 2022).

6.1 Conceptual Framework

Figure 1 depicts the conceptual framework of this overall research. The conceptual framework of this study consists of four independent variables (user-friendliness, course design, availability of resources and digital literacy) and one dependent variable (student engagement.) The framework was developed based on various past research from published and unpublished data and based on practical experiences and different online learning definitions. Moreover, the research model emphasizes the relationship between the independent variables and dependent variables.

6.2 Hypothesis Development

Online courses that are user-friendly are intuitive and highly engaging. Henderson, Selwyn, Finger and Aston (2015), cited in Ilin (2022) argues that the reason for failure in students’ adaptation to online learning technology is that the online learning systems are not designed for the ease and comfort of the user rather the user is expected to adapt to the system. Al-Marouf, Alnazzawi, Akour, Ayoubi, Alhumaid, AlAhbabi, Alnaimi, Thabit, Alfaisal, Aburayya & Salloum (2021) discovered that an online learning system which is scored high in ‘perceived ease of use’ that requires less effort, then the

Conceptual Framework

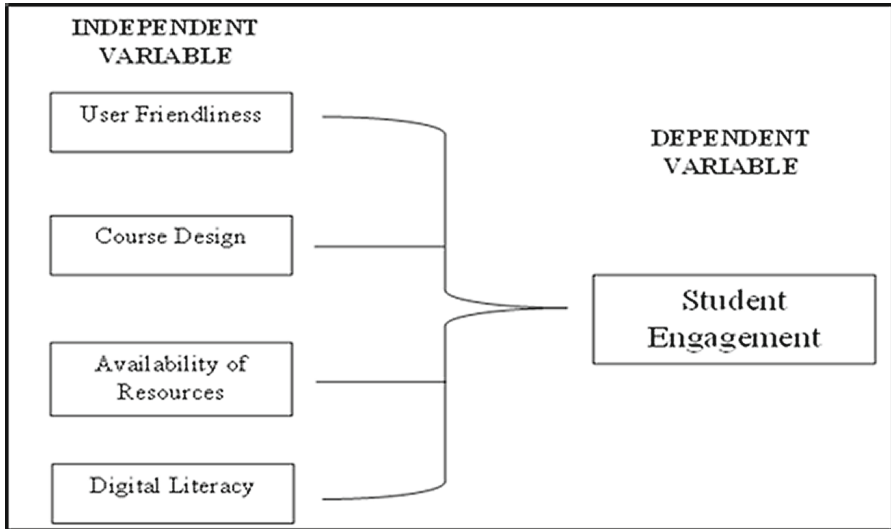


Fig. 1. Research Model

students would have the intention to continue to use the system, which will enhance student engagement. Moreover, there is a connection between poor student mental health and student engagement because if the students are unable to adapt to the new learning platforms it will cause a negative impact on the students' mental health which leads to the poor student engagement (Al-Kumaim et al., 2021). ***H₁: User friendliness has a positive relationship with student engagement.***

Educators have control over which online, intellectual, and material resources are used (Gedera, 2014, as cited in Tualualei, et al., 2021), but how they are used is what adds to efficient student engagement. Furthermore, if the course design is more rational and well-organized; it will boost the students' engagement during classes. In order to enhance students' academic performance and ongoing learning, lecturer should be clear about the course objectives for the assignments, due dates, rules, assessment rubrics, and resources. Quality on digital content prepared for the courses has a positive relationship with the engagement of students (Khlaif, Salha & Kouraiichi, 2021). ***H₂: Online learning course design has a positive relationship with student engagement.***

With help of good equipment, students can stay engaged in their study. With the aid of quality technology and dependable internet connections, students can stay on top of their work and stay engaged with their professors and classmates, which fosters a notion of competence support (Chiu, 2022). Moreover, lack of online resources and internet connections are the major issues faced by the students to attend their online classes (Nassr, et al., 2020). Some students had to borrow resources and equipment from the universities such as computers and broadbands to attend their classes. These kinds

of inconvenience affect the student engagement in online classes. **H₃: Availability of resources has a positive relationship with student engagement.**

Students possess digital literacy have a specific level of knowledge, mindsets, and skills that allow them to utilise the internet and related technologies and they are considered to be digitally savvy, Byungura et al., (2018) cited in Werang & Leba, (2022). In addition, integrating digital literacy into classes can enhance the student engagement during online classes. The benefit of incorporating digital literacy into the lessons is that it may enliven students' interest in otherwise dull or boring subjects (Sadaf & Johnson, 2017). Howard, Ma and Yang (2016) stated that the appropriate use of digital technology by students promotes engagement and fosters a good attitude toward universities. **H₄: Digital literacy has a positive relationship with student engagement.**

7 Research Methodology

7.1 Sampling Design

According to Ministry of Higher Education (2021), there are a total of 102,592 students in the 3 selected public universities and 3 private universities serve as our target population. The questionnaire survey method was used in this study to collect the primary data. Besides, secondary data was collected which included the use of books, online publications, academic papers authored by other researchers, and from library's Final Year Projects. In this research, we targeted university students from the top three private and public universities form the study's sample frame which are located at Penang, Perak, Johor, and Selangor state in Malaysia.

Furthermore, cluster sampling which classified under probability sampling is chosen in this research to identify the target respondents due to the large population of target respondents existing for this study. Data analysis will be conducted through the software SPSS. The Pearson correlation coefficient(r) is used to determine the correlation between two quantitative variables and identify the degree to which the two variables coincide with each other (Allen, 2017). Multiple regression analysis helps to determine the relationship between variables, the size of the effect, and likelihood that an intermediate occurrence on the effect of online learning that affects student engagement (Rubinfeld, 2011).

7.2 Research Procedure

Based on our study, we spread the questionnaire by using Google Form through social media platform such as WhatsApp, Facebook, Instagram, and Microsoft Teams. The survey was distributed in June 2022 and the researchers took 1 month to collect the planned survey responses. In July 2022 the researchers had successfully collected 389 surveys from the target respondents. The total surveys which are based on Krejcie and Morgan Table that have to collect a minimum 384 surveys. After collect the data, the

Table 1. Data Analysis Procedure

Research Design Determine the IV and DV
Population and Sampling Design Determine the population and calculate the sample size
Develop the measurement tool Prepare the Questionnaire
Pilot Study
Actual Study Send out survey link to Private Universities' lectures in Malaysia via Google Form
Data Collection Clean up the obtained respondent data and eliminate invalid data
Data Analysis Descriptive Analysis Frequency Analysis Pearson Correlation Analysis Multiple Regression Analysis Hypothesis Testing
Result

first step that must be taken is data verification. Following that, the data is modified by attempting to correct respondents' unauthorised, contradictory, incoherent, and overlooked responses. The third step is to code the data by allocating alpha and numeric codes to survey questions responses so that they can be listed in the record. The last step of the data processing involves uploading the data and entering it into a database using SPSS software after the coding phase is complete (Table 1).

8 Data Analysis

In this study, Pearson's Correlation analysis is used to investigate the correlation between the 4 independent variables and the dependent variable. Based on the results obtained, the researcher concluded that all the four independent variables in this study have a positive correlation with the dependent variable, student engagement (Table 2).

In addition, we used R-square model to understand the correlation coefficient between the dependent variable and the four independent variables. According to the R-square's Model Summary table, the correlation coefficient(R) of four independent variables (user friendliness, course design, availability of resources and digital literacy) with the dependent variable (student engagement) is 0.760. Therefore, we can conclude that there is a positive and high correlation between the four independent variables and dependent variable (Table 3).

Table 2. Pearson's Correlation

	Hypothesis	Pearson's correlation	Remark
H1	There is a significant relationship between user-friendliness of online learning platforms and student engagement.	0.596	Moderate
H2	There is a significant relationship between course design and student engagement.	0.657	High
H3	There is a significant relationship between availability of online learning resources and student engagement.	0.463	Moderate
H4	There is a significant relationship between digital literacy and student engagement.	0.720	High

Table 3. R-square's Model summary

Model	R	R-square	Adjusted R-square	Std. Error of the estimate
1	0.760	0.578	0.573	

Table 4. Coefficient Table

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.
	B	Std Error	Beta		
(Constant)	4.876	1.583		3.081	0.002
UF	0.149	0.081	0.096	1.839	0.067
CD	0.517	0.088	0.325	5.874	0.000
RA	-0.293	0.084	-0.169	-3.487	0.001
DL	0.879	0.086	0.536	10.173	0.000

^aDependent variable: Student Engagement

Note. UF = User friendliness, CD = Course Design, RA = Resource Availability, DL = Digital Literacy

9 Findings

Based on the coefficient table, the researchers we able to discover two new findings which is yet to be discovered by past researchers. Digital literacy and Course design are the first and second most significant independent variable in this study. Furthermore, digital literacy and course design contribute the first and second most to the variation in student engagement due to their respective beta values.

Two new discoveries were made with respect to the independent variables' user friendliness and availability of resources. In this study, user friendliness does not play a significant role in defining student engagement. The p-value for user friendliness is 0.067 (which is greater than the alpha value 0.01). Besides that, user friendliness contributes the second lowest variability in student engagement (beta values is second lowest at 0.096). Resource availability has a negative significant relationship with student engagement (with a negative beta value of -0.169) (Table 4).

10 Conclusion and Discussion

To conclude, two new findings were obtained that will be considered as a new discovery and a contribution to this field of topic. Each online learning variable (user-friendliness, course design, availability of resource and digital literacy) in our study has a positive correlation with student engagement. Currently, university students in Malaysia are going through a lot of issues; according to The Malaysian Reserve (2022), 85% of students prefer shorter study period in university due to financial concern. In regards of that, they prefer to continue their studies through online mode where it has a lower tuition fee. Secondly, there are some discussions going on in the cabinet about removing unnecessary courses offered in the universities. By taking this research into account, the current issues of Malaysia university students' engagement can be addressed. The policy makers (Ministry of Education) and academic institutions in Malaysia can address this issue by strengthening the online learning systems to contribute to higher student engagement levels. Besides, implications of study have been discussed to understand the meaning behind the findings obtained in the study. According to the research, student engagement significantly affected by the independent variables of the study.

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