

The Relationship between the Readiness and Acceptance of Technology with the Effectiveness of Online Learning among the Undergraduates of Sultan Idris Education University

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Abstract: This study aimed to examine the relationship between the readiness and acceptance of technology with the effectiveness of online learning among undergraduates of Sultan Idris Education University (UPSI). The conceptual framework of this study was constructed by referring to the Technology Readiness Index model with Technology Acceptance Model. This study adopted quantitative research through study design correlation. The selection of the study sample was carried out by simple random sampling involving 393 undergraduates at UPSI. Data collection was done by using a questionnaire that contained construct technology readiness and acceptance to use online learning methods towards the effectiveness of online learning. Descriptive statistics, Pearson correlation test, and linear regression were used in the analysis of the study data. The results showed that the levels of readiness and acceptance of technology with the effectiveness of online learning were moderate. The findings of the study also revealed that there was a significant relationship between optimism perception ($\beta = .59, p < .05$), discomfort perception ($\beta = .219, p < .59$), usefulness perception ($\beta = .329, p < .05$) and ease of use perceptions ($\beta = .158, p < .05$) towards the effectiveness of online learning. In conclusion, optimistic perception, discomfort perception, usefulness perception, and ease of use perception affect the effectiveness of online learning among undergraduates of Sultan Idris Education University, Tanjung Malim, Perak. Implications from this study, e-learning policymakers, the Ministry of Higher Education Malaysia (KPTM), and administrators of IPTA and IPTS can utilize students' views on the aspects studied and make the information a useful tool in further improving the effectiveness of online learning in Malaysia.

Keywords: Readiness, Acceptance, Online Learning.

INTRODUCTION

The use of technology in learning is one of the skills learned in the 21st century that must be mastered by students and lecturers. This is because the Malaysian Higher Education Development Plan (PPMPMT) 2015-2025 emphasizes the use of information technology and transformation in delivery during the teaching and learning process. For example, 21st-century learning is beginning to be used at all levels of learning, especially at the higher education level (Zulkifli, Hamzah & Abdul Razak, 2020). Online learning can also make students more informed in addition to allowing students the opportunity to have and improve skills throughout their lives (Zakaria et. al., 2020).

However, the use of online learning has not yet been fully adopted. This is because, there are various constraints whether from the institution, school, lecturers, students, and parents. For example, the lack of the latest technology tools in the learning area and unsatisfactory internet access. In addition, the method is not fully practiced because technological equipment such as projectors, educational television (TV), and tablets are very limited (Abdul Ghani et. al., 2019). Therefore, conventional learning is used to deliver the learning and facilitation process (PdPc) (Subramaniam & Mohd Hamzah, 2020).

Teaching and learning from home because of the COVID-19 pandemic not only disrupts the daily affairs of parents but also affects the life and learning of students. Furthermore, this new norm is still at an early stage and educators should find and diversify

their learning methods to ensure that the teaching and learning process continues even if it is entirely online (Harahap, 2019). This is to ensure that teaching and learning continue even if educators and students do not have to attend class to ensure that teaching and learning are not delayed and students are not left behind in their learning (Dennon, 2020). Therefore:

What is the level of technology readiness of students with the effectiveness of online learning during the COVID-pandemic?

What is the level of student acceptance of technology with the effectiveness of online learning during the COVID-pandemic?

Is there a relationship between student readiness and the effectiveness of online learning?

Is there a relationship between student acceptance and the effectiveness of online learning?

LITERATURE REVIEW

Online learning is also known as e-Learning, distance learning, web-based learning, and virtual learning. There are various definitions of online learning being talked about. Among the definitions of online learning is the improvement of knowledge and skills through learning applications that are communicated, active, supported and managed using technology (Foxwell, 2021; Morrison, 2003). In addition, another definition of online learning is teaching and learning that uses information and communication technology to facilitate the processing of teaching and learning content (Ministry of Higher Education Malaysia, 2015). Online learning is different from face-to-face learning and there are two main differences which are the learning approach used and the method it is implemented (Choe et. al, 2019). Online learning can be done widely regardless of where students and educators are, with no limitations and no limited time required (Janelli, 2018). For example, teaching and learning is done online without the need for students and lecturers to meet face to face and teaching and learning can be done outside specific hours.

This study use model from Parasuraman (2000), The Technology Readiness Index (TRI). TRI is defined as an individual's willingness to adapt and use technology in daily activities and the learning process (Parasuraman & Colby, 2015). TRI also looks at the attitudes of individuals toward technology and focuses more on acceptance and use than technological efficiency (Pradhan et. al., 2018). TRI consist four constructs namely optimism, innovation, perception of discomfort, and perception of insecurity in measuring the acceptance and use of technology (Parasuraman, 2000). This study also Technology Acceptance Model (TAM) by Davis (1989). This model applies the relationship of beliefs, attitudes, intentions, and behavior to model user acceptance of technology. TAM is used to explain the use of technology, especially information systems, which states that the actual use of computer-based systems is determined by the user's attitude (Davis, 1989). In addition, ease of use will affect the ease of use where these two constructs mutually influence user behavior in using technology and lead to effectiveness in behavior (Davis, 1989).

The success or failure online learning method is based on the level of readiness and acceptance of the students towards this method. This is because the interaction between lecturers and students in the learning process happen based on available technology and non-face-to-face (Selvanathan et.al., 2020). This will certainly affect learning outcomes if planning is not done carefully and there is no participation from students to implement the teaching and learning process through online (Rodríguez Lera et al., 2021). Based on a study conducted by Pangayan et. al. (2021), a study conducted on 226 students at University Malaysia Sabah (UMS) found that online learning is beneficial to the development of their knowledge. In addition, online learning is also said to be effective as an aid in teaching and learning. This is because; online learning can help students to learn independently and is more flexible because various collaborative activities can be done during the teaching and learning process (Lee et. al., 2021).

This study is examining the relationship between the readiness and acceptance of technology with the effectiveness of online learning among undergraduates of Sultan Idris

Education University. Figure 1 depicts the research model as per the findings of this analysis.

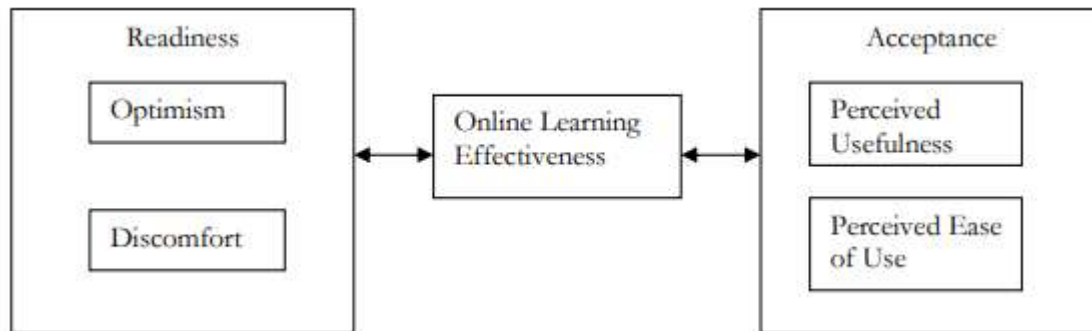


Figure 1. Research Model

RESEARCH METHOD

This study was carried out to examine the relationship between the readiness and acceptance of technology with the effectiveness of online learning during the COVID -19 pandemic. Accordingly, this study uses quantitative data analysis methods to identify and conduct an analysis of the relationship between elements that have a relationship with the effectiveness of online learning among undergraduate students at UPSI. The design of this study uses a survey method using a questionnaire.

The population in this study is undergraduate students at University Pendidikan Sultan Idris (UPSI). This population was chosen because the maturity level of undergraduates is more mature than primary and secondary school students. This is so because, in a study conducted by Lake and Boyd (2015), the maturity level of students is at the age of 20 to 23 years.

The location of this study was chosen because UPSI is a superior educational university in Malaysia where UPSI has been certified as the best educational university based on its achievements in receiving international recognition when it was crowned as occupying The World University Ranking by Subject Education in the 151st position in the world in 2023 (Malaysia Gazette, 2022). UPSI is also ranked 801st in the recent QS World University 2022/2023 and 182nd in QS Asia University. In addition, there is a system called MyGuru where this system is very beneficial to students in dealing with online learning.

Since this population is large, certain sampling techniques are used to collect data. In this study, the researcher chose non-random sampling which is Convenience Sampling. This is because time and resources are limited. This technique also allows researchers to obtain data quickly and easily because participants are easily available (Stratton, 2021).

The Pilot study was conducted on 30 undergraduate students at UPSI. The selection of 30 respondents to conduct a pilot study is sufficient to obtain normal data (Othman, 2015).

Result Descriptive Statistic

The researcher will use the mean score to answer the research question. The variable that will be analyzed is students' readiness to use technology which includes the perception of optimism and the perception of discomfort. These descriptive statistics consist of mean, standard deviation, and level which are obtained from Table 1 as follows:

Table 1 Descriptive Statistic Results

Variables	Mean	Std. Deviation
Level of student's acceptance to use of technology	3.94	.37
Level of perception usefulness	3.87	.64
Level of perception ease of use	4.04	.57

Level of the effectiveness of online learning	3.91	.67
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Multicollinearity Test

Next, the researcher used the Tolerance value and the Variance Inflation Factor (VIF) to detect the existence of multicollinearity in the study data. According to George and Mallery (2019), a tolerance value close to zero indicates that the study data has a multicollinearity problem. Pallant (2016) also stated that if the tolerance value is less than 0.10, it shows that the correlation between the variables is high and further contributes to the problem of multicollinearity. A VIF value that exceeds 10 indicates that the study data has a multicollinearity problem. Therefore, the tolerance value should exceed 0.10 and the VIF value should be less than 10 to avoid multicollinearity problems.

Table 2 shows that the tolerance value is above 0.10 and the VIF value is less than 10. Therefore, the study variables do not have multicollinearity problems.

Table 2: Multicollinearity Test

Variables	Collinearity Statistics	
	Tolerance	VIF
(constant)		
Optimism	.626	1.598
Discomfort	.739	1.353
Perceived Usefulness	.559	1.789
Perceived Ease of Use	.552	1.811

a. Dependent variable = Effectiveness of online learning

Correlation

From the Table 3 below it can be seen the positive value of the relationship between optimistic perception to the effectiveness of online learning which is 0.477. Next, the positive value of the relationship between the perception of discomfort and the effectiveness of online learning is 0.456. Meanwhile, the relationship between perceived usefulness and the effectiveness of online learning is positive which is 0.572. Lastly, the relationship between the perceived ease of use and the effectiveness of online learning is also positive which 0.590 is.

Table 3 Correlation Test Results

			Level	Online Effectiveness	Learning
Pearson correlation	Optimistic Perception	Coefficient	1.00	.477**	
		Sig. (2-way)	.	.00	
		N	357	357	
	Learning				
	Online Effectiveness	Coefficient	.477**	1.00	
		Sig. (2-way)	.00	.	
		N	357	357	
Pearson	Discomfort	Coefficient	1.00	.456**	

correlation	Perception	Sig. (2-way)	.00	
		N	357	357
	Learning	Coefficient	.456**	1.00
	Online Effectiveness	Sig. (2-way)	.00	.
		N	357	357
Pearson correlation	Perceived Usefulness	Coefficient	1.00	.572**
		Sig. (2-way)	.	.00
		N	357	357
	Learning	Coefficient	.572**	1.00
	Online Effectiveness	Sig. (2-way)	.00	.
		N	357	357
Pearson correlation	Ease of Use	Coefficient	1.00	.590**
	Perceived Use	Sig. (2-way)	.	.00
		N	357	357
	Learning	Coefficient	.590**	1.00
	Online Effectiveness	Sig. (2-way)	.00	.
		N	357	357

**Correlation is significant at the 0.01 level (2 decimal points)

Coefficient of Determination (R2)

Table 4 below shows that perception of optimism, the perception of discomfort, perceived of usefulness and perceived ease of use contributes to the effectiveness of online learning. Therefore, the optimistic perception, the perception of discomfort, the perception of usefulness and the perception of ease of use are factors that affect the effectiveness of online learning among undergraduate students at UPSI.

Table 4 Model Summary

Model	R	R2	R2 Adjusted	Std. An Error of the Estimate
1	.681a	.464	.458	.49761
2	.674b	.455	.450	.50115
3	.656c	.431	.427	.51133
4	.590d	.348	.346	.54638

Predictors: (Constant), Optimistic Perception, Discomfort Perception, Perceived Usefulness, Perceived Ease of Use

Dependent Variables: Online Learning Effectiveness

ANOVA

Table 5 shows that ANOVA results in regression analysis. Based on Regression Model 4, the independent variable is the perception of optimism, perception of discomfort, perception of usefulness and perception of ease of use are factors that significantly affect the effectiveness of online learning [F (4, 352) = 76.139, P < .05]. The ANOVA test results also show that all four multiple regression models resulting from the independent variable and the dependent variable are significant.

Table 5 ANOVA

Model	Unstandardized Coefficient	Standardized Coefficients	t	Sig.
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		ts				
		B	Std. Error	Beta		
1	(Constant)	1.132	.204		5.541	.000
	PM	.688	.050	.590	13.768	.000
2	(Constant)	.655	.202		3.239	.001
	PM	.457	.057	.392	8.043	.000
	PKG	.365	.051	.349	7.166	.000
3	(Constant)	.101	.243		.416	.678
	PM	.366	.060	.314	6.081	.000
	PKG	.342	.050	.328	6.817	.000
	PKT	.249	.063	.180	3.941	.000
4	(Constant)	-.329	.298		-1.102	.271
	PM	.334	.061	.286	5.452	.000
	PKG	.288	.055	.276	5.281	.000
	PKT	.242	.063	.175	3.845	.000
	PO	.182	.074	.121	2.457	.015

a. Dependent Variable = Effectiveness of online learning

b. PM = Ease of Use Perception, PKG = Usefulness Perception, PKT = Discomfort Perception, PO = Optimistic Perception

Overall, the results of data analysis show that the perception of ease of use ($\beta = .286$, $p < .05$), perception of usefulness ($\beta = .276$, $p < .05$), perception of discomfort ($\beta = .175$, $p < .05$) and optimistic perception ($\beta = .121$, $p < .05$) is a factor that affects the effectiveness of online learning significantly among students. Therefore, the alternative hypothesis that was tested was supported and reported that the four variables accounted for 46.4 percent ($r = .681$) of the change in variance in the effectiveness of online learning [$F(4, 352) = 76.139$, $p < .05$] and form a multiple regression equation as follows:

$$Y = -0.329 (\text{Constant}) + 0.334 (\text{PM}) + 0.288 (\text{PKG}) + 0.242 (\text{PKT}) + 0.182 (\text{PO})$$

Guidance:

Y = Effectiveness of online learning

Constant = -329

PM = Perceived Ease of Use

PKG = Perceived Usefulness

PKT = Discomfort Perception

PO = Optimistic Perception

DISCUSSION

Importance to the Education Sector and Ministry of Higher Education Malaysia (KPTM)

The main method in expanding access to education and improving the quality of teaching and learning while making learning adaptable to the needs of students is to use one of the latest teaching methods, which is online learning (KPTM, 2015). With this study, it can benefit KPTM as the responsible party in planning education programs so that elements that can be improved can be identified and improved in the curriculum. This study can also benefit the ninth leap which is global-level online learning in the Malaysian Education Development Plan (PPM PT) 2015 2025 by following per under the principle that ICT-supported learning has a very wide transformation, an integrated learning model integrates the best ICT-supported learning and online learning as the main catalyst for another surge (Ministry of Higher Education, 2015).

Importance to Policymakers e - National Learning (DePAN)

With this study, the National e-Learning policymakers can improve and upgrade the e-learning policy to the latest and in line with the changes in information and communication technology that occur in the era of the COVID-19 pandemic.

Importance to University Management and Administration

This study also aims to help university management and administrators to improve the existing system to a better one so that students are more motivated to continue learning online at home during the COVID-19 pandemic. Through this study, the administrators and management of the university can use the results of the study to make improvements to the issue of the effectiveness of online learning in addition to being able to find out the level of readiness of students in using online learning methods. If this matter can be improved well, it can have a positive impact on the university, such as increased productivity, reduced student absenteeism during online learning and students will be more motivated to follow online learning (Abd Razak & Mohd Rusli, 2022).

Importance to Students

This study is also seen to give importance to students to be more prepared to face changes in the world of education. This is so because, Adlina, Mohamed Khairi, and Mohd Asri (2020) stated that technology in education is developing and advancing rapidly with the flow of time, therefore students need to be prepared to face the following changes, especially in teaching and learning.

In addition, this study can also be used as a reference for students to practice online learning methods in their learning so that students' technology skills can be improved and increase students' knowledge of the latest technology. Furthermore, the use of technology in learning can also have a positive impact on the relationship between teachers and students. This is because interesting content, pedagogy, and teaching design can improve the learning process and quality in addition to having a good impact on the education system according to the latest technological era.

CONCLUSION

Based on this study, it can be concluded that the variable factors of optimistic perception, perception of discomfort, perception of usefulness, and perception of ease of use affect the effectiveness of online learning. Therefore, it is appropriate for e-learning policymakers to consider the factors of optimistic perception, discomfort perception, usability perception, and easy-to-use perception in the planning and implementation of e-learning policy in the education sector.

In addition, the Malaysian Ministry of Higher Education (KPTM), especially those related to programs and training, need to act to provide programs and training for students to improve their skills and knowledge regarding the use of technology in addition to providing sufficient infrastructure for students to undergo online learning methods. This is to ensure that students do not fall behind in technological progress and are ready to face changes in learning methods, in addition to all students moving in line with the current of information technology development and making this method a practice.

Finally, it is hoped that this study can contribute meaningful knowledge to all readers and parties involved. Suggestions for further research have also been discussed so that future researchers can further develop this knowledge. In conclusion, this study can also be used as a reference source and source of information for those who will expand their knowledge in this field in the future.

REFERENCES

- Abd Razak, R. H., & Mohd Rusli, N. F. (2022). Pembelajaran Secara dalam Talian: Tahap Kesediaan dan Keberkesanan Pelaksanaannya kepada Pelajar. *LSP International Journal*, 9(1), 31–43.

- Abdul Ghani, M. T., Wan Daud, W. A. A., & Jaffar, M. N. (2019). Penerimaan Pelajar Kursus Bahasa Arab di Universiti Malaya Kelantan Terhadap Pembelajaran Teradun Berteraskan Model Penerimaan Teknologi (TAM). *Asian People Journal*, 2(1), 84–94.
- Adlina, A. K., Mohamad Khairi, H. O., & Mohd Kasri, S. (2020). Memacu Pendidikan di Era Revolusi Industri 4.0: Penerapan Nilai-nilai Islam dan Inovasi dalam Pengajaran di Institusi Pengajian Tinggi Driving Education in the Era of the Industrial Revolution 4.0: Implementation Islamic Values and Innovation in Teaching. *Islāmiyyāt*, 42(khas), 13–20. <https://doi.org/10.17576/islamiyyat-2020-42IK-02>
- Choe, R. C., Scuric, Z., Eshkol, E., Cruser, S., Arndt, a., Cox, R., Toma, S. P., Shapiro, C., Levis-Fitzgerald, M., Barnes, G., & Crosbie, R. H. (2019). Student satisfaction and learning outcomes in asynchronous online lecture videos. *CBE-Life Sciences Education*, 18, 1-14.
- Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 319 – 340.
- Dennon, A. (2020). Coronavirus and the digital divide: Best colleges. Diperoleh daripada <https://www.bestcolleges.com/blog/coronavirus-deepens-the-digital-divide/>
- Foxwell, W. (2021). Online Learning Readiness and Academic Performance. Doctoral Dissertation (Delaware), 105–112.
- George, D., & Mallery, P. (2019). *IBM SPSS Statistics 25 Step by Step: A Simple Guide and Reference (15th Edition)*. New York: Taylor & Francis Group
- Harahap, F. R. (2019). Pengaruh Penerapan Model PBL (Problem Based Learning) Untuk Meningkatkan Kemampuan Berfikir Kritis Siswa Pada Materi Sifat Koligatif Larutan. Doctoral Dissertation: UNIMED.
- Janelli, M. (2018). E-learning in theory, practice, and research. *Voprosy Obrazovaniya / Educational Studies Moscow*, 2018(4), 81–98.
- Kementerian Pendidikan Tinggi. (2015). *Dasar e-Pembelajaran Negara 2.0. Dasar E-Pembelajaran Negara 2.0*, 53.
- Lake, W., & Boyd, W. (2015). Age, Maturity and Gender, and the Propensity towards Surface and Deep Learning Approaches amongst University Students. *Creative Education*, 06(22), 2361–2371. <https://doi.org/10.4236/ce.2015.622242>
- Lee, L., Pangayan, V., & Chia, Y. E. (2021). Effective Social Media Features As Strategy Platform Teaching Effective Social Media Features As Strategy Platform Teaching and Learning During The Movement Control Order (MCO) Period. *Turkish Journal of Phusiotherapy and Rehabilitation*, 32(3), 7193-7194
- Pangayan, V. B., Foo, J., Michael, J. F., & Atang, C. (2021). Keberkesanan Kaedah Pembelajaran Dalam Talian Ke Atas Kursus Terpilih Bagi Komponen Kesenian Dan Kebudayaan Pusat Kokurikulum Dan Pemajuan Pelajar, Universiti Malaysia Sabah
- Parasuraman, A. 2000. Technology Readiness Index (TRI): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies. *Journal of Service Research* (2): 307–320.
- Rodríguez Lera, F. J., González, D. F., Rico, F. M., Guerrero-Higueras, Á. M., & Conde, M. Á. (2021). Measuring students acceptance and usability of a cloud virtual desktop solution for a programming course. *Applied Sciences (Switzerland)*, 11(15). <https://doi.org/10.3390/app11157157>
- Selvanathan, M., Hussin, N. A. M., & Azazi, N. A. N. (2020). Students learning experiences during COVID-Work from home period in Malaysian Higher Learning Institutions. *Teaching Public Administration*. <https://doi.org/10.1177/0144739420977900>

- Staddon, R. V. (2020). Bringing technology to the mature classroom: age differences in use and attitudes. *International Journal of Educational Technology in Higher Education*, 17(1). <https://doi.org/10.1186/s41239-020-00184-4>
- Subramaniam, R., & Mohd Hamzah, M. I. (2020). Amalan kepimpinan teknologi guru besar serta cabaran dan cadangan penambahbaikan di sekolah. *Prosiding Seminar Nasional FIP 2020*, 1(1), 281–294.
- Zakaria, S., Subramaniam, Muthiah, M., Abdul Malek, Y., Fong, C. S., & Kandasamy, O. (2020). Kesiediaan Penggunaan Google Meet Sebagai Platform Pengajaran Dan Pembelajaran Dalam Talian Bagi Siswa Guru Di Institut Pendidikan Guru Kampus Sultan Abdul Halim. *Proceedings of International Conference of The Future Education IConFEEd 2020*, November, 84–102.
- Zulkifli, N., Hamzah, M. I., & Abdul Razak, K. (2020). Isu dan cabaran penggunaan MOOC dalam proses pengajaran dan pembelajaran. *Journal of Research, Policy & Practice of Teachers & Teacher Education*, 10(1), 78– 95.