Mediating Effect of Digital Readiness on the Relationship between Online Peer Collaboration, Psychological Motivation and Online Engagement in Malaysian Online Distance Learning Higher Institutions

Zahir Osman[1]* ● Liana Mohamad[2] ● Ratna Khuzaimah Mohamad[3]

[1, 2, 3] Faculty of Business and Management, Open University Malaysia, Kelana Jaya, Malaysia.

Corresponding author. Email: zahir_osman@oum.edu.my

Abstract

This study consolidates online peer collaboration, psychological motivation, digital readiness, and online engagement to examine the influence of digital readiness as a mediator in the relationship between online peer collaboration and psychological motivation and online engagement among online distance learning students in Malaysian higher education institutions. For research hypotheses testing, an online survey involving students from different online distance learning higher education institutions in Malaysia was administered, yielding 307 clean data that was used in data analysis. This study adopted the Structural Equation Modeling for data analysis. The statistical software SPSS ver. 23 and SmartPls ver. 3.0 were used. Results revealed that online peer collaboration and digital readiness have a positive and significant direct relationship with online engagement. Digital readiness was a significant mediator in the relationship between online peer collaboration and psychological motivation and online engagement of online distance learning students in Malaysian higher education institutions. This study also revealed the important role of digital readiness in ensuring the effectiveness of online engagement in the online distance learning environment. This study has made a significant contribution to online distance learning higher institutions, lecturers, and students in examining the effectiveness of engagement among online students.

Keywords: digital readiness, indirect effect, online distance learning, online engagement, online peer collaboration, psychological motivation

1. Introduction

Historically, student engagement has focused primarily on improving academic performance, positive behaviour, and student attributes so that they will continue studying. Because of its focus on solutions for higher education institutions, research on student involvement often involve students who are typically concerned with dismissal (Willms, Friesen, & Milton, 2009), and student involvement as a way to regain engagement. Student engagement strategies have been implemented as a method to control behaviour in the classroom. Recently, student participation has been built around the goal that expects all students to learn. Currently, student engagement is built on the expected goal of improving learning methods and the ability of all students to learn (Gilbert, 2007). Student participation has become a strategic learning process that results in self-responsibility. The current literature on engagement is extremely diverse and

ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

spans a wide range of disciplines and theories (Boekaerts, 2016; Eccles, 2016). This situation has led to some scholars of the multidimensional commitment model theory (Fredricks, 2011; Fredricks et al., 2004; Fredricks et al., 2016) to consider engagement as a multifaceted concept that can include behavioural, emotional, and cognitive aspects (Fredricks & McColskey, 2012; Sinatra et al., 2015). According to Fredricks et al. (2004), behavioural engagement emphasises participation, sustainability, and involvement in academic activities. Emotional involvement focuses on positive and negative reactions to peers, teachers, and colleges, as well as the value and assessment of learning outcomes. Overtime, student engagement strategies will continue to evolve.

Cognitive involvement refers to the students' investment in their effort to understand and comprehend. By taking into consideration these perspectives, this study examines online peer collaboration and psychological motivation, digital readiness, and online engagement among Open and Distance Learning (ODL) students in Malaysian higher education institutions. Specifically, this study assesses the mediating effect of digital readiness on the relationship between online peer collaboration and psychological motivation and online engagement among ODL students.

2.   Literature Review

Collaborative learning is defined as an approach that transcends the limits of normal interaction. Collaboration brings students to a shared experience with the goal of building knowledge. Everett and Drapeau (2001) define collaborative learning as working together using different knowledge and experience to acquire quality through a conflict of different perspectives, and through the building and unification of student communities. Collaborative learning brings together ideas for discussion and focuses on interactions that evolve through differences in participants' knowledge, skills, and positions. These differences motivate students as they take on different roles and responsibilities. The use of online learning tools makes it possible to attain higher-level learning via collaboration with peers and other experts in their respective fields (Junco et al., 2011; Meyer, 2010; Novak et al., 2012; Redecker et al., 2010). Academic self-efficacy and optimism have been noted to be significantly related to performance and adjustment. As a result, both directly influence students' academic performance (Chemers et al., 2001). Data from 723 Malaysian participants verified that both male and female students were satisfied with online learning for collaborative learning and engagement, in which it was found to positively influence learning performance (Al-Rahmi et al., 2018). Online learning has been considered a strong driver for learning activities in terms of frankness, interactivity, and friendliness. According to Ansari and Khan (2020) in their study involving 360 university students in eastern India, online peer collaboration has a positive and significant impact on student online engagement.

Many types of research have utilised motivation studies in an online environment (Artino, 2008; Bures et al., 2002), as well as the theory of intrinsic–extrinsic motivation (Martens et al., 2004; Xie et al., 2006). Ryan and Deci (2000) introduced the Self-Determination Theory, which is an influential theory that clarifies intrinsic–extrinsic motivation in greater intensity and constructs the basic premise of student autonomy. Student autonomy not only involves self-determination or autonomy (i.e., feeling a sense of freedom and control), but also capability (i.e., feeling empowered) and connection to all human beings. The Self-Determination Theory claims to have (like feeling included and connected with others), related to their environment. When environmental conditions support a person's autonomy, a more autonomous form of motivation (i.e., higher quality) is promoted (Ryan & Deci, 2000). When significantly motivated, external incentives are not required and may even be ineffective (Brophy, 2010), because the performance becomes the reward. Students are isolated to perform an activity for reasons that are separate from the activity itself (Ryan & Deci, 2000); for example, earning high scores, avoiding negative consequences, or fulfilling valuable missions (such as passing a course to earn a degree). In addition, such activities can be considered suitable for future careers. The process of external motivation is explained by external rules on the grounds of performing tasks outside the individual. However, the extent to which activities are considered to be operated externally can vary, and therefore have different types of external engines (Hartnett et al., 2011). According to Brophy (2010), motivation is a "theoretical construct to describe the

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

behaviour, particularly the initiation, direction, intensity, persistence, and quality perspective". Motivation can affect what we learn, how we learn, and when we choose to learn (Schunk, 1995). Many studies have demonstrated that motivated students tend to be more active in adjusting to difficulties, improving performance, engaging in well-deserved activities, and are also more resilient (Schunk et al., 2008; Zahir et al., 2021). Modern perspectives on motivation in relation to individual cognitive and emotional processes such as thoughts, beliefs, and goals emphasise the relationship between students and their learning environment (Brophy, 2010). Current studies in online environments are inclined to take on a limited outlook of motivation that does not recognise the intricacy and vibrant interaction of factors of fundamental and encouraging motivation to gain knowledge. Instead, current studies in online environments are focused on motivating learning environments. (Chan Lin, 2009). One study examined successful online learners' traits, in which motivation was deemed a personal characteristic that remains relatively constant across contexts and circumstances (Wighting et al., 2008). Such studies signified that intrinsic motivation is a crucial element of successful learners (Shroff et al., 2008).

According to Hong and Kim (2018), digital readiness for ODL higher education students signified their knowledge, skills, attitudes, and competencies in operating digital technologies and equipment to achieve their educational goals and anticipation in their study. Students' digital technology adoption has the tendency to strengthen online engagement in ODL, in which students are naturally better able to deal with technology because they are already used to a technologically rich environment (Jones, 2012). Kim et al. (2018) suggested that students in South Korean universities who are familiar with digital technology may also sometimes be unable to cope with digital technology in their online academic engagement, and this will affect their academic literacy. Presently, there is a large gap between digital skills in informal contexts and informal learning among many ODL students in higher education institutions (Margaryan et al., 2011). Digital readiness for ODL students includes the significant use of digital skills for academic study, the digital medium ability through active engagement and ability to engage digital culture, and the ability to apply information skills and strategies in academic work. Digital readiness can be one of the important relationships between the student's online learning experience and academic performance (Zahir et al., 2018). In short, digital readiness in online learning focuses on students' preparedness to successfully cope in an online education context (Blayone, 2018). Previous studies have confirmed that students' digital readiness has a positive influence on their performance in online learning (Bernard et al., 2004) and raises the interaction in online learning settings (Demir & Horzum, 2013). Consequently, online learning and application of digital media have been incorporated into universities' research aims and academic programmes. Students' digital readiness in online learning was explained by Warner et al. (1988), who separated it into three aspects, i.e., students' inclination for a delivery form students' self-belief in using an electronic communication environment in their learning and students' capability to take on self-directed learning. Borotis and Poulymenakou (2004) described student digital readiness as being mentally and physically ready for online learning education. Current descriptions focus on abilities, attitudes, learning contexts, and outcomes for flourishing learning among students and lecturers (Engin, 2017). Previously, student digital readiness for online learning has been studied through various dimensions and utilising different measuring instruments (Martin et al., 2020). This variety demonstrates that readiness for online learning is a multidimensional construct, but there is a lack of consensus with regard to its components (Warner et al., 1988). Online learning students' attitudes (Farid, 2014), time management (Martin et al., 2020), communication (Farid, 2014; Martin et al., 2020), and technical competencies (Al-Araibi et al., 2016) appear to be pertinent and important dimensions of readiness.
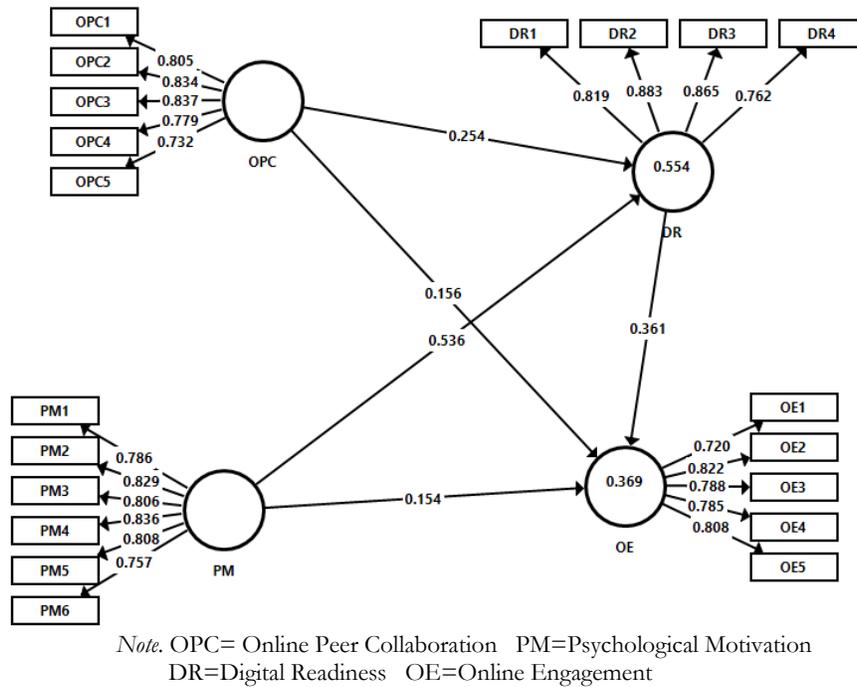
ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

Note. OPC= Online Peer Collaboration   PM=Psychological Motivation
DR=Digital Readiness   OE=Online Engagement

Figure 1. Research Model

The following research objectives were developed for this study:

i. To examine if there is a relationship between psychological motivation and online peer collaboration and digital readiness among ODL higher education institution students in Malaysia.
ii. To examine if there is a relationship between psychological motivation and online peer collaboration and online engagement among ODL higher education institution students in Malaysia.
iii. To determine if there is a relationship between digital readiness and online engagement among ODL higher education institution students in Malaysia.
iv. To examine if there is a mediating effect of digital readiness on the relationship of and between psychological motivation and online engagement among ODL higher education institution students in Malaysia.
v. To examine if there is a mediating effect of digital readiness on the relationship of and between online peer collaboration and online engagement among ODL higher education institution students in Malaysia.

Based on the above, the following hypotheses were proposed for this study:

H_1: There is a positive and significant relationship between digital readiness and online engagement among ODL higher education institution students in Malaysia.
H_2: There is a positive and significant relationship between online peer collaboration and digital readiness among ODL higher education institution students in Malaysia.
H_3: There is a positive and significant relationship between online peer collaboration and online engagement among ODL higher education institution students in Malaysia.
H_4: There is a positive and significant relationship between psychological motivation and digital readiness among ODL higher education institution students in Malaysia.
H_5: There is a positive and significant relationship between psychological motivation and online engagement among ODL higher education institution students in Malaysia.
H_6: There is a mediating effect of digital readiness on the relationship of and between psychological motivation and online engagement among ODL higher education institution students in Malaysia.

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

H_7: There is a mediating effect of digital readiness on the relationship of and between online peer collaboration and online engagement among ODL higher education institution students in Malaysia.

3.   Research Method

3.1.   Approach, Design and Software

This study research model included online peer collaboration, psychological motivation, digital readiness, and online engagement. The measures for online peer collaboration (independent variable) were adopted from Lee et al. (2019), psychological motivation (independent variable) from Jeongju, Hae and Ah Jeong (2019), digital readiness (mediator) from Hong and Kim (2018), and online engagement (dependent variable) from Dixson (2015), respectively. All three variables measurement items were based on the Malaysian ODL context. This study took up a quantitative research approach utilising primary data. All 20 measurements representing their own constructs were assessed by applying Likert scales ranging from "strongly disagree" to "strongly agree". This was to allow for most of the response rate and quality, while minimising the "frustration level" of the respondents (Babakus & Boller, 1992; Sachdev & Verma, 2004). Before the analysis, the data were screened with SPSS 18. The partial least squares-structural equation modeling (PLS-SEM) was considered a key approach (Hair et al., 2017) for data evaluation. SmartPLS 3 software (Ringle et al., 2015) was utilised for data analysis.

3.2.   Sample

This study focused on ODL students in Malaysia. ODL students included students studying at diploma, degree, master's, and doctorate levels. Data were collected from randomly selected students at three ODL higher institutions in Malaysia. The online questionnaires were e-mailed to 425 students at three ODL institutions in Malaysia. A total of 321 students (response rate=75.52%) responded to the survey. Because this study utilised a variance-based approach for data analysis, and after considering that no standard exists for the minimum acceptable response rate in conducting the online survey (Hamilton, 2003), the collected sample was considered sufficient for analysis. Subsequently, the data screening technique recommended by Field (2013) was applied. This was followed by the application of SPSS 18 to re-evaluate the presence of outliers in the data. With this method, 14 outliers were detected and removed before the main analysis was performed. Therefore, the PLS-SEM algorithm was carried out on a sample of 307 respondents.

4.   Findings

4.1.   Common Method Bias

Kock (2015), and Kock and Lynn (2012) recommended the total collinearity check as a comprehensive method for the parallel evaluation of vertical and sideways collinearity. Variance inflation factors (VIFs) higher than 3.3 point to pathological collinearity, and indicate the issue of common method bias of the model. For this reason, if the total collinearity check VIFs are lower than 3.3, then it can be assumed that the model causes no issue of common method bias. Table 1 illustrates the total collinearity check VIFs, which were found to be lower than 3.3. As a result, common method bias was not considered a problem.

Table 1. Collinearity Statistics VIFs

	OE	OPC	DR	PM
OE		1.458	1.365	1.491
OPC	2.476		2.465	1.845
DR	2.351	2.501		2.017
PM	3.122	2.276	2.453	

ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

4.2. Reflective Measurement Model Evaluation

Hair et al. (2017) recommends assessing each measurement in the first order, and adopt second-order measurement models. By carrying out these steps, two items with low loading were identified and removed from the framework. After removing these measurement items, all the statistical requirements to substantiate the reliability and validity of the model proposed were met. In the meantime, the item factor loadings are illustrated in Figure 1. Table 2 summarises the scores for Cronbach's alpha, composite reliability, together with the convergent validity evaluation of the proposed model. These evaluations established that there was no problem in verifying internal consistency.

Moreover, all the Average Variance Extracted (AVE) figures were higher than 0.5, confirming the presence of convergent validity (Hair et al., 2017) for each variable in the framework. Discriminant validity was also calculated by computing Heterotrait-Monotrait (HTMT) ratio analysis, which is a proposed criterion for assessing discriminant validity in Variance-Based Structural Equation Modeling (VB-SEM; (Henseler et al., 2015). Table 3 shows the HTMT ratios of the variables pertaining to the original sample, and 95% confidence intervals (two-tailed) have been presented, suggesting the confirmation of discriminant validity on HTMT 0.85 and the upper level of the Bias-Corrected and Accelerated bootstrap confidence intervals were less than 1.

Table 2. Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
DR	0.853(0.814, 0.822)	0.861(0.822, 0.888)	0.901(0.878, 0.919)	0.695(0.644, 0.739)
OE	0.845(0.808, 0.876)	0.855(0.816, 0.882)	0.889(0.866, 0.909)	0.617(0.564, 0.667)
OPC	0.857(0.818, 0.888)	0.858(0.818, 0.887)	0.898(0.874, 0.918)	0.638(0.581, 0.693)
PM	0.890(0.859, 0.915)	0.891(0.858, 0.914)	0.916(0.895, 0.934)	0.647(0.587, 0.702)

Note. Confidence interval computed based on percentile bootstrapping test with 10,000 sub-samples and at 5% confidence level. Two-tail test.

Table 3. Heterotrait-Monotrait (HTMT) Ratio

	DR	OE	OPC
DR			
OE	0.663(0.566, 0.749)		
OPC	0.759(0.669, 0.832)	0.590(0.475, 0.685)	
PM	0.827(0.748, 0.885)	0.603(0.487, 0.708)	0.851(0.774, 0.903)

Note. A two-tail percentile bootstrap test at 5% confidence interval (2.5%, 97.5%) with 10,000 sub-samples were performed.

4.3. Structural Model

The directing principle of Hair et al. (2017) was adopted to gauge the structural model in this study and to ascertain the significance of path coefficients. Table 4 demonstrates the outcome of hypotheses testing. H_1 proposed there is a positive relationship between digital readiness and online engagement, and the statistical result confirmed that there is a positive and significant influence of digital readiness on online engagement (ß = 0.361, t = 5.041, p=0.000); therefore, H_1 was supported. The statistical result of H_2 also showed there is a significant and positive relationship between online peer collaboration and digital readiness (ß = 0.254, t = 3.840, p = 0.000), hence supporting H_2. Similarly, the statistical result of H_3 also confirmed that online peer collaboration has a positive and significant influence on online engagement (ß = 0.156, t = 2.106, p=0.035); therefore, H_3 was supported as well. H_4 results also confirmed that there is a positive and significant relationship between psychological motivation and digital readiness (ß = 0.536, t = 8.673, p=0.000); hence H_4 was supported. However, the statistical result of H_5 showed a positive but

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

not significant relationship between psychological motivation and online engagement (ß = 0.154, t = 1.742, p=0.082); hence H_5 was not supported. In the analysis involving mediating effect relationship, H_6 results showed that digital readiness mediated the relationship between psychological motivation and online engagement (total indirect effect=0.194, t=4.098, p=0.000, LLCI=0.111, ULCI=0.295) and therefore, H_6 is supported. Lastly, H_7 results confirmed that digital readiness mediated the relationship between online peer collaboration and online engagement (total indirect effect=0.092, t=3.191, p=0.001, LLCI=0.046, ULCI=0.161) and therefore, H_7 is supported.

Table 4. Hypotheses Testing Results

	Beta	T Statistics	P Values	LLCI 2.50%	ULCI 97.50%	Decision
H_1:DR -> OE	0.361	5.041	0.0000	0.216	0.496	*Supported*
H_2:OPC -> DR	0.254	3.84	0.0000	0.123	0.383	*Supported*
H_3:OPC -> OE	0.156	2.106	0.0350	0.009	0.301	*Supported*
H_4:PM -> DR	0.536	8.673	0.0000	0.408	0.651	*Supported*
H_5:PM -> OE	0.154	1.742	0.0820	-0.023	0.321	*Not Supported*
H_6:PM -> DR -> OE	0.194	4.098	0.0000	0.111	0.295	*Supported*
H_7:OPC -> DR -> OE	0.092	3.191	0.0010	0.046	0.161	*Supported*

5.   Discussion

Based on the results of the statistical analysis, online engagement is clearly very important in ensuring that the learning process among ODL students is more effective. In determining effective online engagement, several factors can play an effective role. As suggested in the model above, online peer collaboration and psychological motivation are two factors that contribute to effective online engagement. ODL institutions need to ensure that in their learning process, students are involved in online peer collaboration. This can be achieved by making the e-learning platform more interesting and interactive for students to use more often, especially in holding discussions on their assignments. The results of the statistical analysis above clearly show that online peer collaboration positively and significantly affects online engagement (ß = 0.156, t = 2.106, p=0.035). This result was consistent with the findings of Kim et al. (2018) and Al-Rahmi et al. (2018). Therefore, universities need to invest in the latest technology for use in developing e-learning platforms to attract and engage students. Similarly, lecturers want to more actively interact in the e-learning platform, and encourage students to also interact with each other to improve understanding of the subjects they are enrolled in. However, if digital readiness is placed as a mediator in the indirect relationship between online peer collaboration and online engagement, the influence of online peer collaboration on online engagement will be more effective (total indirect effect=0.092, t=3.191, p=0.001, LLCI=0.046, ULCI=0.161). This is supported by the findings in the study conducted by Demir and Horzum (2013) and Martin et al. (2020). Digital readiness plays an important role in ensuring that online peer collaboration can effectively influence online engagement. Therefore, it is very important to ensure that digital readiness is further strengthened.

The statistical analysis results show that psychological motivation has no significant direct relationship with online engagement. On the other hand, psychological motivation has a relationship with and indirect influence on online engagement through digital readiness as a mediator. Therefore, it is not enough to increase the psychological motivation of ODL students, but their digital readiness should also be enhanced. Students' skills in using the latest technology in their learning can improve the effect of motivation on online engagement. From the data analysis, it is clear that digital readiness mediated the relationship between psychological motivation and online engagement (total indirect effect = 0.194, t = 4.098, p = 0.000, LLCI = 0.111, ULCI = 0.295). This result is in line with findings from the study conducted by Hartnett et al. (2011) and Shroff et al. (2008). Lecturers need to play a role in motivating and encouraging students to improve the use of e-learning platforms in the learning process. Students

ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

who enrol in online study may think they only need to attend online classes without being active on the e-learning platform after class. Therefore, efforts to motivate students must be made so they are more inclined to engage online through an effective e-learning platform. The results of the statistical analysis above clearly show that psychological motivation positively and significantly affects online engagement (ß = 0.154). These results are consistent with the findings found by Wighting et al. (2008). Universities must thus come up with strategies to increase the motivation of ODL students to engage in an online setting.

ODL higher education institutions need to adopt an approach through which online peer collaboration and psychological motivation can be strengthened, and correspondingly improve the students' digital readiness by ensuring they can acquire new knowledge and skills in technology. This will allow the students to be better prepared to participate and engage in online learning. Online tutors must have frequent communication with students to encourage better online participation and engagement. They must also be able to guide students to familiarise themselves with online technology so that they will feel more comfortable in online learning. Students must also be encouraged to assist and motivate their peers to participate in online engagement. This collaboration is very important to ensure group learning can take place in online study. For future studies, it is recommended that other variables such as time management, communication, and tutor performance are considered as factors in developing a research model to study online engagement in ODL.

6.   Conclusion

This study focused on the direct effects of online peer collaboration, psychological motivation, digital readiness, and online engagement among students in Malaysian ODL higher education institutions. The statistical results show that digital readiness is a significant mediator in the relationships of online peer collaboration and psychological motivation with online engagement among ODL students. Based on the findings, ODL institutions must give greater attention to strategies that can strengthen online peer collaboration and psychological motivation, while at the same time also emphasise improving digital readiness among ODL students. By doing so, online engagement among ODL students can be elevated and further improved to make their studies more effective, which would ultimately improve their performance in the subjects they are enrolled in. Online distance learning higher education institutions need to take the approach where online peer collaboration and psychological motivation can be strengthened and simultaneously strengthens the students' digital readiness by ensuring the students acquire new knowledge and skills in technology. This will allow the students to be better prepared to participate and engage in their online learning.

References

Al-Araibi, A.A.M.; Mahrin, M.; Mohd, R.C. (2016). A systematic literature review of technological factors for e-learning readiness in higher education. *Journal of Theory Applied Information Technology*, *93*, 500–521.

Al-Rahmi, W. M., Alias, N., Othman, M. S., Marin, V. I., & Tur, G. (2018). A model of factors affecting learning performance through the use of social media in Malaysian higher education. *Computers & Education, 121*, 59–72.

Ansari, J. A. N., & Khan, N.A. (2020) Exploring the role of social media in collaborative learning the new domain of learning. *Smart Learning Environment, 7*(9). https://doi.org/10.1186/s40561-020-00118-7

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

Artino, A. R. (2008). Motivational beliefs and perceptions of instructional quality: Predicting satisfaction with online training. *Journal of Computer Assisted Learning, 24*(3), 260–270. https://doi:10.1111/j.1365-2729.2007.00258.x

Babakus, E., & Boller, G. W. (1992), An empirical assessment of the SERVQUAL scale. *Journal of Business Research, 24*, 253-68.

Bernard, R. M., Brauer, A., Abrami, P. C., & Surkes, M. (2004). The development of a questionnaire for predicting online learning achievement. *Distance Education., 25*, 31–47.

Blayone, T. (2018). Reexamining digital-learning readiness in higher education: Positioning digital competencies as key factors and a profile application as a readiness tool. int. *J. E-Learn. Corp. Gov. Healthc. High. Educ., 17,* 425–451.

Boekaerts, M. (2016). Engagement as an inherent aspect of the learning process. *Learning and Instruction, 43*, 65–83. https://doi:10.1016/j.learninstruc.2016.02.001

Borotis, S., & Poulymenakou, A. (2004). E-learning readiness components: Key issues to consider before adopting e-learning interventions. In J. Nall, & R. Robson (Eds.), *Proceedings of E-Learn 2004--World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education* (pp. 1622-1629). Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/primary/p/11555/

Brophy, J. (2010). *Motivating students to learn* (3rd ed.). Routledge.

Bures, E. M., Amundsen, C. C., & Abrami, P. C. (2002). Motivation to learn via computer conferencing: how task-specific motivation and CC expectations are related to student acceptance of learning via CC. *Journal of Educational Computing Research, 27*(3), 249. https://doi: 10.2190/R4WG-88TJ-C3VF-YQJ0

Chan Lin, L. -J. (2009). Applying motivational analysis in a web-based course. *Innovations in Education & Teaching International, 46*(1), 91–103. https://doi: 10.1080/14703290802646123

Chemers, M. M., Hu, L. T., & Garcia, B. F. (2001). Academic self-efficacy and first-year college student performance and adjustment. *Journal of Educational Psychology, 93*(1), 55–64. https://doi.org/10.1037/0022-0663.93.1.55.

Demir Kaymak, Z., & Horzum, M. B. (2013). Relationship between online learning readiness and structure and interaction of online learning students. *Educational Sciences: Theory & Practice, 13*, 1792–1797. https://files.eric.ed.gov/fulltext/EJ1017736.pdf

Dixson, M. D. (2015). Measuring student engagement in the online course: The Online Student Engagement Scale (OSE), *Online Learning, 19*(4), pp. 1-15. https://files.eric.ed.gov/fulltext/EJ1079585.pdf

Eccles, J. (2016). Engagement: Where to next? *Learning and Instruction, 43*, 71–75. https://doi:10.1016/j.learninstruc.2016.02.003

Engin, M. (2017). Analysis of students' online learning readiness based on their emotional intelligence level. *Universal Journal of Educational Research, 5*(12A), 32–40. https://files.eric.ed.gov/fulltext/EJ1165504.pdf

Everett, D. R., & Drapeau, R. A. (2001, February). *Students' views of collaborative learning in the distance learning environment.* [Paper presentation]. Organizational Systems Research Association Conference, OH, Cleveland.

Farid, A. (2014). Student online readiness assessment tools: A systematic review approach. *Electronic Journal of E-Learning, 12*, 375–382.

Field, A. (2013). *Discovering statistics using IBM SPSS statistics* (4th ed.). SAGE.

Fredricks, J. A. (2011). Engagement in school and out-of-school contexts: A multidimensional view of engagement. *Theory into Practice, 50*(4), 327–335. https://doi:10.1080/00405841.2011.607401

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59–109. https://doi:10.3102/00346543074001059

ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

Fredricks, J. A., & McColskey, W. (2012). The measurement of student engagement: a comparative analysis of various methods and student self-report instruments. In S. Christenson, A. L. Reschy, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 319–339). Springer. https://doi:10.1007/978-1-4614-2018-7_37

Fredricks, J. A., Filsecker, M., & Lawson, M. A. (2016). Student engagement, context, and adjustment: Addressing definitional, measurement, and methodological issues. *Learning and Instruction*, *43*, 1–4. https://doi:10.1016/j.learninstruc.2016.02.002

Gilbert, J. (2007). Catching the Knowledge Wave: Redefining knowledge for the post-industrial age. *Education Canada*, *47*(3), 4-8.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). A primer on partial least squares structural equation modeling (PLS-SEM) (2nd ed.). SAGE.

Hamilton, M. B. (2003). *Online survey response rates and times: Background and guidance for industry.* Tercent Inc.

Hartnett, M., St. George, A., & Dron, J. (2011). Examining motivation in online distance learning environments: Complex, multifaceted and situation-dependent. *The International Review of Research in Open and Distance Learning*, *12*(6), 20–38.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modelling, *Journal of the Academy of Marketing Science, 43*(1), 115-135.

Hong, A. J., & Kim, H. J. (2018). College students' Digital Readiness for Academic Engagement (DRAE) scale: Scale development and validation. *Asia-Pacific Education Researcher*, *27*(4), 303–312. https://doi.org/10.1007/s40299-018-0387-0.

Jeongju Lee, Hae-Deok Song, & Ah Jeong Hong (2019). Exploring factors, and indicators for measuring students' sustainable engagement in e-learning. *Sustainability, 11*(4), 985. https://doi.org/10.3390/su11040985

Jones, C. (2012). Networked learning, stepping beyond the Net Generation and digital natives. In L. Dirckinck-Holmfeld, V. Hodgson, & D. McConnell (Eds.), *Exploring the theory, pedagogy and practice of networked learning* (pp. 27–41). Springer.

Junco, R., Heiberger, G., & Loken, E. (2011). The effect of twitter on college student engagement and grades. *Journal of Computer Assisted Learning, 27*(2), 119–132.

Kim, H., Hong, A., & Song, H. D. (2018). The relationships of family, perceived digital competence and attitude, and learning agility in sustainable student engagement in higher education. *Sustainability*, *10*(12), 4635.

Kock, N., & Lynn, G. S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, *13*(7), 546-580.

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration, 11*(4), 1-10.

Lee, J.; Song, H. -D., & Hong, A. J. (2019). Exploring Factors, and Indicators for Measuring Students' Sustainable Engagement in e-Learning. *Sustainability*, *11*, 985.

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students' use of digital technologies. *Computers & Education*, *56*(2), 429–440. https://doi.org/10.1016/j.compedu.2010.09.004.

Martin, F., Stamper, B., & Flowers, C. (2020). Examining student perception of readiness for online learning: Importance and confidence. *Online Learning Journal,* 24(2), 38–58. https://files.eric.ed.gov/fulltext/EJ1260328.pdf

Martens, R. L., Gulikers, J., & Bastiaens, T. (2004). The impact of intrinsic motivation on e-learning in authentic computer tasks. *Journal of Computer Assisted Learning*, *20*(5), 368–376. https://doi:10.1111/j.1365-2729.2004.00096.x

Mediating Effect of Digital Readiness on the
Relationship between Online Peer Collaboration,
Psychological Motivation and Online Engagement in
Malaysian Online Distance Learning Higher Institutions

ASEAN Journal of Open and Distance Learning
Vol. 13, No. 2, 2021, pp. 21 - 31

Meyer, K. A. (2010). A comparison of web 2.0 tools in a doctoral course. *The Internet and Higher Education,* *13*(4), 226–232.

Novak, E., Razzouk, R., & Johnson, T. E. (2012). The educational use of social annotation tools in higher education: A literature review. *The Internet and Higher Education, 15*(1), 39–49.

Redecker, C., Ala-Mutka, K., & Punie, Y. (2010). *Learning 2.0-the impact of social media on learning in Europe: Policy brief.* (EUR JRC56958 EN). European Commission, Joint Research Centre. https://bit.ly/cljlpq.

Ringle, C. M., Wende, S., & Becker, J.-M. (2015). SmartPLS 3. Boenningstedt: *SmartPLS GmbH.* https://www.smartpls.com/

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology, 25*(1), 54–67. https://doi: 10.1006/ceps.1999.1020

Sachdev, S. B., & Verma, H. V. (2004). Relative importance of service quality. *Journal of Services Research*, *4*(1), 93-116.

Schunk, D. H. (1995). Self-efficacy and education and instruction. In J. E. Maddux (Ed.), *Self-efficacy, adaptation, and adjustment: Theory, research, and application* (pp. 281–303). Plenum Press.

Schunk, D. H., Pintrich, P. R., & Meece, J. L. (2008). *Motivation in education* (3rd ed.). Pearson Merrill Prentice Hall.

Shroff, R. H., Vogel, D. R., & Coombes, J. (2008). Assessing individual-level factors supporting student intrinsic motivation in online discussions: A qualitative study. *Journal of Information Systems Education, 19*(1), 111–125.

Sinatra, G. M., Heddy, B. C., & Lombardi, D. (2015). The challenges of defining and measuring student engagement in science. *Educational Psychologist*, *50*(1), 1–13. https://doi:10.1080/00461520.2014.1002924

Xie, K., DeBacker, T. K., & Ferguson, C. (2006). Extending the traditional classroom through online discussion: The role of student motivation. *Journal of Educational Computing Research, 34*(1), 67–89. https://doi:10.2190/7BAK-EGAH-3MH1-K7C6

Warner, D., Christie, G., & Choy, S. (1988). *Readiness of VET clients for flexible delivery including online learning.* Australian National Training Authority.

Wighting, M. J., Liu, J., & Rovai, A. P. (2008). Distinguishing sense of community and motivation characteristics between online and traditional college students. *Quarterly Review of Distance Education*, *9*(3), 285–295.

Willms, J.D., Friesen, S., & Milton, P. (2009). *What did you do in school today? Transforming classrooms through social, academic, and intellectual engagement.* Canadian Education Association.

Zahir Osman, Ratna Khuzaimah Mohamad, & Liana Mohamad, (2021). Enhancing Students' Online Engagement: A Study on Online Distance Learning Institutions' Students. *GATR Global J. Bus. Soc. Sci. Review*, *9*(3), 207 – 215. https://doi.org/10.35609/gjbssr.2021.9.3(2), https://ssrn.com/abstract=3938738

Zahir Osman, Wardah Mohamad, Ratna Khuzaimah Mohamad, Liana Mohamad, & Tuan Fatma Tuan Sulaiman. (2018). Enhancing students' academic performance in Malaysian online distance learning institutions. *Asia Pacific Journal of Educators and Education*, *33,* 19–28.