

# What Factors Influence Online Distance Learners' Engagement? Malaysian Student's Perspective

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## Abstract

This study evaluates both direct relationships between online learning attitudes, online peer collaboration, psychological motivation, and online engagement, as well as the indirect relationship between online learning attitudes, online peer collaboration, and online engagement, mediated by psychological motivation. This study uses a purposive sampling of three Malaysian ODL higher education students, and 307 were analyzed. The survey questionnaire uses a five-point Likert scale for 20 observed variables representing four constructs. The SmartPLS3 is used for data analysis and hypothesis testing. Online learning attitude and online peer collaboration influenced psychological motivation, with online peer collaboration having a stronger influence. Online learning attitude and online peer collaboration were found to have a direct positive relationship with online engagement. Psychological motivation mediated the relationship between online learning attitude and online engagement. The originality of this study is the holistic approach to investigating the relationships between factors influencing online distance learners' engagement within the context of ODL higher education institutions. New insights from this study enable strategies to promote collaborative learning environments, motivation, and ODL students' online engagement. The findings demonstrated that an online learning attitude and peer collaboration are essential antecedents to online engagement, while psychological motivation significantly strengthens the learners' online engagement. Higher education institutions engaged in Open Distance Learning (ODL) should cultivate a sense of community and collective academic effort to enhance positive attitudes towards online learning and boost psychological motivation.

**Keywords:** Online Engagement, Online Learning Attitude, Online Peer Collaboration, Psychological Motivation, Online Distance Learning

## Introduction

The expansion of universities' online presence and the rise in fully online study options have made student online engagement a critical issue that warrants deeper examination and analysis. Most online learners are non-traditional students who are adult learners with

multiple responsibilities and trying to balance commitments of work, family and study (Jennings, 2021; Eakins and Eakins, 2021). They have chosen to study online for the program's flexibility and convenience. As such, online student engagement has become an important area worth investigating and requires further exploration (Lup and Mitrea, 2021).

The rapid expansion of online learning platforms has fundamentally changed the educational landscape. As a result, transitioning higher education institutions from traditional face-to-face to online teaching presents new challenges for course design and pedagogical practice. Thus, universities have explored asynchronous and synchronous learning pedagogies, improving technological readiness, usage and teaching methods (Imonje, 2021; Kim *et al.*, 2022). As a result, engagement is becoming increasingly important in online learning (Malan, 2020; Deslauriers, 2019; Paulsen & McCormick, 2020; Brown *et al.*, 2023; Bedi, 2023). Increased student engagement in the learning process improves students' attention and concentration, encourages them to employ critical thinking abilities at a higher level, and creates possibilities for meaningful learning experiences. Gaining greater student engagement in learning makes it more joyful and motivating, ensuring that students remain interested, concentrated, and motivated to gain the skills and knowledge taught in the classroom. Studies show that when students take an active role in their learning, they become more motivated and reach higher levels of achievement. Learners who are enthusiastic about their studies are more engaged, focused, and eager to make significant efforts to acquire new skills and knowledge. According to a previous study, external commitments and pressures have led to higher student attrition rates (Redmond *et al.*, 2018). Increased engagement helps students achieve and helps educational institutions retain students, which is critical for educational institutions to prosper (Sengupta and Williams, 2020; Wilcox, 2020).

### **Problem Statement**

Despite the fact that student involvement in online learning has been highlighted, one of the most significant concerns in online learning has been a lack of engagement. Hence, it has contributed to the failure of online education (Lup and Mitrea, 2021). At all ODL higher education institutions, the online engagement rate among ODL students is still relatively low (Abdullah and Said, 2022). Many educators are still struggling to keep their students interested in what they learn in the online classroom. However, while some students thrive in this setting, others get bored and uninterested in their studies. In 2020, a survey was conducted with 1,618 college students across the United States about their online learning experiences. The fact that 53% of negative responses indicated that much effort is required to engage most students in online learning (Statista, 2022). Those who registered for more online courses were likelier to engage in quantitative reasoning.

In contrast to their more traditional classroom peers, they were less likely than their more traditional classroom peers to participate in collaborative learning, student-faculty interactions, and group discussions (Dumford and Miller, 2018). Examining the various factors that affect learners' online engagement is essential for the effectiveness of online learning programs (Purarjomandlangrudi *et al.*, 2016). Student engagement is influenced by many factors, including attitude (Tani *et al.*, 2021; Tian *et al.*, 2020), personality, motivation (Kim and Doo, 2022), effort, and self-confidence (Mandernach *et al.*, 2011). In addition, online learning attitudes and digital readiness are also major determinants (Osman *et al.*, 2021).

### Research Objectives

The elements of online learning attitude, psychological motivation and online peer collaboration were explored in this study to determine what factors influenced online engagement among learners in online distance learning higher education institutions. More specifically, the objectives of this study are:

1. To examine the direct relationships between online learning attitude, online peer collaboration, psychological motivation, and online engagement
2. To examine The direct relationships between online learning attitude, online peer collaboration, and psychological motivation
3. To assess The indirect relationship between online learning attitude, online peer collaboration, and online engagement through psychological motivation

This study attempts to shed light on the definition of online engagement while acknowledging its significance in assessing the efficacy of online learning. By integrating social identity theory and the service-dominant logic, higher learning institutions may understand how students' online engagement is developed. More importantly, as online learning becomes more prevalent in education, studying the long-term effects can help universities understand student engagement and psychological motivation. If the service provider fails to manage student involvement in co-creating a service, online learning can be ineffective and damage the university's reputation.

### Literature Review

#### *Online Engagement*

In universities, student engagement has become one of the most ubiquitous buzzwords (Gibbs, 2014). According to Krause (2005), student engagement is the time, effort, and money students invest in university-level learning-related activities. In a similar vein, student engagement was defined by the Macquarie University Learning and Teaching Centre (2009) as the degree or calibre of students' commitment to and participation in their education. Student engagement, conceptual structure, and theory are defined using a study on traditional classroom teaching practices. Engaging students in educationally effective activities involves active participation in educationally effective activities, commitment to educational goals, and how they pay attention, contribute and put forth effort. The level of engagement an individual demonstrates directly impacts his or her capacity and willingness to learn and apply the information and skills offered. Student engagement has also been characterized as the degree to which students are interested in the things being taught, how they interact with their classmates, and their desire to learn more about the issues being taught (Briggs, 2015). While traditional classroom and online instruction use very different teaching and learning strategies, both emphasise the importance of the student's learning process and demand active participation from the learner (Hu and Li, 2017). Improved student engagement increases student satisfaction and learning motivation, lowers loneliness, and improves student performance in online courses (Martin and Bolliger, 2018). Students' engagement is critical to gaining the knowledge and skills necessary to succeed (Mandernach B. *et al.*, 2011). Schools can actively promote student engagement and achievement by recognizing and fostering student engagement. As a result, it is a significant indicator and predictor of the overall quality of the student experience in higher education learning institutions. Even though the overall number of students utilizing an online learning environment has expanded dramatically, the proportion of actively engaged students has

declined significantly and is insufficient (Peng, 2017). It is not enough to merely examine the number of learners using an online learning environment to evaluate its impact. More studies need to consider the students' engagement as an essential factor in the online learning environment (Spitzer *et al.*, 2021; Peng, 2017).

#### *Online Learning Attitude*

Behavioural, emotional, and cognitive engagement are three crucial areas covered in a large portion of the literature on online engagement (Reeve and Tseng, 2011), which indicates that online engagement affects students' attitudes and motivations. Alternatively, studies have also shown that students' attitudes toward online learning have been found to influence their online engagement (Osman *et al.*, 2021). Attitude is the key to online learning success, and it is characterized by what people think and feel about an attitude object and how they behave toward it. As a result, student attitudes about online learning are crucial in a learning environment supported by online learning resources. Students' attitudes are also very important in online mentoring; online mentoring is more likely to occur if the learner has a positive attitude (Dahalan *et al.*, 2012), where a positive attitude and digital literacy will enhance self-efficacy, which will enhance online learning behaviours (Prior *et al.*, 2016).

#### *Another Study*

According to a study, students prefer to learn mathematics on an online learning platform because they are actively engaged in online activities, quizzes, assignments, and cooperation. Students also had a favourable attitude towards mathematics online learning because they anticipated a promising future in understanding and achieving in online discussions, activities, assignments, and teamwork (Rural *et al.*, 2022). In another study, a survey of more than 48 Facebook pages spanning nine product categories and 448 customers found that attitude toward the community, product involvement and proclivity for online interaction all influence social media engagement. (Dessart, 2017)

#### *Online Peer Collaboration*

E-collaborations, which reflect social relationships among online peers, are opportunities for online learning. According to Coates (2006), social connections are as vital as academic participation. Thus, in an online environment, students actively involved in online forums may gain knowledge from their peers. Peer collaboration, which inspired feelings of belonging and support, was found to have a strong psychological influence on online student engagement (Farrell and Brunton, 2020). Peer collaboration was the most effective method of exchanging strategies, leading to higher engagement in literacy activities and a greater commitment to learning (Henry *et al.*, 2012). Learners participating in collaborative online distance learning may improve their digital and technical skills. Participants viewed these peer communities as an essential source of support, comfort, encouragement, and human connection, and many expressed gratitude for their contributions.

Furthermore, there would be many ideas and debates during the discussion among peers, which may enhance the learning process. According to a study conducted on 165 first-year undergraduates at one university in the United Kingdom, students' perceptions of their contribution to the group activity promote engagement and help them learn more effectively in groups (Adesina *et al.*, 2022). Peer collaboration also helps learners to engage more during peer review. They can perceive the connection between their knowledge and their

coursework, allowing learners to share their knowledge, discuss it, and become better critical thinkers.

### *Psychological Motivation*

Motivation is one of the most important aspects influencing the performance and success of learners. Psychological motivation can be intrinsic and extrinsic. In contrast to extrinsic motivation, which refers to performing an activity to achieve a distinct goal, intrinsic motivation refers to people's propensity to engage in activities that interest them and, in doing so, help them to learn, develop, and expand their capacities (Ryan and Deci, 2000). In contrast to the elements of student engagement assessment instruments designed for in-person learning environments, interactions with teachers, psychological drive, peer support, and cognitive problem-solving were frequently observed (Lee et al., 2019). As a result, when designing an online environment, the students' psychological motivation is critical (Nehme, 2010).

Furthermore, one finding revealed that students' motivation is significantly related to their participation in online discussions (Xie and Ke, 2010). According to Kanellopoulou and Giannakoulopoulos (2020), intrinsic motivation in foreign language acquisition leads to greater active engagement, deeper learning, and higher academic performance. Furthermore, a study of 1,201 online students examined how the three psychological needs they perceived affected their level of engagement (Chiu, 2022). Another study discovered that participants had high intrinsic motivation for and engagement in Chinese learning (Zang F. et al., 2022). On the other hand, according to the findings of a qualitative case study, students believe that online education is harmful to their motivation because of a lack of social interaction, an expectation-content mismatch, organizational issues and learning environments (Esra and Sevilen, 2021). Previous case studies found a link between online participation and motivation. Participants who reported high motivation levels were more visibly active in discussion topics. On the other hand, other case studies revealed no significant relationship between participant's online activity and level of motivation (Hartnett, 2012). Although motivation is an important consideration in the online learning environment (Hartnett, 2016), previous studies have mainly neglected the significance of motivation in the online learning environment, believing that e-learners are self-motivated and active learners.

### **Hypotheses Development**

#### *Relationship between Psychological Motivation and Online Engagement*

One of the most significant psychological ideas in education, according to Valland et al. (1992), is intrinsic motivation. Individuals who possess intrinsic motivation participate in activities that facilitate their learning, growth, and enhancement of skills (Ryan and Deci, 2000). Some studies show that psychological motivation becomes the most far-reaching and integrative construct in understanding human nature (Kanellopoulou and Giannakoulopoulos, 2020; Lee, et al., (2019). This is because, according to social identity theory, people's psychological motivation is assigned some fundamental power to influence their behaviours (Graham, 2011). In the context of higher education, Arif and Ilyas (2013), emphasised that strong psychological motivation fosters student engagement, which in turn enhances student loyalty and positive responses, serving as a crucial input variable for the provision of higher education. In accordance with strong theoretical and empirical support, this study

hypothesises the following relationship between students' psychological motivation and online engagement:

*H1: There is a significant positive relationship between psychological motivation and online engagement among students of online learning higher education institutions.*

#### *Relationship between Online Learning Attitude and Psychological Motivation and Online Engagement*

In addition to technologies and administrative features, students' individual and behavioural factors significantly influence their motivation and engagement. Some of these behavioural factors are students' self-efficacy (Kuo *et al.*, 2014), levels of readiness and computer literacy (Demir and Horzum, 2013), learning styles (Hao, 2006), and attitude towards distance and online learning (Brooks *et al.*, 2004). It was also evident in the study by Osman *et al.* (2021) that students' attitudes toward online learning influence their online engagement. In an online environment, the students' psychological motivation is critical (Nehme, 2010). Online learning is more likely to occur if the learner has a positive attitude (Dahalan *et al.*, 2012), where a positive attitude and digital literacy will enhance students' motivation, ultimately enhancing online learning behaviours (Prior *et al.*, 2016). In higher education, students' attitudes towards learning are important to the overall educational experience, and therefore, institutions need to stay relevant in the industry (Verghese and Kamalanabhan, 2015). Therefore, this study hypothesizes that a student's attitude significantly affects psychological motivation and, ultimately, students' online engagement.

*H2: There is a significant positive relationship between online learning attitude and psychological motivation among students of online learning higher education institutions.*

*H3: There is a significant positive relationship between online learning attitude and online engagement among students of online learning higher education institutions.*

#### *Relationship between Online Peer Collaboration and Psychological Motivation and Online Engagement*

Tajfel (1979) suggested that affiliations with groups like social class, family, and football teams serve as significant sources of pride and self-esteem for individuals. Collectives provide a sense of social identity, connecting us to the broader social landscape. Their affiliations with various groups shape a person's sense of self. Peer collaboration, which inspired feelings of belonging and support, was found to have a strong psychological influence on online student engagement (Farrell and Brunton, 2020). Peer collaboration was the most effective method of exchanging strategies, leading to higher engagement in literacy activities and a greater commitment to learning (Henry *et al.*, 2012). In concurrence with the strong theoretical and empirical support, this study hypothesizes the connection between students' online peer collaboration and psychological motivation and online engagement as follows:

*H4: There is a significant positive relationship between online peer collaboration and psychological motivation among students of online learning higher education institutions*

*H5: There is a significant positive relationship between online peer collaboration and online engagement among students of online learning higher education institutions.*

*The Mediating Role of Psychological Motivation in Online Attitude Online Engagement Linkage*

Social Identity Theory suggests that an exchange cannot be established without the central role of psychological motivation to secure the relationship between an individual's attitude and behaviour towards the object or learning (Zafirovski, 2005). Significantly, any effort to develop psychological motivation between attitude and students will likely create a greater bonding and favourable response (Johnson, Herrmann & Huber, 2006). Nevertheless, its evidence in higher education, particularly online, is relatively silent. Therefore, this study hypothesizes the role of psychological motivation in linking students' online attitudes with online engagement, as follows:

*H6: Psychological motivation mediates the relationship between online learning attitude and online engagement among students of online learning higher education institutions.*

*The Mediating Role of Psychological Motivation in Online Peer Collaboration Online Engagement Linkage*

According to Farrell and Brunton, in 2020, peer collaboration had a strong psychological influence on online student engagement. Students' perceptions of their contribution to the group activity promote engagement and help them learn more effectively in groups (Adesina et al., 2022).

Students' motivation is significantly related to their participation in online discussions (Xie and Ke, 2010). According to Kanellopoulou and Giannakoulopoulos (2020), intrinsic motivation leads to greater active engagement, deeper learning and higher academic performance. Therefore, this study hypothesizes the role of psychological motivation in linking students' online peer collaboration and online engagement as follows:

*H7: Psychological motivation mediates the relationship between online peer collaboration and online engagement among students of online learning higher education institutions.*

### **Research Framework**

Within the higher education service delivery framework, students actively participate as co-creators, generating authentic value in the educational process. They engage in meaningful interactions and collaborate closely with educators (Dollinger et al., 2018). Understanding the service value co-creation process in higher education is crucial because its effectiveness can only be achieved through the involvement of learners to co-create the service (Vargo and Lusch, 2008; Wæraas and Solbakk, 2009). Thus, students' positive attitudes towards online learning would influence their involvement in co-creating the education service delivery, thus making it more effective.

The discussion on online peer collaboration as a factor that contributes to students' online engagement is underpinned by the Social Identity Theory (Tajfel et al., 1979), which posits that psychological motivations lead a group member to endorse an existing group membership. Turner et al. (1987) characterised this motive as necessary for group members to distinguish their groups favourably from others to attain a positive social identity (Tajfel et al., 1979). Thus, student online engagement is driven by students' collaboration with other online peers, which motivates them psychologically (Mitchell et al., 2012).

With the above discussions, this study aims to investigate the effect of students' online learning attitude and peer collaboration on psychological motivation, ultimately affecting

their online engagement. The following diagram depicts the relationships among the independent variables of Online Learning Attitude (OLA) and Online Peer Collaboration (OPC), the mediating variable of psychological motivation (PM) and the dependent variable of Online Engagement (OE).

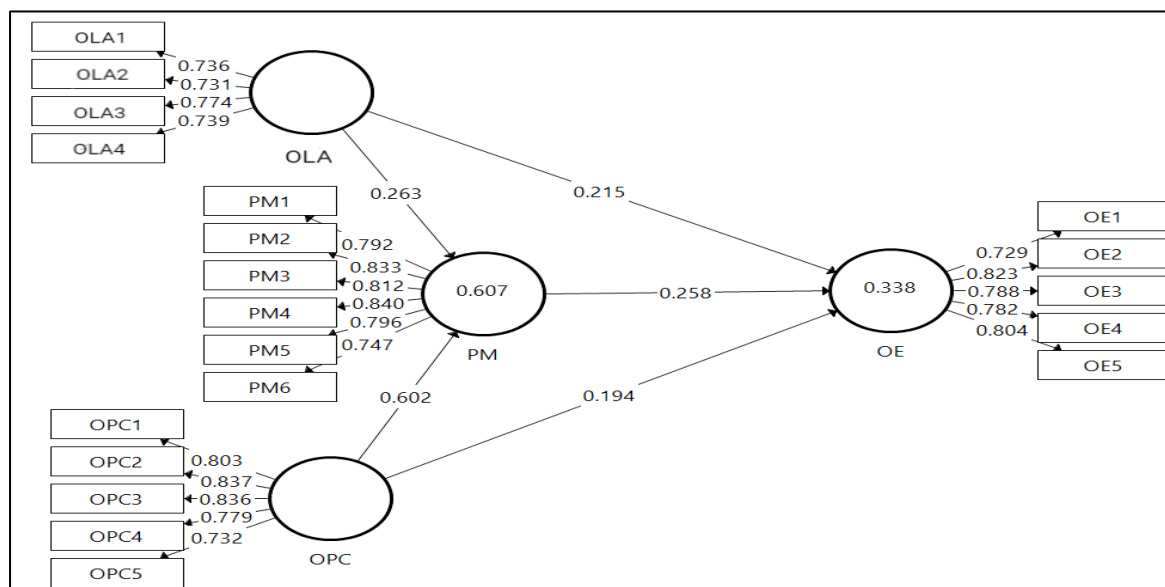


Fig. 1. Research Framework

## Methodology

The survey questionnaire consists of 20 observed variables representing four constructs based on past studies. Online learning attitude was measured by four measurement items (Chu and Chen, 2016), online peer collaboration was measured using five measurement items (Lee *et al.*, 2019), the mediating construct of psychological motivation has six measurement items (Lee *et al.*, 2019), and online engagement, has five measurement items (Dixon, 2015). Each construct's measurement items were assessed using a five-point Likert scale, where 5 represented strongly agree while 1 indicated strongly disagree. The reliability coefficient of the various constructs is depicted in Table 1.

A self-administered questionnaire utilising a 5-point Likert scale derived from previous literature was employed for data collection. Students from Malaysia's ODL higher education institutions participated in this study. A survey was conducted utilising the purposive sampling technique across three ODL universities in Malaysia, specifically Open University Malaysia, Wawasan University and Asia e University, using a questionnaire distributed to 425 students as the study's sample population. 321 questionnaires were obtained, giving a 75.52% response rate. Therefore, analysing the data using the structural equation modelling PLS-SEM technique was adequate. Screening and removal of outlier processes resulted in 307 usable questionnaires. SmartPLS 3 was used to perform multivariate data analysis and hypotheses testing and evaluate the measurement and structural model.

## Data Analysis

### Common Method Bias

The variance inflation factor (VIF) greater than 3.3 occurrences implied the existence of the collinearity problem. In addition, it signifies that the model faces a problem of common



method bias. Consequently, if the VIFs at every factor level obtained from a comprehensive collinearity assessment are equal to or below 3.3, the model is devoid of any concerns regarding common method bias (Kock, 2015), as depicted in Table 1.

Table 1  
*Collinearity Statistics (VIF)*

	OE	OLA	OPC	PM
OE		1.365	1.426	1.433
OLA	1.444		1.503	1.496
OPC	2.476	2.465		1.525
PM	2.488	2.453	1.525	

#### *Measurement Model*

This study applied the PLS-SEM algorithm to assess the path model and verify the developed measurement's reliability and validity. Hair et al. (2017) stated that reliability and validity were the two most relevant PLS-SEM criteria for investigating outer model goodness. Consequently, the outer model underwent an initial evaluation to measure the reliability and validity of the measurement items. The statistical results showed that the Average Variance Extracted (AVE) was met with all the constructs' AVE ranging from 0.555 to 0.647 (refer to Table 2), which were larger than the minimum requirement of 0.50, thus verifying the existence of convergent validity for all latent constructs (Hair et al., 2012). Furthermore, as shown in Table 2, the composite reliability ranged from 0.833 to 0.916 for first-order constructs. Thus, it met the 0.70 and above criterion (Hair et al., 2017).

Moreover, cross-loading of the measurement items of respective constructs was evaluated to substantiate the existence of discriminant validity in this study. The statistical results showed that all item loadings were larger than their respective cross-loadings, as depicted in Table 3. Hetrotrait-Monotrait (HTMT) ratios were computed to confirm the discriminant validity. The statistical results demonstrated that all ratios of the four constructs were < 0.9, as in Table 4 (Henseler et al., 2015). Therefore, the full bootstrapping was executed for HTMT. As a result, the reliability and validity of the latent constructs were demonstrated in this study (Hair et al., 2014).

Table 2  
*Construct Reliability and Validity*

	CA	CR	AVE
OLA	0.845 (0.809, 0.875)	0.833 (0.795, 0.863)	0.555 (0.492, 0.611)
OE	0.845 (0.809, 0.875)	0.890 (0.867, 0.909)	0.618 (0.567, 0.666)
OPC	0.857 (0.817, 0.886)	0.898 (0.873, 0.917)	0.638 (0.580, 0.688)
PM	0.890 (0.858, 0.914)	0.916 (0.894, 0.933)	0.647 (0.584, 0.700)

Notes: CA=Cronbach Alpha; CR=Composite Reliability; AVE=Average Variance Extracted

Table 3

*Cross Loadings*

	OLA	OE	OPC	PM
OLA1	<b>0.736</b>	0.332	0.379	0.384
OLA2	<b>0.731</b>	0.414	0.421	0.503
OLA3	<b>0.774</b>	0.321	0.410	0.436
OLA4	<b>0.739</b>	0.338	0.430	0.436
OE1	0.335	<b>0.729</b>	0.329	0.334
OE2	0.347	<b>0.823</b>	0.441	0.422
OE3	0.349	<b>0.788</b>	0.387	0.356
OE4	0.397	<b>0.782</b>	0.399	0.480
OE5	0.431	<b>0.804</b>	0.422	0.473
OPC1	0.432	0.400	<b>0.803</b>	0.574
OPC2	0.432	0.426	<b>0.837</b>	0.602
OPC3	0.458	0.423	<b>0.836</b>	0.556
OPC4	0.463	0.413	<b>0.779</b>	0.657
OPC5	0.415	0.354	<b>0.732</b>	0.587
PM1	0.519	0.480	0.628	<b>0.792</b>
PM2	0.471	0.400	0.619	<b>0.833</b>
PM3	0.483	0.412	0.592	<b>0.812</b>
PM4	0.521	0.463	0.664	<b>0.840</b>
PM5	0.433	0.375	0.555	<b>0.796</b>
PM6	0.435	0.426	0.534	<b>0.747</b>

Table 4

*Hetrotrait-Monotrait (HTMT) Ratio*

	OLA	OE	OPC
OE	0.594 (0.460, 0.711)		
OPC	0.692 (0.562, 0.800)	0.590 (0.480, 0.686)	
PM	0.726 (0.596, 0.833)	0.603 (0.488, 0.705)	0.851 (0.773, 0.905)

Note: A two-tail percentile bootstrap test at a 5% confidence interval (2.5%, 97.5%) with 5,000 sub-samples was performed

*The Structural Model Estimation*

The structural model assessment applied path and determination coefficient (R<sup>2</sup>) values (Hair et al., 2012). PLS was used to bootstrap 5000 subsamples to confirm the path coefficients' significance level. Table 5 displays the path coefficient hypothesis testing results—(Beta), t-statistics, p-value, and confidence interval. For *hypothesis 1*, the statistical result shows that online learning attitude positively and significantly influences online engagement ( $\beta=0.215$ ,  $t=3.553$ ,  $p=0.000$ ); therefore, *H1* is supported. Then, for *hypothesis 2*, the statistical result shows that online learning attitude has a positive and significant relationship with psychological motivation ( $\beta = 0.263$ ,  $t = 4.4887$ ,  $p=0.000$ ); thus, *H2* is supported. For *hypothesis 3*, the statistical result showed that online peer collaboration positively and significantly influenced online engagement ( $\beta=0.194$ ,  $t=2.587$ ,  $p=0.000$ ); therefore, *H3* is supported. For *hypothesis 4*, the statistical result revealed that online peer collaboration positively and significantly influenced psychological motivation ( $\beta=0.602$ ,  $t=11.630$ ,  $p=0.000$ ).

Therefore, *H4* is supported. For hypothesis 5, psychological motivation has a positive and significant influence on online engagement ( $\beta=0.258$ ,  $t=3.216$ ,  $p=0.000$ ); hence *H5* is supported. Hypothesis 6 shows that psychological motivation mediates the relationship between attitude and online engagement ( $\beta=0.068$ ,  $t=2.454$ ,  $p=0.014$ ), confirming that *H6* is supported. For hypothesis 7, the statistical result shows that psychological motivation significantly mediates the relationship between online peer collaboration and online engagement ( $\beta=0.156$ ,  $t=3.156$ ,  $p=0.002$ ); therefore, *H7* is supported. The summary of the hypotheses testing results is presented in Table 5.

Table 5  
*Hypotheses Testing Results*

Hypotheses	Beta	T Statistics	P Values	2.50%	97.50%	Decision
<i>H1</i> OLA -> OE	0.215	3.553	0.000	0.09	0.323	<i>Supported</i>
<i>H2</i> OLA -> PM	0.263	4.487	0.000	0.147	0.375	<i>Supported</i>
<i>H3</i> OPC -> OE	0.194	2.587	0.010	0.042	0.333	<i>Supported</i>
<i>H4</i> OPC -> PM	0.602	11.630	0.000	0.494	0.696	<i>Supported</i>
<i>H5</i> PM -> OE	0.258	3.216	0.001	0.101	0.415	<i>Supported</i>
<i>H6</i> OLA -> PM -> OE	0.068	2.454	0.014	0.023	0.133	<i>Supported</i>
<i>H7</i> OPC -> PM -> OE	0.156	3.156	0.002	0.062	0.255	<i>Supported</i>

## Discussions

This study examined the factors influencing online engagement among ODL students in ODL higher education institutions. Those factors that have been studied were online learning attitude, psychological motivation, online peer collaboration, and online engagement among students of online distance learning higher education institutions. The statistical data analysis revealed that online peer collaboration strongly influences psychological motivation ( $\beta = 0.602$ ). Online learning attitude less influences psychological motivation ( $\beta = 0.263$ ) than online peer collaboration. Since online peer collaboration and online learning attitudes positively and significantly influence psychological motivation, ODL higher education institutions must focus on these two factors. Greater emphasis must be placed on online peer collaboration to positively impact students' psychological motivation.

Furthermore, the direct relationship between online learning attitude and online engagement is significant. This demonstrates that an online learning attitude is an antecedent to psychological motivation and online engagement. Further, a mediator, psychological motivation, complements the relationship between online learning attitude and online engagement ( $\beta=0.068$ ,  $t=2.454$ ,  $p=0.014$ ). Hence, ODL institutions must continuously encourage and assist their online learners to adopt and inculcate a good and positive online learning attitude to bring their motivation level to greater heights and eventually lead the learners to be more active in the online engagement of their online study. By strengthening online peer collaboration and online learning attitudes, online learners will be more motivated, leading them to be more engaged in their online studies.

The effect of psychological motivation confirms that the influence of online peer collaboration on online engagement is indirectly related to psychological motivation as a mediator ( $\beta=0.156$ ,  $t=3.156$ ,  $p=0.002$ ). Therefore, ODL institutions must holistically look into online peer

collaboration, psychological motivation, and online engagement. Meanwhile, the online learning attitude is not as strong as online peer collaboration in influencing psychological motivation. However, it still needs serious attention. ODL students with the right online attitude are more motivated in their studies. Therefore, lecturers at ODL higher institutions must mould their learners to develop the right attitude toward online learning in every online class.

ODL higher education institutions need to develop a strategy for designing online activities. They should put in place dedicated online platforms that promote collaborative learning. Discussion boards, virtual study groups, peer review mechanisms, and collaborative project spaces could all be part of these platforms. Institutions can provide students with structured spaces to interact, share ideas and collectively engage with course materials by integrating and encouraging the use of such platforms. Doing so will give more opportunities for the students to interact with their peers online and develop their online study groups. This will promote the development of a positive attitude towards online learning and boost psychological motivation by fostering a sense of community and shared academic endeavour. Institutions should focus on creating inclusive and supportive online communities to increase psychological motivation and online engagement. Through the support of each other, the students' psychological motivation will increase their tendency to be more engaged in their online studies. ODL students need to be encouraged to study in groups and communicate with other students through online forums. Students who have difficulties comprehending the study material will benefit from online peer collaboration with higher motivation and increase their online engagement with their peers and tutors. Students can reduce feelings of isolation through interactions and collaboration among their classmates, regardless of geographical or cultural differences. Instead of studying alone, students can depend on and assist each other to overcome the barriers in their studies. In addition, online collaboration helps solve certain study matters through active online engagement, promoting greater in-depth learning in a group atmosphere. This approach improves academic performance, fosters a sense of belonging, encourages diverse perspectives, and prepares students for global collaborative environments.

This study's findings imply that universities need to foster learning environments where traditional instructor-student and student-student interactions can be translated into an online study environment due to the common needs and aspirations of both online and conventional university learners. Coates (2006) emphasised that institutions play a crucial role in establishing environments conducive to learning and providing education opportunities; however, the ultimate responsibility for learning lies with the students themselves. In summary, the effectiveness of the online learning environment, course content, and interactions between students and instructors, students and students are significant issues for online distance learning that ODL institutions of higher learning must emphasize.

### **Limitations and Future Study**

This study is not without limitations. However, the limitations addressed in this study may provide avenues for future study directions for researchers. The context of the study was limited to students of ODL higher learning institutions. This study evaluated the mediating effect of psychological motivation of online learning attitude and online peer collaboration

on the online engagement of learners in ODL higher education institutions. By enhancing the online learning attitude and online peer collaboration among online learners, the psychological motivation of the online learners will be strengthened. With a high motivation level, students will have a more robust online study engagement. Future studies on online engagement should include other independent variables in the research framework development, such as technology readiness, tutor attitude, and self-efficacy. In addition, future studies should focus on specific aspects of online engagement, such as cognitive, social, collaborative, behavioural, and emotional engagement, as proposed by Redmond *et al.* (2018). These five elements are critical for effective online learning and teaching student engagement. Student engagement should be examined from the perspective of educators as well as from the perspective of students.

### **Conclusions**

In conclusion, this study emphasises the significant impact of online learning attitudes, peer collaboration, and psychological motivation on improving online engagement among distance learners in Malaysian higher education institutions. The results highlight that both online learning attitudes and peer collaboration contribute positively to psychological motivation, with peer collaboration exerting a more substantial influence. Psychological motivation is essential, as a key mediator connecting learning attitudes and peer collaboration to online engagement. Therefore, creating collaborative learning environments and encouraging positive online learning attitudes can significantly increase student engagement, ultimately improving the overall learning experience in online distance education.

### **Contributions**

This study provides important contributions from a theoretical and contextual perspective. From a theoretical point of view, this study extends the application of Social Identity Theory by showing how peer collaboration online and students' attitudes towards online learning affect psychological motivation and student engagement. Based on this theory, studies emphasize that social relationships and peer collaboration in an online environment are important in forming strong psychological motivation and increasing student involvement in learning (Tajfel et al., 1979). From a contextual perspective, this study contributes to the literature on open distance learning (ODL) in Malaysian higher education institutions by focusing on developing positive attitudes towards online learning and strengthening psychological motivation through online peer collaboration. This study also found that peer collaboration has a stronger influence than attitudes towards online learning in increasing student engagement (Osman et al., 2021). Therefore, the results of this study offer practical guidance for higher education institutions to design a collaborative and supportive learning environment, which can increase student motivation and engagement, thereby improving their academic performance in the context of ODL.

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