GLOBAL BUSINESS MANAGEMENT REVIEW
http://e-journal.uum.edu.my/index.php/gbmr

How to cite this article:
Nasirun, N. & Shahidan, A.N. (2024). Assessing the mediating role of student engagement on the relationship between student interactions and student performance in entrepreneurship education. *Global Business Management Review, 16*(1), 83-97. https://doi.org/10.32890/gbmr 2023.16.1.5

ASSESSING THE MEDIATING ROLE OF STUDENT ENGAGEMENT ON THE RELATIONSHIP BETWEEN STUDENT INTERACTIONS AND STUDENT PERFORMANCE IN ENTREPRENEURSHIP EDUCATION

Noraini Nasirun[1]

Athifah Najwani Shahidan[1,2]

[1] *Faculty of Business and Management, Universiti Teknologi MARA Perlis Branch, Kampus Arau, 02600 Arau, Perlis, Malaysia*

[2]*Corresponding author: athifahnajwani@uitm.edu.my*

Received: 05/05/2024 Revised: 01/06/2024 Accepted: 07/06/2024 Published: 30/06/2024

ABSTRACT

Previous literature suggested that more studies are needed in the context of technology mediated learning in entrepreneurship education. Hence, this study aims is to gauge the understanding of the factors influencing student performance for the Fundamentals of Entrepreneurship (ENT300) subject. This study is underpinned by the Social Learning Theory: Groups, Nets, and Sets. This study was conducted in the Universiti Teknologi MARA Perlis Branch (UiTM Perlis) using survey. 281 students had participated in this study. Data were analyzed using SmartPLS. Since the research model for the study was reflective-formative, the second order approach was used to assess the structural model. The results of this study reveal positive influence between Student Interactions and Student Engagement, as well as between Student Engagement and student performance variables (Satisfaction, Efficiency, and Effectiveness). Also, Student Engagement plays a significant role as a mediator between Student Interactions and student performance variables. This study contributes to the literature of the development of Social Learning Theory: Groups, Nets, and Sets. Finally, this study makes practical contributions to the higher learning institution that plans to use a technology mediated learning approach for large enrolment subject.

Keywords: Entrepreneurship Education, Massive Enrolment, Technology Mediated Learning, Student Performance, SmartPLS.

1.0 INTRODUCTION

Nowadays, technology mediated learning is no longer an option in teaching and learning in HLI. For example, during the Covid-19 outbreak, schools and HLI had opted to move their teaching and learning activities to the online platform. Previously, in the middle of 2019, the Ministry of Education had asked schools and universities to shut down their classes immediately because the air pollutant index (API) had reached an unhealthy level of above 100 (Povera & Babulai, 2019); and classes were moved online (Bernama, 2019). These unexpected conditions indicate that technology mediated learning is seen as the only alternative of teaching and learning activities if classes cannot be conducted in traditional classrooms.

Regardless of the modality of delivery techniques in teaching and learning, student performance is the ultimate focus of technology mediated learning (Broadbent, 2017). It is expected that students perform equally well as traditional classes or better in technology mediated learning environment (Anthonysamy, Koo & Hew, 2020). Even though the majority of studies show positive results in technology mediated learning, students of science and technology are performing better as compared to the social science students including entrepreneurship education in HLI (Hassan et al., 2021; Vo et al., 2017). One of the plausible problems is because, in the context of entrepreneurship education, the practitioners of technology mediated learning are struggling to integrate the available technology. Thus, they face difficulties in identifying suitable factors that influence teaching and learning activities of the subject (Ratten & Usmanij, 2020). Among factors that influence student performance are student engagement and interactions, and both factors are difficult to be measured (Raes et al., 2019). However, scholars in the technology mediated learning suggested the instructors integrate formal platforms and social media applications such as WhatsApp and Facebook to foster interactions and engagement among students, thus, improving the effectiveness of students learning (Albloy & Mohamed, 2019; Coleman & Connor, 2019; Fook et al., 2021; Talaei-khoei & Daniel, 2020).

Hence, the objectives of this study are (1) to investigate factors influencing student performance (Satisfaction, Efficiency and Effectiveness), and (2) to examine if student engagement mediates the relationship between student interactions and Student performance. The study was conducted in the context of entrepreneurship education subject that uses online learning approach for the teaching and learning activities in class. For this subject, the instructors used formal platform, social applications (WhatsApp and Facebook), and traditional face-to-face classes. Data were analyzed using SmartPLS

2.0 LITERATURE REVIEW

2.1 Social Learning Theory: Group, Nets, and Sets

As technology evolves, the existing theories in blended learning need to be revisited because the majority of those theories do not include the elements of connectivity or social software. As for that, in 2014, Dron and Anderson introduced Social Learning Theory: Group, Nets, and Sets, leveraging the advantages of social learning informal learning (Anderson, 2016).

For this study, groups refer to the formal group or class based on the group of ENT300 registered through the system. Normally the classes are created based on the program. In the formal group, students also attend a face-to-face class in the traditional classroom. Besides communicating with peers and other assignment groups of the same class, students also communicate with those from other classes. These interactions are referred to as Sets. Finally, the network or Nets. Nets encourage students to communicate with the community beyond UiTM Perlis. For this ENT300 context, students extend their network to other UiTM branches scattered throughout Malaysia – like instructors, friends, public, and practitioners to gain the knowledge and understanding to complete their assignments. To the university,

the network should be maintained as a long-term relationship for the benefits of all. For this reason, this theory was chosen to underpin this study because it can explain how the interactions happen among students in entrepreneurship education. Furthermore, this theory promotes engagement and interactions among various parties to assist in teaching and learning activities for the subject.

2.2 Technology mediated learning and entrepreneurship education in Universiti Teknologi MARA

Technology mediated learning has been used interchangeably with other terminologies such as hybrid learning (Raes et al., 2019), digital learning (Sousa et al., 2019), and e-learning (Lin et al., 2019). The percentage of technology mediated learning is identified based on student learning time (SLT), where the online activities are conducted more than 30%, and the remaining activities are covered in the traditional classes or fully online (Allen & Seaman, 2011; Nasirun et al., 2015). Entrepreneurship education is one of the important subjects in the syllabus of HLI in Malaysia, however, currently limited studies have been conducted on technology mediated learning for entrepreneurship education in HLI (Noraini et al., 2017; Sousa et al., 2019). Universiti Teknologi MARA (UiTM) is the largest university in Malaysia, where it has 35 branches in Malaysia. The fundamental of entrepreneurship (ENT300) is an entrepreneurship subject for diploma students. At UiTM Perlis, the number of enrolments for ENT300 is between 700 and 1,500 students per semester. Due to the massive enrolment every semester, since 2012 the faculty has decided to handle the management of the assessments for ENT300 using a technology mediated learning.

2.3 Development of the research framework

Technology mediated learning has created immense challenges for instructors and students. One of those challenges is student performance. Student performance can be measured using various measures, and not solely based on the exam result (Halverson et al., 2014). Besides exam results, satisfaction, effectiveness, and efficiency are also used to measure student performance (Anthony et al., 2019; Halverson et al., 2014; Kratochvil, 2014). Scholars of technology mediated learning acknowledged that satisfaction is one of the performance indicators for this area. The majority of studies found that satisfaction levels are higher among students of technology mediated learning as compared to those of traditional learning (Kuo et al., 2014; Overbaugh & Nickel, 2011; So & Brush, 2008; Wu et al., 2010). Moreover, satisfaction can be measured based on different conditions including the technology used to mediate the activities in technology mediated learning. Efficiency refers to the learning outcome or knowledge gain in relation to their learning time (Renner et al., 2014). Finally, effectiveness refers to the learning outcome such as new understanding or new knowledge that a person acquires when experiencing a technology mediated learning activity (Noesgaard & Ørngreen, 2015). Effectiveness had also been highlighted as one of the important variables in the mainstream research of technology mediated learning (Drysdale et al., 2013; Halverson et al., 2014). For this study, these three variables (satisfaction, efficiency, and effectiveness) were included in the research framework to represent student performance. This study attempts to find the explanation that students of technology mediated learning for entrepreneurship education are not only satisfied with their learning, but also understand what they learned and help them to complete their assignments in time.

Besides student performance, this study includes student interactions and student engagement in the research framework. These variables are difficult to be measured because it relates to the design of learning environment for a particular subject (Chong & Soo, 2021; Raes et al., 2019). Student interactions describe actions among individuals in the systems including individual interactions with other individuals, instructors, and content (Bernard et al., 2009). High interactions in the classroom influence engagement among students (Poysa et al., 2018). The interactions through teachers' support increase the confidence level among students, hence improving their engagement (Havik & Westergård, 2019). For student engagement, scholars found that student engagement promotes social presence, hence it gives a huge impact on achieving learning goals (Ally, 2005; Anderson, 2005). The presence

of engagement increases the students' understanding, even if it is related to the difficult concepts (Sakr, 2019). Moreover, scholars like Halverson and Graham (2019) proposed that student engagement should be the mediator in technology mediated learning environment.

Based on the above literature, we developed the research framework. Student performance is represented by three variables namely satisfaction, efficiency, and effectiveness. Meanwhile, student interactions and student engagement act as the antecedents. Finally, student engagement was also positioned as the mediator between student interactions and student performance. The study was conducted at the Universiti Teknologi MARA Perlis Branch. Students who participated in this study were those who enrolled in the course of Fundamental of Entrepreneurship (ENT300) for a particular semester.

Therefore, the hypotheses for this study are outlined as follows:

H1: Students Interactions have a positive influence on Student Engagement in the ENT300 subject.
H2: Students Engagement has a positive influence on their Satisfaction in the ENT300 subject
H3: Students Engagement has a positive influence on their Efficiency in the ENT300 subject
H4: Students Engagement has a positive influence on their Effectiveness in the ENT300 subject
H5: Students Engagement mediates the relationship between Student Interactions and Satisfaction in the ENT300 subject
H6: Students Engagement mediates the relationship between Student Interactions and Efficiency in the ENT300 subject
H7: Students Engagement mediates the relationship between Student Interactions and Effectiveness in the ENT300 subject

Figure 1 presents the research framework for the study

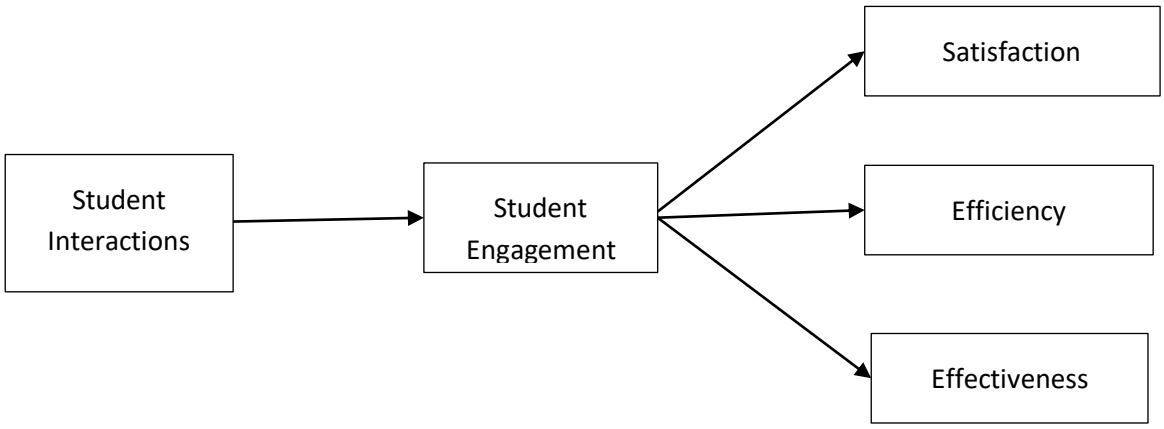

Figure 1: *Research Framework*

3.0 RESEARCH METHODOLOGY

3.1 Research Setting

In UiTM Perlis Branch, the teaching and learning activities related with ENT300 are controlled by an instructional model known as iCREATE. iCREATE is provided by the faculty to facilitate the teaching and learning activities of ENT300 for a particular semester. This instructional model integrates several technologies (such as a formal learning platform known as UFuture, WhatsApp, Facebook) with traditional learning. The respondents represented all the programs in UiTM Perlis, namely AC110-Diploma in Accountancy, AC120-Diploma in Accounting Information System, AP120-Diploma in Geomatic Science (GIS), AP122- Diploma in Geomatic Science (Natural Science), AS115-Diploma in Industrial Chemistry, AT110-Diploma in Planting Industrial Management, BM111-Diploma in Business Studies, BM119-Diploma in Banking (9.5%), CS110-Diploma in Computer Science, CS143-Diploma in Quantitative Science, and SR113-Diploma in Sports Studies.

3.2 Sampling

Data were collected among students who enrolled for the Fundamental of Entrepreneurship (ENT300) in the Universiti Teknologi MARA (UiTM). This batch consisted of 818 students. Based on Krejcie and Morgan (1970), the sample size for 850 population is 265. The selection of sampling was made using systematic sampling method from the class list or sampling frame provided by the faculty. The class list was arranged based on the students' program. From here we selected the respondents using systematic random sampling. Finally, 300 students qualified to participate in this study.

3.3 Data collection method

This study used cross-sectional data collection through self-administered survey. Questionnaires were distributed at Week 12 of the semester after students submitted their assignments. Based on the respondent selection list, we visited the classrooms 10 minutes before the class ended, distributed the questionnaires and asked students to give the response immediately. From 300 responses, only 281 questionnaires were valid for data analysis.

3.4 Measurement Design

The measurement consists of two main sections, the demographic questions and the measured item for this study. The 43 items for measured variables were adapted from previous scholars. All items were measured using a six-point Likert scale ranging from '1' as strongly disagree to '6' as strongly agree.

Student performance is a construct represented by three variables, namely Satisfaction, Efficiency and Effectiveness. Satisfaction has 5 items, while efficiency and effectiveness have 4 items each. The items for Satisfaction were adapted from Kuo et al. (2014), while Efficiency and Effectiveness were adapted from Finstad (2010).

Student Interactions was adapted from Kuo et al. (2014) and measured using three dimensions namely Student-Student, Student-Instructor, and Student-Content. Student-Student has seven items, Student-Instructor has 5 items, and Student-Content has four items. For this study, all the dimensions are required to form Student Interactions. Hence, all dimensions must be included in the analysis.

Finally, Student Engagement was adapted from Dixson (2010), and measured using three dimensions known as Emotional, Participation and Skill. Emotional has five items, Participation has six items and Skill has five items. Similarly, with Student Interaction, all dimensions are required to form Student Engagement. So, all dimensions must be included in the analysis.

The content validity for the measurement was conducted using pretesting through cognitive aspects of survey methodology (CASM). CASM involved one associate professor, the coordinator for ENT300, two senior lecturers who taught the subject and three students who had similar inclusion criteria for the respondents of this study. The measurement was amended based on these comments and presented to the ethical board for approval before the actual study started.

4.0 DATA ANALYSIS AND FINDINGS

4.1. The Profiles of the Respondents

There were 281 data valid for analysis. The majority of the respondents were female (71.2%), and male (28.8%). The age groups for those respondents were 20 years old (73.7%), 21 years old (22.1%), 22 years old (3.2%), 23 years old (7%) and 25 years old (4%). The respondents were representing all the programs offered by UiTM Perlis, namely AC110-Diploma in Accountancy (7.8%), AC120-Diploma in Accounting Information System (4.3%), AP120-Diploma in Geomatic Science (GIS) (6.8%), AP122-Diploma in Geomatic Science (Natural Science) (4.6%), AS115-Diploma in Industrial Chemistry (2.1%), AT110-Diploma in Planting Industrial Management (18.1%), BM111-Diploma in Business Studies (8.5%), BM119-Diploma in Banking (14.9%), CS110-Diploma in Computer Science (9.6%), CS143-Diploma in Quantitative Science (6.4%), and SR113-Diploma in Sport Studies (16.7%). Finally, the type of students was business (35.6%) and non-business (64.4%).

4.2. Preliminary Analysis

In the preliminary analysis, we analyzed normality and common method variance. We used the skewness and kurtosis calculator provided by the https://webpower.psychstat.org/ to test the normal distribution for this data set (Cain & Zhang, 2016). The result shows, skewness: $\beta = 1.732$, or for kurtosis: $\beta = 44.073$; indicating that the data distribution is not normal. Hence, this set of data is eligible for non-parametric analysis. Moreover, we addressed the issue related to common method variance using full collinearity estimates (Kock & Lynn, 2012). The result presented in Table 1 indicates that the VIF values for measured variables are all below 3.3. Thus, confirming that this data set is free from common method variance.

Table 1:

Full collinearity estimates for the study

Constructs	EFC	EFV	SAT	SE	SInt
VIF	2.406	2.864	1.908	2.145	1.956

Note: EFC - Efficiency; EFV- Effectiveness; SAT-Satisfaction; SE – Student Engagement; SInt – Student Interactions

4.3. Methods of Data Analysis

SmartPLS 3 had been to test the reliability, validity and hypotheses using the two assessment approaches and the hypotheses were tested using the bootstrapping procedure; and it confirmed that all hypotheses were accepted as proposed by Hair et al. (2014).

4.4. Assessment of the Measurement Model

This study used a higher-order construct model design and it consists of reflective-formative constructs. The first-order constructs were assessed using a reflective model and the second-order constructs were measured using the formative model. Data were analysed using the embedded two-stage approach as proposed by Sarstedt et al. (2019) for the assessment of the measurement and structural models. There are two constructs for this study had the lower order components, namely Student Interactions and Student Engagement. Student Interactions' lower-order components are Student-Content, Student-Instructor, and Student-Student. Meanwhile, Student Engagement was formed by Emotional, Participation and Skill. In stage two, these scores were measured by the higher-order construct for the model (Student Interactions and Student Engagement), and other contracts were measured using their standard multi-item measures.

Table 2 exhibits the first-order reflective constructs that consist of Satisfaction, Efficiency, and Effectiveness. The item loadings for all reflective constructs are above 0.70 as suggested by Hair et al. (2019). The composite reliability for all constructs is above 0.80 and the value for AVE is reported to be above 0.50, indicating that all reflective constructs are valid for further analysis.

Table 2:

Assessment results of the measurement model (first-order construct - reflective)

Constructs	Items	Loading	CR	AVE
Satisfaction	B11	0.766	0.888	0.615
	B12	0.856		
	B13	0.821		
	B14	0.715		
	B15	0.756		
Efficiency	B21	0.785	0.912	0.722
	B22	0.866		
	B23	0.882		
	B24	0.863		
Effectiveness	B31	0.814	0.921	0.745
	B32	0.869		
	B33	0.884		
	B34	0.883		

On the contrary, the components of the convergent validity for the second-order formative constructs are reflected by the indicator of collinearity (VIF), statistical significance, and the weights of the dimensions (Hair et al., 2019; Xu, Peng & Prybutok, 2019). For this study, each of the two constructs namely Student Engagement and Student Interactions was formed by three dimensions. Student Engagement consists of Emotional, Participation and Skill. Meanwhile, Student Interactions consist of Student-Content, Student-Instructor and Student-Student dimensions. Table 3 shows that the VIF values

for all dimensions are below 3.3, the paths are statistically significant and weight indicators are between -1 and +1. These conditions confirmed that the formative model achieves its convergence validity, thus valid for further analysis.

Table 3:

Assessment results of the measurement model (second-order construct - formative)

Construct	Dimensions	Beta	p-value	VIF
Student Interactions	Student-Content	0.349	23.358***	1.818
	Student-Instructor	0.375	28.614***	2.135
	Student-Student	0.420	29.570***	2.195
Student Engagement	Emotional	0.392	21.181***	2.625
	Participation	0.378	26.653***	3.184
	Skill	0.330	27.622***	2.739

The discriminant validity for this model was measured using heterotrait-monotrait (HTMT) ratio, and the cut off indicator value is 0.85 for construct that are conceptually distinct; while the indicator 0.90 is applied to constructs of similar concepts (Henseler, Ringle & Sarstedt, 2014; Hair et al., 2019). In Table 4, only one HTMT indicator between Efficiency and Effectiveness is reported at 0.859, the rest of the indicators for both groups are below 0.85. The constructs for Efficiency and Efficiency represent a similar concept of constructs in the learning outcome (Drysdale et al., 2013), therefore the indicator of 0.90 can be applied. Thus, the HTMT indicators achieve its discriminant validity and valid for further analysis.

Table 4:

Discriminant validity using HTMT

Constructs	1	2	3	4	5
1. Effectiveness					
2. Efficiency	0.859				
3. Satisfaction	0.617	0.683			
4. Student Engagement	0.523	0.609	0.688		
5. Student Interactions	0.654	0.728	0.697	0.802	

Figure 2 shows the measurement model using stage embedded approach for the research framework. Student Engagement and Student Interactions consist of three dimensions each. All dimensions have been saved as a score to represent the construct. Student Engagement is represented by Emotional, Participation and Skill. Meanwhile, Student Interactions is represented by Student-Content, Student-Instructor, and Student-Student. Other constructs – Satisfaction, Efficiency, and Effectiveness maintain their standard multi-items. This figure also presents the R2 value, which is represented by the value inside the circles (constructs). By using this approach, the model has achieved its parsimony without losing the rigorousness of the information.

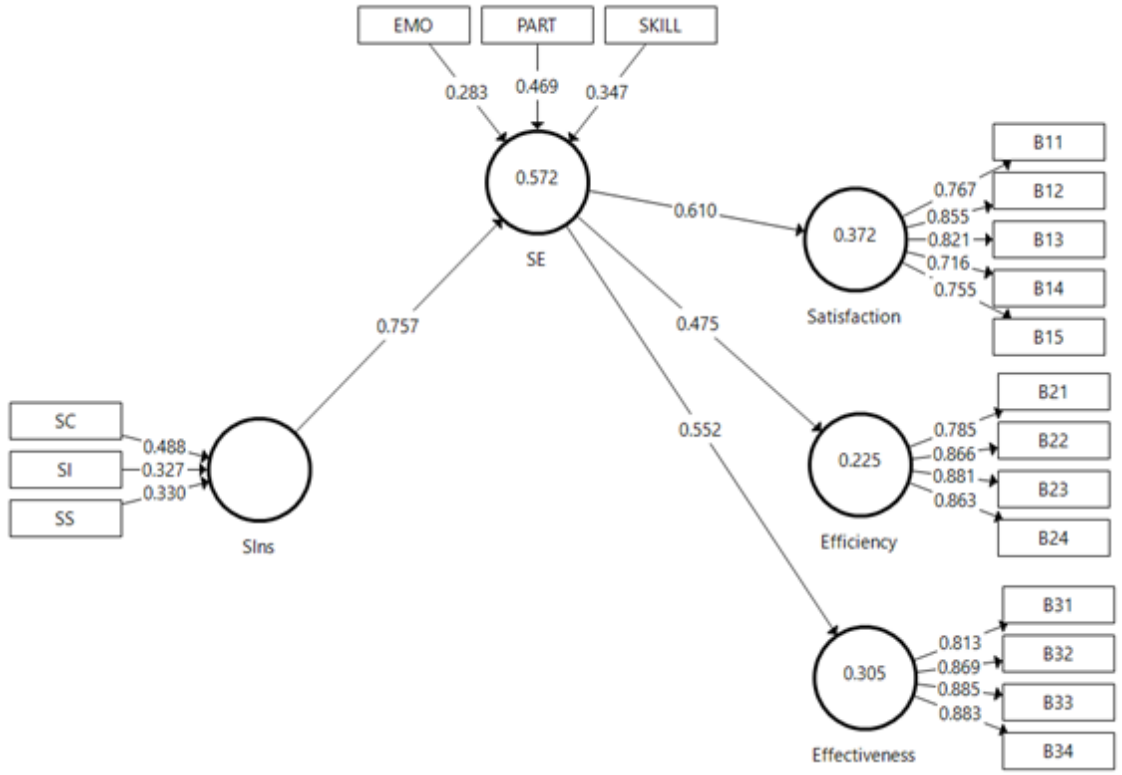

Figure 2: *Measurement model using two-stage approach*

Note: SE – Student Engagement; EMO – Emotional; PART – Participation; Sins – Student Interactions; SC – Student-Content; SI – Student Instructor; SS – Student Student

4.5. Assessment of the Structural Model

Once the model passed its assessment of the measurement test, we assessed the structural model for hypotheses testing. We started with the antecedent for Student Engagement. Student Interactions (β =0.757, $p < 0.001$) was also positively related to Student Engagement explaining 57.2 % of the variance in Student Engagement. Moreover, Student Engagement (β =0.610, $p < 0.001$) was also positively related to Satisfaction explaining 37.2 % of the variance in Satisfaction. Also, Student Engagement (β =0.552, $p < 0.001$) was also positively related to Satisfaction explaining 30.5 % of the variance in Efficiency. Finally, Student Engagement (β =0.475, $p < 0.001$) was also positively related to Satisfaction explaining 22.5 % of the variance in Effectiveness. Hence, it can be concluded that hypotheses H1, H2, H3 and H4 are supported. The result also reported that all the R2 values for endogenous variables are above 0.33, indicating that the inner path for the model is moderate (Chin, 1998; Henseler, Ringle & Sinkovics, 2009). See Table 5 for the direct path hypotheses results.

Table 5:

Results of hypothesis testing (direct path)

Hypo	Relationship	Std Beta	Std Error	t-value	p-value	BC LL 5%	BC UL 95%	R^2	f^2
H1	SIs -> SE	0.757	23.748	p<0.001	0.702	0.702	0.803	0.572	0.757
H2	SE -> SAT	0.610	13.844	p<0.001	0.527	0.527	0.670	0.372	0.610
H3	SE -> EFC	0.552	11.288	p<0.001	0.456	0.456	0.626	0.305	0.552
H4	SE -> EFV	0.475	8.755	p<0.001	0.368	0.368	0.551	0.225	0.475

Note: SE – Student Engagement; EMO – Emotional; PART – Participation; SIns – Student Interactions; SC – Student-Content; SI – Student Instructor; SS – Student

Table 6 exhibits the hypotheses result for the indirect path. Student Engagement has been positioned as the mediator for the model. Student Engagement (β =0.475, $p < 0.001$) mediated the relationship between Student Interactions and Satisfaction. Similarly, Student Engagement (β =0.418, $p < 0.001$) mediated the relationship between Student Interactions and Efficiency. Lastly, Student Engagement (β =0.359, $p < 0.001$) mediated the relationship between Student Interactions and Effectiveness. Hence, all indirect hypotheses (H5, H6, H7) are supported.

Table 6:

Results of hypothesis testing (mediating analysis)

Hypo	Relationship	Std Beta	Std Error	t-value	p-value	BC LL 2.5%	BC UL 97.5%
H5	SIs>SE>SAT	0.461	10.978	p<0.001	10.978	0.375	0.536
H6	SIs>SE>EFC	0.418	9.575	p<0.001	9.575	0.315	0.491
H7	SIs>SE>EFV	0.359	7.660	p<0.001	7.660	0.260	0.440

Note: SE – Student Engagement; EMO – Emotional; PART – Participation; Sins – Student Interactions; SC – Student-Content; SI – Student Instructor; SS – Student

5.0 DISCUSSIONS

This study tested five constructs namely Satisfaction, Efficiency, Effectiveness, Student Engagement, and Student Interactions. There were four direct paths tested and three indirect paths tested to achieve the research objectives.

This study found that Students Interactions have a positive influence on Student Engagement for the ENT300 subject. Students accessed the contents regularly and participated in online activities accordingly. Moreover, students interact with instructors more actively as compared to the traditional classes especially through WhatsApp group and Facebook group. Students also interact with their classmates to confirm on non-pedagogical matters such as the submission dateline without the presence of the instructors. This result confirms that high interactions in the classroom influence engagement among students (Poysa et al., 2018). Additionally, teachers' support increases the confidence level of the students to interact more in online activities, hence improving their engagement (Havik & Westergård, 2019).

This study also presents that Student Engagement has a positive influence on student performance variables (Satisfaction, Efficiency, and Effectiveness). Students who are engaged in their learning showed higher satisfaction with their learning activities because of their affection towards the task given. Students showed their confidence in presenting their assessments, both in the verbal as well as in the written forms because they understand the requirement of their assignment. Since the major part of the assessments is the preparation of the business plan through collaboration with other students in a group, social network is an important medium in supporting their learning beyond formal learning environments. Similarly, previous studies found learning engagement to have a positive influence on achieving learning goals (Ally, 2005; Anderson, 2005). With the inclusion of social networks, students seem to understand better about the content they learned, even though the concepts are classified as complex (Sakr, 2019), hence improving the performance of the students.

Finally, the results of this study also revealed that Student Engagement mediates the relationship between Student Interactions and student performance. It was found technology mediated learning has a positive influence on the performance of the students. They engaged in the discussion using social network comfortably with their peers and instructors. The supports and information gained through informal applications improve their efficacy in completing the assignment, as well as acquiring new skills along the line while preparing the assignment. Therefore, it can be concluded that Student engagement in a technology mediated learning environment can mediate the relationship between Student Interactions and Student Performance. This result answers the suggestion made by earlier scholars who posit the presence of engagement as the mediator to influence performance in the context of the technology mediated learning environment (Halverson & Graham, 2019).

6.0 CONCLUSIONS AND RECOMMENDATIONS

This study contributes to the literature on the development of Social Leaning Theory: Group, Nets, Sets by Dron and Anderson (2014). This theory explains engagement and interactions among various parties to assist in teaching and learning activities among entrepreneurship education students in in the context of entrepreneurship education in UiTM Perlis. Moreover, this study offers significant variables and research frameworks for technology mediated learning, particularly in the context of entrepreneurship education subject. Finally, the results confirm that Student Interactions and Student Engagement are important factors in influencing student performance namely Satisfaction, Efficiency and Effectiveness in the context of technology mediated learning. This study further explains that engagement has an important role in mediating Student Interactions and student performance. The presence of engagement improves student's participation, emotion, and skill in the learning activities in the ENT300 class. The implementation of technology mediated learning using social applications to support formal learning has a huge potential to facilitate learning when the universities close unexpectedly. It is suggested that future studies should examine the framework of this study involving a sample that is not only larger but involves several educational institutions. In addition, the criterion variable should also include other objective variables such as academic achievement measured based on grade point average. Continuous research is needed to find ways and methods to improve the effectiveness of the learning process. Younger generation who go through the learning process has the right for an effective and quality learning process.

7.0 CO-AUTHOR CONTRIBUTION

The authors affirmed that there is no conflict of interest in this article. Author1 carried out the fieldwork, prepared the literature review, carried out the statistical analysis and interpretation of the results. and overlook the writeup of the whole article. Author2 wrote the research methodology and did the data entry.

8.0 ACKNOWLEDGEMENTS

No acknowledgement.

9.0 REFERENCES

Albloy, A. M., & Mohamed, W. M. (2019). Perceptions And Attitudes of Saudi Arabia University Students Towards Using WhatsApp As Students-teachers Interactive Tool. Advances in Social Sciences Research Journal –, 6(11), 93–109.

Allen, E., & Seaman, J. (2011). Going the distance: Online Education in the United States, 2011. In Workforce. http://www.onlinelearningsurvey.com/highered.html

Ally, M. (2005). Foundations of educational theory for online learning. In T. Anderson & F. Elloumi (Eds.), Theory and practice of online learning (pp. 3–31). Athabasca University.

Anderson, T. (2005). Toward a Theory of Onlie Learning. In T. Anderson & F. Elloumi (Eds.), Theory and practice of online learning (Issue 1997, pp. 33–60). Athabasca University.

Anderson, T. (2016). Theories for Learning with Emerging Technologies. In Emergence and Innovation in Digital Learning (pp. 35–50). https://doi.org/10.15215/aupress/9781771991490.01

Anthony, B., Kamaludin, A., Romli, A., Raffei, A. F. M., Nincarean A/L Eh Phon, D., Abdullah, A., Ming, G. L., Shukor, N. A., Nordin, M. S., & Baba, S. (2019). Exploring the role of blended learning for teaching and learning effectiveness in institutions of higher learning: An empirical investigation. Education and Information Technologies, 24(6), 3433–3466. https://doi.org/10.1007/s10639-019-09941-z

Anthonysamy, L., Koo, A. C., & Hew, S. H. (2020). Self-regulated learning strategies and non-academic outcomes in higher education blended learning environments: A one decade review. Education and Information Technologies. https://doi.org/10.1007/s10639-020-10134-2

Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C. a., Tamim, R. M., Surkes, M. a., & Bethel, E. C. (2009). A Meta-Analysis of Three Types of Interaction Treatments in Distance Education. Review of Educational Research, 79(3), 1243–1289. https://doi.org/10.3102/0034654309333844

Broadbent, J. (2017). Comparing online and blended learner's self-regulated learning strategies and academic performance. Internet and Higher Education, 33, 24–32. https://doi.org/10.1016/j.iheduc.2017.01.004

Cain, M. K., & Zhang, Z. (2016). Univariate and multivariate skewness and kurtosis for measuring nonnormality : Prevalence , influence and estimation. Behavior Research Methods. https://doi.org/10.3758/s13428-016-0814-1

Chin, W. W. (1998). The Partial Least Squares Approach to Structural Equation Modeling. In G. A. Marcoulides (Ed.), Modern Methods for Business Research. Lawrence Erlbaum Associates.

Chong, Y., & Soo, H. S. (2021). Evaluation of first-year university students ' engagement to enhance student vevelopment. Asian Journal of University Education, 17(2), 113–121.

Coleman, E., & Connor, E. O. (2019). The role of WhatsApp ® in medical education ; a scoping review and instructional design model. BMC Medical Education, 8.

Dixson, M. D. (2010). Creating effective student engagement in online courses : What do students find engaging ? Journal of the Scholarship of Teaching and Learning, 10(2), 1–13.

Drysdale, J. S., Graham, C. R., Spring, K. J., & Halverson, L. R. (2013). An analysis of research trends in dissertations and theses studying blended learning. The Internet and Higher Education, 17, 90–100. https://doi.org/10.1016/j.iheduc.2012.11.003

Finstad, K. (2010). Interacting with Computers The Usability Metric for User Experience. Interacting with Computers, 22(5), 323–327. https://doi.org/10.1016/j.intcom.2010.04.004

Fook, C. Y., Narasuman, S., Aziz, N. A., Mustafa, S. M. S., & Han, C. T. (2021). Smartphone usage among university students. Asian Journal of University Education, 17(1), 283–291. https://doi.org/10.24191/ajue.v17i1.12622

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). A primer on partial least squares structural equation modeling (PLS-SEM). SAGE. https://doi.org/10.1108/EBR-10-2013-0128

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Halverson, L. R., & Graham, C. R. (2019). Learner Engagement in Blended Learning Environments: A Conceptual Framework. Online Learning, 23(2), 145–178. https://doi.org/10.24059/olj.v23i2.1481

Halverson, L. R., Graham, C. R., Spring, K. J., Drysdale, J. S., & Henrie, C. R. (2014). A thematic analysis of the most highly cited scholarship in the first decade of blended learning research. The Internet and Higher Education, 20, 20–34. https://doi.org/10.1016/j.iheduc.2013.09.004

Hassan, A., Anwar, I., Saleem, I., Islam, K. M. B., & Hussain, S. A. (2021). Individual entrepreneurial orientation, entrepreneurship education and entrepreneurial intention: The mediating role of entrepreneurial motivations. Asian Journal of University Education, 17(2), 236–251. https://doi.org/10.1177/09504222211007051

Havik, T., & Westergård, E. (2019). Do Teachers Matter ? Students ' Perceptions of Classroom Interactions and Student Engagement Do Teachers Matter ? Students ' Perceptions of Classroom. Scandinavian Journal of Educational Research, 0(0), 1–20. https://doi.org/10.1080/00313831.2019.1577754

Henseler, J., Ringle, C. M., & Sarstedt, M. (2014). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115–135. https://doi.org/10.1007/s11747-014-0403-8

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. Advances in International Marketing, 20, 277–319. https://doi.org/10.1108/S1474-7979(2009)0000020014

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 Some, 13(7), 546–580. https://doi.org/10.1016/s0193-953x(18)30902-x

Kratochvil, J. (2014). Efficiency of e-learning in an information literacy course for medical students at the Masaryk University. The Electronic Library, 32(3), 322–340. https://doi.org/10.1108/EL-07-2012-0087

Krejcie, R. V, & Morgan, D. W. (1970). Determining sample size for research activities. Educational and Psychological Measurement, 30, 607–610.

Kuo, Y.-C., Walker, A. E., Schroder, K. E. E., & Belland, B. R. (2014). Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. The Internet and Higher Education, 20, 35–50. https://doi.org/10.1016/j.iheduc.2013.10.001

Lin, H. M., Lee, M. H., Liang, J. C., Chang, H. Y., Huang, P., & Tsai, C. C. (2019). A review of using partial least square structural equation modeling in e-learning research. British Journal of Educational Technology, 0(0), 1–19. https://doi.org/10.1111/bjet.12890

Nasirun, N., Noor, S. M., Yusoff, R. Z., & Othman, A. A. (2015). A Comparison Between Web Enhancer Learners and Blended Learners in Flipped Classroom : A Quasi-Experimental Approach. International Academic Research Journal of Business and Technology, 1(2), 100–107.

Noesgaard, S. S., & Ørngreen, R. (2015). The effectiveness of e-learning: An explorative and integrative review of the definitions, methodologies and factors that promote e-Learning effectiveness. Electronic Journal of E-Learning, 13(4), 278–290.

Noraini, N., Noor, S. M., Yusoff, R. Z., & Othman, A. A. (2017). Student engagement, student interactions and student satisfaction in blended leaning: A case of entrepreneurship education. Advanced Science Letters, 23(8), 7952–7955. https://doi.org/10.1166/asl.2017.9617

Overbaugh, R. C., & Nickel, C. E. (2011). A comparison of student satisfaction and value of academic community between blended and online sections of a university-level educational foundations course. The Internet and Higher Education, 14(3), 164–174. https://doi.org/10.1016/j.iheduc.2010.12.001

Povera, A., & Babulai, V. (2019). School close immediatedly if API reach very unhealthy level. The New Straits Times.

Poysa, S., Vasalampi, K., Muotka, J., Lerkkanen, M.-K., Poikkeus, A., & Nurmi, J. (2018). Teacher – student interaction and lower secondary school students ' situational engagement. British Journal of Educational Psychology, 1–19. https://doi.org/10.1111/bjep.12244

Raes, A., Detienne, L., Windey, I., & Depaepe, F. (2019). A systematic literature review on synchronous hybrid learning : gaps identified. Learning Environments Research, 1–22. https://doi.org/10.1007/s10984-019-09303-z

Ratten, V., & Usmanij, P. (2020). Entrepreneurship education: Time for a change in research direction? International Journal of Management Education, In Press. https://doi.org/10.1016/j.ijme.2020.100367

Renner, D., Laumer, S., & Weitzel, T. (2014). Effectiveness and Efficiency of Blended Learning – A Literature Review. Americas Conference on Information Systems, Savannah, 2014, 1–13.

Sakr, M. (2019). 'It just opened my eyes a bit more': student engagement with Instagram to develop understanding of complex concepts. Teaching in Higher Education, 0(0), 1–14. https://doi.org/10.1080/13562517.2019.1613356

Sarstedt, M., Hair, J. F., Cheah, J. H., Becker, J. M., & Ringle, C. M. (2019). How to specify, estimate, and validate higher-order constructs in PLS-SEM. Australasian Marketing Journal, 27(3), 197–211. https://doi.org/10.1016/j.ausmj.2019.05.003

So, H.-J., & Brush, T. a. (2008). Student perceptions of collaborative learning, social presence and satisfaction in a blended learning environment: Relationships and critical factors. Computers & Education, 51(1), 318–336. https://doi.org/10.1016/j.compedu.2007.05.009

Sousa, M. J., Carmo, M., Gonçalves, A. C., Cruz, R., & Martins, J. M. (2019). Creating knowledge and entrepreneurial capacity for HE students with digital education methodologies: Differences in the perceptions of students and entrepreneurs. Journal of Business Research, 94 (February 2018), 227–240. https://doi.org/10.1016/j.jbusres.2018.02.005

Talaei-khoei, A., & Daniel, J. (2020). Can Facebook Improve Students ' Engagement in Flipped Classes ? Community of Inquiry Approach 2 . Students ' Engagement : Community of Inquiry (COI). 53rd Hawaii International Conference on System Sciences, 3, 3–11.

The Star. (2019). Online lessons for students if haze keeps schools closed , says Education Ministry. The Star.

Vo, H. M., Zhu, C., & Diep, N. A. (2017). The effect of blended learning on student performance at course-level in higher education: A meta-analysis. Studies in Educational Evaluation, 53, 17–28. https://doi.org/10.1016/j.stueduc.2017.01.002

Wu, J.-H., Tennyson, R. D., & Hsia, T.-L. (2010). A study of student satisfaction in a blended e-learning system environment. Computers & Education, 55(1), 155–164. https://doi.org/10.1016/j.compedu.2009.12.012

Xu, L., Peng, X., & Prybutok, V. (2019). Formative measurements in operations management research: Using partial least squares. Quality Management Journal, 26(1), 18–31. https://doi.org/10.1080/10686967.2018.1542287