Action research to reassess the acceptance and use of technology in a blended learning approach amongst postgraduate business students

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Abstract

Although the pedagogy of blended learning in higher education has been well-accepted since 2000, its dimension has been changing, mainly due to the incessant technological innovations. The impact recorded on students' experience has been reliant on various factors. Some of these factors are cultural diversity, technical abilities, level of organisational support, language difficulties, educational background, learning environment, and instructional design, among others. In this study, the acceptance and use of technology by international MBA students have been reassessed in the blended learning environment. The motivation for the selection of the cohort of international MBA students as a sample was to enable the inclusion of diversity as one of the focal points of the study. A two-cycle model of action research was adopted to reassess the use of technology and compare the attainment of learning outcomes between the blended and traditional learning approaches. Moreover, multiple regressions were employed using the unified theory of acceptance and use of technology (UTAUT) to test the significance of each variable collected from the survey on the students' learning experience and engagement. Our results have suggested that students' engagement is determined by positive learning experience without any bias toward traditional or blended learning approach. Students' age group was found to be relevant in the determination of behavioural intention, social influence, effort expectancy, performance expectancy and facilitating conditions towards the effective use of technology and blended learning. Students' gender was an irrelevant factor in the success of a blended learning approach.

Keywords: Action research; Blended learning; Unified theory of acceptance and use of technology; Triangular model; Traditional learning; Students' engagement; Learning experience.

1. Introduction

Students' learning experience has continued to be an important yardstick for measuring the success of teaching and learning activities in higher education. In the United Kingdom, the teaching excellence framework (TEF) has recently been established to assess the higher education providers' commitment to ensuring positive students' learning experience in universities and colleges (Office for Students (OFS), 2018). The key parameters of success identified in the framework are teaching quality, learning environment, students' outcomes and learning gain. The role of teachers or instructors is indispensable in the TEF key parameters of success in the quality of teaching. For example, Kangas et al. (2017) stressed that teachers are expected to adopt various teaching methods and utilize novel learning environments with technologies to ensure a positive learning experience among students. Scholars such as Davis and Davis (1990), Kerwin (1981) and Lam & Wong (1974) have also suggested that learning satisfaction is influenced by factors such as teacher's teaching skills, contents of delivery in teaching, individual characteristics, and students' participation. Verkuyten and Thijs (2002) have added that conducive academic and social climates in the class are responsible for the positive experience on students' satisfaction with learning. In the view of Fischer et al. (2018), a positive learning experience depends on the ability of teachers to align their teaching styles to a new or evolving educational landscape. From a wider perspective, Hicks et al. (2001) highlighted that the increasing demand for higher educational institutions to cater for the need of larger and more diverse cohorts was the leading cause of the rapid evolvement in educational practice (see also Fry et al. (2008) and McKenzie et al. (2013)). This has also led to the advent of new pedagogies in the teaching profession.

To find the most effective teaching and learning approach for achieving optimal student satisfaction and learning outcomes, researchers and practitioners in higher education have tested many pedagogical concepts. Among these are the blended learning approach (Finlay et al., 2022; Garrison and Kanuka, 2004; Picciano, 2009; Khodeir, 2018; Kaur, 2013; Boelens et al., 2018), virtual or online learning approach (Bozkurt and Sharma, 2020; Murphy, 2020), flipped learning approach (Awidi and Paynter, 2019; Kolb and Kolb, 2005; Hafidi and Mahnane, 2018; Cavanagh, 2011; Soliman, 2016; Lin, 2018; Lombardini et al., 2018), traditional learning approach

(Byers et al., 2018; Tortorella and Cauchick-Miguel, 2018; Clayton et al., 2018), playful learning approach (Kangas et al., 2017; Resnick, 2006; Hyvönen and Marjaana, 2005). Although many studies have been conducted on teaching pedagogies, scholars such as Khodeir (2018) have recommended for further research to examine their impact on students' satisfaction.

The purpose of this action research is to reassess the acceptance and use of technology in a blended learning approach during the most exciting times of technological innovations. The results will be compared with those attained by adopting a traditional learning approach to the same sample. The study's novelty lies in the methodology of two-cycle action research adopted to assess the two learning approaches at different times among the cohorts under investigation. The methodology includes using the technology acceptance model in evaluating the effectiveness of the blended learning approach.

2. Review of literature

Blended learning approach has been increasingly adopted in higher education institutions because of its flexibility (Prasad et al., 2018). It involves both face-to-face and online teaching techniques that empower the teacher or instructor to be flexible in adopting the two approaches based on the learning needs of the students (Partridge et al., 2011). The approach has been described by Garrison and Kanuka (2004) as both simple and complex because it is seemingly an extension of the traditional face-to-face learning approach. The scholars have also argued that the inclusion of internet-based learning activities in the pedagogy of blended learning is considerably complex but not too advanced. The blended learning approach has been very successful in Western universities compared to other international higher education institutions (Prasad et al., 2018). This could be due to the differences in previous learning experiences that exist between Western and international students, which resulted in a digital inequality, as claimed by Prasad et al. (2018). The background of students in terms of their social, economic, and cultural disposition is responsible for digital inequality (Ignatow and Robinson, 2017). One of the reasons behind the success of blended learning in the Western World was the spread of the internet and technological advancement (Güzer and Caner, 2014). Since the influx of international

students for various programmes in the Western universities has been significant over the years (Haggis, 2003), the undoubtful success of blended learning has been subjected to further investigations by many researchers. For example, Boelens et al. (2018) have tested the effectiveness of various designs of blended learning in relation to the growing students' diversity in the Belgian higher education. A total of twenty instructors were included in their study. The instructors were encouraged to design and implement various strategies in blended learning to address the diversity of the students. Their findings reveal three different perceptions of the instructors on implementing the blended learning approach. The first class of instructors disregarded the special needs of students in the implementation of blended learning. They employed the commonly used strategies of blended learning without any transformation. In this situation, students' satisfaction may not be positive. The second class of instructors believed that increased support in the existing blended learning would reasonably address the special needs of students. The third class of instructors believed that blended learning should be completely designed in cognisance of the special learning needs of the students, and thus achieve the optimal students' satisfaction. These findings indicate that the success of a blended learning approach depends on the perception and attitude of instructors. Mieg (2009) and Smith and Strahan (2004) have also made the same conclusion.

Case study research studies have been conducted to examine the differences between blended and traditional learning by scholars such as Nazarenko (2015) and Byers et al. (2018). Nazarenko (2015) undertook case study research on university students to assess the impact of the two approaches on students' experience. The findings indicated improved students' professional and informational competencies with the blended learning approach. Khodeir (2018) and Byers et al. (2018) have gone to the extent of changing classroom layout to reflect traditional and blended approaches, respectively. The scholars have all discovered the importance of learning spaces in effective learning.

Scholars have also investigated learners' behavioural intentions towards the use of blended learning. They primarily examined the learners' behavioural intentions towards the use of technology. For example, Erjavec and Manfreda (2022) and Prasad et al. (2018) have adopted the unified theory of acceptance and use of technology

(UTAUT) model to examine the learners' behavioural intentions. The model was used to assess the importance of learners' social influence (behavioural intention), facilitating conditions (ease of use), and effort expectancy (attitude) towards the use of technology as the key to the successful implementation of blended learning pedagogy. Several scholars have similarly used technology acceptance models to assess the effectiveness of blended learning in higher education, considering the growing number of international students in Western universities and colleges. Some of these models are the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975), the theory of planned behaviour (TPB) (Ajzen, 1985) and the technology acceptance model (TAM) (Davis, 1989; Scherer et al., 2019). Results were mixed. However, the crucial findings are that the success stories of the blended learning approach were from studies on the learning satisfaction of local (European) students (Francis and Shannon, 2013; Johnson et al., 2016; Prasad et al., 2018). Bower et al. (2014) believed that changes are needed to the existing blended learning to include skilful integration of online and face-to-face teaching materials and ensure purposeful design to address the special needs of learners. Chang and Cheung (2001) have identified a challenge to blended learning due to the barriers to international students' full acceptance of technology (see also Kennedy et al., 2008). The mixed results and the failure to consider blended learning as a challenge-free pedagogy justify the need for this research.

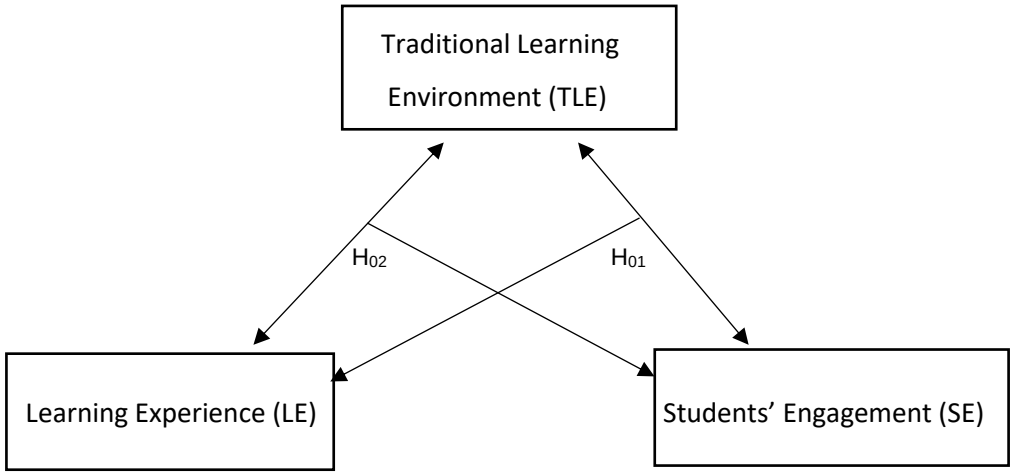
3. Theoretical framework and hypotheses development

The unified theory of acceptance and use of technology (UTAUT) has been formulated to assess user intentions towards the use of technology in learning by Venkatesh et al (2003). The model has been extensively validated by many scholars (for example, see Taylor and Todd (1995); Kennedy et al. (2008); Lin and Anol (2008). Amongst the key strengths of the model was the use of social factors to predict actual use. However, scholars such as Bagozzi (2007), Van Raaij et al. (2008) and Li (2020) have criticized the model for restricting the variables used in predicting behaviour.

Figures 1 and 2 below show the models adopted to assess students' satisfaction under both traditional and blended learning approach. Figure 1 tests the experience under traditional methods, while Figure 2 deals with the model to explore the blended

learning approach. The models are tested using the survey responses from the action research undertaken (see Appendix 1 and 2 for questionnaires administered).

Figure 1 Triangular model for traditional learning approach



*A triangular model was adopted to assess the causal relationship between traditional learning environment (TLE), students' engagement (SE) and learning experience (LE). A two-way relationship was formulated into two hypotheses. The first hypothesis (H_{01}) was to test whether TLE and SE (independent variables) are the determinants of LE (dependent variable). In the second hypothesis (H_{02}), TLE and LE (independent variables) were tested for significance in the determination of SE (dependent variable). In the two hypotheses tested, students' preference for learning environment was tested for significance in determining their positive learning experience and engagement (see Clayton et al. (2018)).

Figure 2 Unified theory of acceptance and use of technology (UTAUT) for blended learning approach

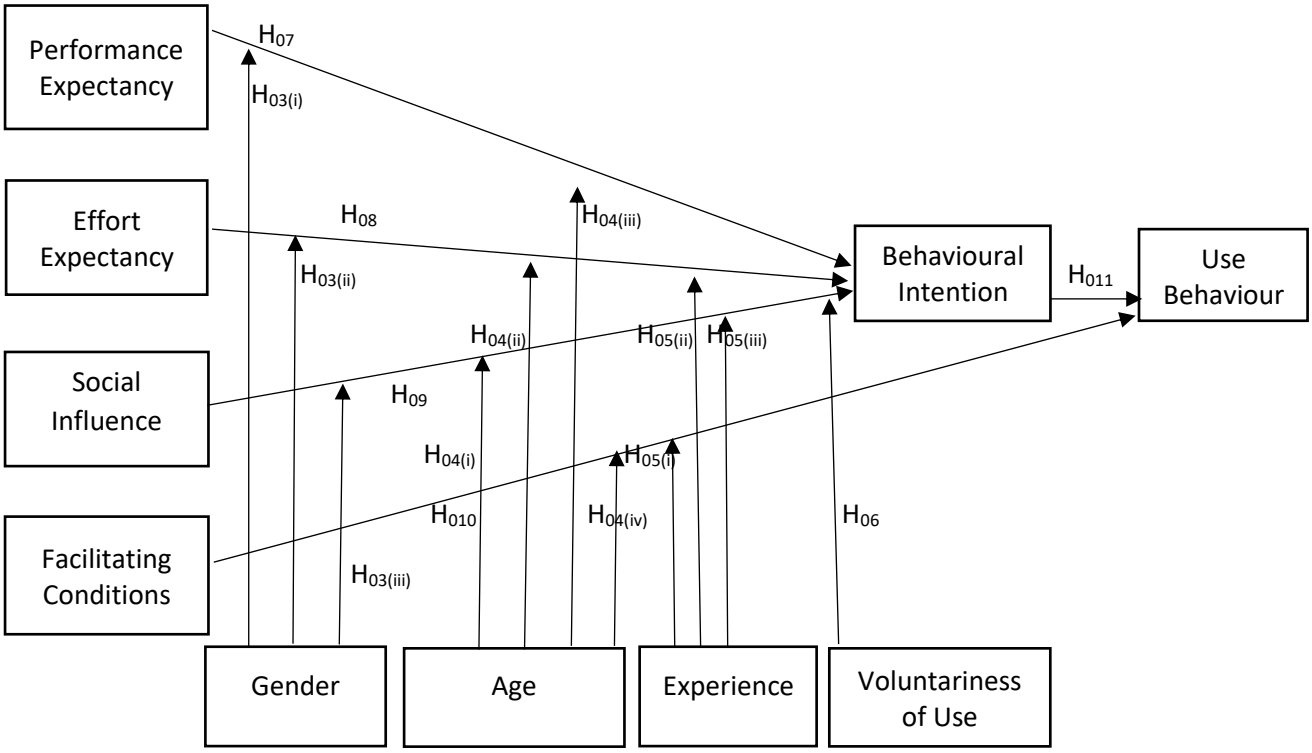


*Figure 2 presents the UTAUT model with numerous hypotheses. As indicated in the model, students' socio-demographic factors (independent variables) are tested for a causal relationship with the other UTAUT factors (performance expectancy, effort expectancy, social influence and facilitating conditions) in a blended learning environment towards the students' behavioural intention to use technology facilities for effective blended learning (Alkhowaiter, 2022; Venkatesh et al., 2003).

The summary of the research hypotheses to be tested are as follows:

H_{01} – Traditional learning environment and students' engagement are the determinants of a positive learning experience.

H_{02} – Traditional learning environment and learning experience are the determinants of desired students' engagement.

H_{03} – Students' gender determines their behavioural intention towards the effective use of technology and the blended learning approach.

> **$H_{03\ (i)}$ –** Students' gender determines the performance expectancy towards the effective use of technology and blended learning.
>
> **$H_{03\ (ii)}$ –** Students' gender determines effort expectancy towards using technology and blended learning effectively.
>
> **$H_{03\ (iii)}$ –** Students' gender determines social influence towards the effective use of technology and blended learning.

H_{04} – Students' age determines their behavioural intention towards the effective use of technology and the blended learning approach.

> **$H_{04\ (i)}$ –** Students' age determines the effect of social influence towards effective use of technology and blended learning.
>
> **$H_{04\ (ii)}$ –** Students' age determines effort expectancy towards effective use of technology and blended learning.
>
> **$H_{04\ (iii)}$ –** Students' age determines performance expectancy towards effective use of technology and blended learning.
>
> **$H_{04\ (iv)}$ –** Students' age determines the perception of students on facilitating conditions for effective use of technology and blended learning.

H_{05} – Students' work experience determines their behavioural intention towards the effective use of technology and the blended learning approach.

> **$H_{05\ (i)}$ –** Students' work experience determines the perception of students on facilitating conditions for effective use of technology and blended learning.
>
> **$H_{05\ (ii)}$ –** Students' work experience determines effort expectancy towards using technology and blended learning effectively.
>
> **$H_{05\ (iii)}$ –** Students' work experience determines the effect of social influence towards effective use of technology and blended learning.

H_{06} – Students' voluntariness of use (proxied by students' preference) determines the effect of social influence on their behavioural intention towards using technology and blended learning effectively.

H_{07} – Students' performance expectancy determines their behavioural intention towards using technology and blended learning effectively.

> **$H_{07\ (i)}$ –** Students' performance expectancy determines their behavioural intention to continue using IT resources and facilities to support their learning process.
>
> **$H_{07\ (ii)}$ –** Students' performance expectancy determines the behavioural intention of students to engage with any invention in IT to enhance their learning experience.
>
> **$H_{07\ (iii)}$ –** Students' performance expectancy determines the behaviour of students that does not envisage limited use of IT in learning activities.
>
> **$H_{07\ (iv)}$ –** Students' performance expectancy determines the expectation of students to achieve their learning objectives without IT or any online resources.

H_{08} – Students' effort expectancy determines their behavioural intention towards using technology and blended learning effectively.

> **$H_{08\ (i)}$ –** Students' effort expectancy determines their behavioural intention to continue using IT resources and facilities to support their learning process.
>
> **$H_{08\ (ii)}$ –** Students' effort expectancy determines the behavioural intention of students to engage with any invention in IT to enhance their learning experience.
>
> **$H_{08\ (iii)}$ –** Students' effort expectancy determines the behaviour of students that does not envisage limited use of IT in learning activities.
>
> **$H_{08\ (iv)}$ –** Students' effort expectancy determines the expectation of students to achieve their learning objectives without IT or any online resources.

H_{09} – Students' social influence determines their behavioural intention towards using technology and blended learning effectively.

> **$H_{09\ (i)}$ –** Students' social influence determines their behavioural intention to continue using IT resources and facilities to support their learning process.
>
> **$H_{09\ (ii)}$ –** Students' social influence determines the behavioural intention of students to engage with any invention in IT to enhance their learning experience.
>
> **$H_{09\ (iii)}$ –** Students' social influence determines the behaviour of students that does not envisage limited use of IT in learning activities.
>
> **$H_{09\ (iv)}$ –** Students' social influence determines the expectation of students to achieve their learning objectives without IT or any online resources.

H_{010} – Facilitating conditions determine the students' use of technology behaviour towards effective blended learning.

H_{011} – Students' behavioural intention determines their end-use of technology behaviour towards effective blended learning.

H_{012} – The state of the learning environment dictates the success of the blended learning approach in the higher education sector.

H_{013} – The quality of instructional design is a key to achieving positive students' experience through a blended learning approach.

4. Research method

4.1 Action research

A two-cycle model of action research was adopted, as in Mertler and Charles (2008), to assess the use of technology and the effectiveness of a blended learning approach among international MBA students. According to Muir (2007), each of the two cycles of the action research will consist of actions of planning, executing, intervening, analysing, reflecting and findings. We intend to have an initial observation of the current situation before the commencement of the first cycle of the action research. Our reflection and findings from the first cycle will guide us in planning our activities for the second cycle.

4.2 Survey method

Questionnaires were administered among two different cohorts of students enrolled for an International MBA degree. Class sessions used for the action research were arranged to be undertaken separately using different learning approaches. The duration of the class sessions was planned to be seven hours each for teaching and learning activities based on traditional and blended learning approaches, respectively. A total of 84 surveys were completed, and two were excluded due to incomplete responses.

4.3 Data analysis

Data collected from the two cycles of the action research were analysed based on a survey research method. In the data analysis, descriptive statistics and multiple regressions were employed to test the significance of the variables collected, as in Prasad et al. (2018). The aim was to assess the postgraduate students' engagement with Information Technology platforms such as Moodle and Mahara using the unified theory of acceptance and use of technology (UTAUT) model (Venkatesh et al., 2003). The adoption of UTAUT was motivated by the intention to investigate the readiness and efforts of different cohorts of postgraduate students in adopting the systems of Moodle and Mahara in blended learning. A triangular model was also adopted to test students' satisfaction in a class session based on a traditional learning approach by using three key areas of the traditional learning environment (TLE), learning experience (LE) and students' engagement (SE). A two-way multiple regression analysis will be carried out to assess whether traditional learning environment (TLE) and students' engagement (SE) as independent variables can be responsible for a positive learning experience (LE) as a dependent variable. Similarly, TLE and LE will be used as independent variables and SE as a dependent variable. The extent of relationship between the three variables will equally be assessed.

5. Results and discussion of findings

5.1 Action research

The following results are from the two-cycle action research model (Muir, 2007; Mertler and Charles, 2008).

5.1.1 First cycle:

5.1.1.1 Plan

i. Teaching and learning activities were planned to be undertaken based on a traditional learning approach where information technology was limited or absent (Dovey and Fisher, 2014).

ii. Learning instructions were to be given to students in the class sessions. Students were expected to take notes on their notebooks instead of computers, laptops, mobile or any IT gadget (Byers et al., 2018).

iii. Assignments (in-class and homework) were to be given in the class, and students would be asked to bring back assignments in the following week for marking. The aim was to limit the adoption of wider pedagogies that facilitate technology-enhanced learning (Dumont and Istance, 2010).

iv. Classes were arranged based on the traditional classroom layout, with all students directly facing the board (Byers et al., 2018; Hidalgo-Cabrillana and Lopez-Mayan, 2018).

5.1.1.2 Action

i. The approach of teaching adopted by a lecturer was based on a traditional teaching style dominated by class instructions, including instructions on class exercises and other learning activities during the class session (Hidalgo-Cabrillana and Lopez-Mayan, 2018).

ii. Students were asked to limit the use of IT equipment and internet facilities during the class session. Although scholars such as Shute and Rahimi (2017) and Straub (2009) have strongly argued that incorporating the use of technology in teaching is a tool that facilitates learning, we decided to test the effectiveness of teaching without technology. Jeffrey and Craft (2004) have contrarily argued that the success of teaching depends on teachers' ability to identify students' learning abilities.

iii. A pedagogy based on traditional approach of teaching was implemented in the class session (Reynard, 2009).

iv. Students' engagement was observed during the class session. In the following week, questionnaires were also administered among the students

to assess their views on the traditional learning approach adopted in the past week.

5.1.1.3 Evaluation

i. Questionnaires were administered among 44 International MBA students (30 from Asia; 9 from Europe; 4 from Africa; 1 from North America) to evaluate their responses to the traditional learning approach adopted.

ii. A summary of their responses has shown that 70 per cent of the respondents agree that the learning environment was conducive to learning even without the use of any IT equipment. Out of the remaining respondents, 11.4 per cent were neutral and 13.6 per cent disagree with the statement.

iii. The learning experience was described as very positive by 54.5 per cent of the respondents, 31.8 per cent responded that it was just positive, and 13.6 per cent of the respondents stated that it was not positive.

iv. Students' engagement was also examined. From the responses, 88.7 per cent of the students believed that they had the opportunity to participate in the class discussion. Seven questions were asked to assess the extent of students' engagement in the class. In addition to the opportunity for participation, other areas covered in the assessment were an opportunity for academic and social interaction, student-teacher interaction, collaborative learning, the opportunity to learn from colleagues and a motivating delivery style (McCormick et al. 2013). In all cases, over 75 per cent of the students have responded positively about the key areas of students' engagement.

5.1.1.4 Reflection

i. The class session was observed to be successful with a positive level of student engagement and active teacher-student interactions. In the general comment section of the questionnaire, 43.2 per cent of the students described the traditional learning approach as particularly good.

ii. Due to the absence of technology in the session, the teaching effort demonstrated in the class was characterised by the teacher's innovation, control, and domination (Jeffrey and Craft, 2004). Students were only acting on given instructions.

iii. Unsurprisingly, more than 50 per cent of European students were unhappy with the use of traditional approach. A particular respondent from Europe commented that:

"The lecturer prevented students from using laptops to make notes. Not very nice for people with handwriting issues, dyslexia, etc".

Another respondent stated that:

"It was not very motivating as in this day and age, learning with technology is more interesting, and I can learn better with visuals".

iv. However, students from Asia and Africa were pleased with the traditional approach adopted. More than 60% of them commented positively about it. Some of these comments stated that:

"I love it better than IT/slides usage".
"I like that because it's kinda give me new experience".
"It was perfect and more practical".
"It was nice and engaging, free from distractions. I liked it".

v. The mixed responses have justified the implementation of the second cycle of the action research (Mertler and Charles, 2008).

5.1.1.5 Findings

i. Students were very engaged during the class session. There were no distractions from the use of phones or other IT gadgets.

ii. It was discovered that lecturers must put in more effort during the class session to ensure that all instructions are clear and understood by students. It was an absolute instructor-led training or session (Woodall, 2010). Previous studies show that students were more satisfied with the traditional learning approach if clear instructions were given (Chen and Jones, 2007).

iii. Most students from the European states seem to be dissatisfied with the session based on the traditional approach. The students' critical issue was the limited use of IT facilities in the session (Prasad et al., 2018).

iv. Most of the students from the African and Asian states were very satisfied with the traditional approach because of the absence of distraction from using personal phones or laptops. According to Ignatow and Robinson (2017), this was due to digital inequality caused by previous learning experiences which were different from that of local (European) students. The difference in learning experiences between the local and international students was explained to be due to the diverse social, economic, and cultural status (Myers and Klein, 2011).

5.1.2 Second cycle:

5.1.2.1 Plan

i. A blended learning approach was planned to be adopted in the following week after adopting the traditional learning approach. Students' feedback on the features of the blended learning approach will be collected from the administered questionnaires and analysed accordingly to appreciate the impact of the two learning approaches on students' experience (see also Nazarenko, 2015).

ii. Both online and classroom activities will be involved in the learning process. The method will also be designed to incorporate different modes of delivery, including the optimal use of resources to maximise the students' learning outcomes (Garrison, 2004; Graham, 2006).

iii. IT facilities will be fully utilised. Specifically, online learning platforms and software applications such as Moodle, Mahara, Excel and Socrative will be encouraged.

iv. Since the components of blended learning approach consist of three elements of learning environment, instructional activities, and use of media (Kaur, 2013), the learning environment will be made to reflect a conducive atmosphere that enhances optimum use of resources to attain instructional goals and learning objectives (Holden and Westfall, 2006). For this reason, the instructor will change the class arrangement to be in a ring-form with mini-groups of at least four students in each group to encourage collaboration and efficient use of resources among the students (Byers et al., 2018; Hidalgo-Cabrillana and Lopez-Mayan, 2018).

5.1.2.2 Action

i. Before the class sessions, instructions on learning activities were sent to students by email and placed on Moodle to encourage learning without the students having to be face-to-face with the lecturer (Kaur, 2013).

ii. Students were instructed to use laptops and phones during the class sessions. Most of the lecturer's instructions were by visual tools. It was the combination of various modes of delivery, including some of the traditional learning techniques. It involves direct lecturing, open discussions, self-learning by students, use of visual aids, Socrative application and other online platforms such as Moodle (Khodeir, 2018).

iii. Communication with students was based on both in-class and out-of-class feedback to ensure learning activities were undertaken irrespective of location (Khodeir, 2018).

iv. In the Socrative application, students were directed to download the software application on their laptops and phones. This is to provide answers to practice questions that were framed in line with the given learning objectives of the session (Guarascio et al., 2017). Group activities were also organised on the Socrative application, and students participated according to the mini groups formed based on their sitting arrangement.

v. Students were also instructed to explore the Microsoft Excel spreadsheet to provide answers to some of the practice questions formulated.

vi. Students were given a survey after the session to determine their preferences from the two different teaching approaches adopted and also assess the success or effectiveness of the blended learning approach.

5.1.2.3 Evaluation

i. A cohort survey was conducted among 38 International MBA students (26 from Asia; 6 from Europe; 5 from Africa; 1 from North America) to evaluate their responses on the effectiveness of the blended learning approach adopted.

ii. Students' digital learning abilities were assessed in the survey. According to the responses, 82.5 per cent of the students have basic computer capabilities, 80 per cent agreed they have above-average computer capabilities, and 57.5 per cent believed they are computer knowledge experts. A significant proportion of the students at 65 per cent have agreed that the level of computer knowledge directly influences their academic performance.

iii. It was observed that students are not confident in using Moodle or Mahara, as only 42.5 per cent agreed that they do not need the support of the

University's IT staff in using the online platforms. This result has been proven by the responses of only 40 per cent agreeing that they must use Moodle to pass their modules. Up to 32.5 per cent of the students have stated that they do not like using Moodle.

iv. The acceptability of the Socrative application among the students has also been assessed. The responses show that 82.5 per cent of the students agreed that the application was relatively easy to use. On the same note, 80 per cent of the students indicated that using the software application during class sessions was helpful.

v. The learning experience was described as positive by 85 per cent of the respondents compared to the 86.3 per cent recorded adopting the traditional learning approach.

vi. The responses have also shown that 85 per cent of the students believed they had the opportunity to participate in the class activities compared to the 88.7 per cent recorded on the adoption of the traditional learning approach. Up to 82.5 per cent of the students have agreed that there was an opportunity for academic and social interactions during class sessions. And 85 per cent indicated they were motivated by the delivery style adopted during the class session.

5.1.2.4 Reflection

i. Teachers' expertise plays a vital role in the success of any teaching-learning style adopted among international students (see also Mieg, 2009; Smith and Strahan, 2004).

ii. Students' learning experience can be positive depending on their learning abilities and the delivery style of instructors (see also Smith and Strahan, 2004).

iii. Digital inequality might not explain the gap in the usage of the internet and IT facilities between the students from the third world and developed countries, as suggested by many scholars such as Ignatow and Robinson (2017).

iv. Students across four continents of the seven continents of Asia, Africa, North and South America, Antarctica, Europe and Australia, as included in the survey, were all very satisfied with the blended approach. There were no students from South America, Antarctica, and Australia in the sample of students.

v. Some students from Asia and Africa have commented as follows:

"I will prefer blended learning".
"It's a good way of learning approach".
"I like the approach as this develops the basics ion the subject, and it develops the passion towards subject. After that, we can solve problems using any method".
"It was a good challenge which encouraged class participation".
"It was useful".

vi. A few students from Asia and Africa have indicated that their learning experience was better under the traditional learning approach. Some of the general comments they provided are shown below.

"There was much less interaction between tutor and student. Prefer the traditional method".

"Please leave more textbooks available in the library as it's always difficult to find the appropriate one for private study".

vii. Expectedly, European students were also very satisfied and quested for more of the blended approach. Some of their comments are:

“Use more Excel, isn’t it?”

“Mix it up”.

5.1.2.5 Findings

i. Students in higher education have different characteristics in terms of previous educational experiences, interests, expectations, and readiness for learning that determine the quality of their learning experiences (see also Fry et al., 2008; Tomlinson and Imbeau, 2013; Vasileva et al., 2015; Ra¨isa¨nen et al., 2016).

ii. Students were satisfied with the blended learning approach adopted irrespective of their countries of origin. This could be attributed to the integration of various teaching methods aimed at satisfying students’ needs, challenging them to attain learning outcomes in a conducive environment (see also Garrison and Kanuka, 2004; Picciano, 2009).

iii. Students were excited and engaged during the class session. The excitement could be because of the use of phones, laptops and learning software applications such Socrative. Another reason could be due to the age bracket of the survey respondents. Over 90 per cent of the respondents were in the age bracket of between 20 and 29 years. Banerjee and Duflo (2008) have argued that young people are more likely to be engaged with technology, although this has been contradicted by Van Dijk (2005). Chen and Jones (2007) believed that students in blended learning classes were satisfied because of the perceived improvement in their analytical skills.

5.2 Analysis of measurement models and hypotheses testing

The summary of the data collected is presented in Tables 1 and 2 below. The data was used in the analysis of the measurement models and hypotheses testing.

Table 1

Descriptive statistics of students' responses on the traditional learning approach

Measure	Items	Frequency	Percent (%)	Cumulative (%)
Gender	Males	28	63.6	63.6
	Females	16	36.4	100.0
Age	20-29 years	42	95.5	95.5
	30-39 years	2	4.5	100.0
Education	First degree	7	15.9	15.9
	Second degree	36	81.8	97.7
	Others	1	2.3	100.0
Experience	<1 year	19	43.2	43.2
	1-2 years	12	27.3	70.5
	3-5 years	9	20.5	90.9
	>5 years	4	9.1	100.0
Continent of origin	Asia	30	68.2	68.2
	Africa	4	9.1	77.3
	North America	1	2.3	79.5
	Europe	9	20.5	100.0
TLE - Conducive Learning Environment	Strongly disagree	4	9.1	9.1
	Disagree	2	4.5	13.6
	Neutral	5	11.4	25.0
	Agree	19	43.2	68.2
	Strongly agree	14	31.8	100.0
TLE - Achieved Learning Outcomes	Strongly disagree	1	2.3	2.3
	Disagree	3	6.8	9.1
	Neutral	4	9.1	18.2
	Agree	17	38.6	56.8
	Strongly agree	19	43.2	100.0
TLE – Effective Classroom Layout	Strongly disagree	1	2.3	2.3
	Neutral	6	13.6	15.9
	Agree	11	25.0	40.9
	Strongly agree	26	59.1	100.0
TLE – Satisfactory Module Arrangement	Strongly disagree	1	2.3	2.3
	Disagree	1	2.3	4.5
	Neutral	5	11.4	15.9
	Agree	15	34.1	50.0
	Strongly agree	22	50.0	100.0
LE – Positive Learning Experience	Disagree	3	6.8	6.8
	Neutral	3	6.8	13.6
	Agree	14	31.8	45.5
	Strongly agree	24	54.5	100.0
LE – Satisfactory Learning Approach	Strongly disagree	1	2.3	2.3
	Disagree	2	4.5	6.8
	Neutral	3	6.8	13.6
	Agree	16	36.4	50.0
	Strongly agree	22	50.0	100.0
LE – Effective Learning Approach	Strongly disagree	1	2.3	2.3
	Disagree	2	4.5	6.8
	Neutral	8	18.2	25.0
	Agree	10	22.7	47.7
	Strongly agree	23	52.3	100.0
LE – Intellectually Stimulating Module	Strongly disagree	2	4.5	4.5
	Neutral	5	11.4	15.9
	Agree	16	36.4	52.3
	Strongly agree	21	47.7	100.0
SE – Participatory Teaching Session	Strongly disagree	3	6.8	6.8
	Neutral	2	4.5	11.4
	Agree	19	43.2	54.5

	Strongly agree	20	45.5	100.0
SE – Presence of Academic and Social Interaction	Strongly disagree	2	4.5	4.5
	Neutral	4	9.1	13.6
	Agree	18	40.9	54.5
	Strongly agree	20	45.5	100.0
SE – Positive Learning Activities	Strongly disagree	1	2.3	2.3
	Disagree	1	2.3	4.5
	Neutral	5	11.4	15.9
	Agree	22	50.0	65.9
	Strongly agree	15	34.1	100.0
SE – Satisfactory Students-Teacher Interaction	Strongly disagree	2	4.5	4.5
	Neutral	2	4.5	9.1
	Agree	17	38.6	47.7
	Strongly agree	23	52.3	100.0
SE – Presence of Collaborative Learning	Strongly disagree	1	2.3	2.3
	Disagree	2	4.5	6.8
	Neutral	4	9.1	15.9
	Agree	18	40.9	56.8
	Strongly agree	19	43.2	100.0
SE – Opportunity to Learn from Colleagues	Strongly disagree	1	2.3	2.3
	Disagree	5	11.4	13.6
	Neutral	3	6.8	20.5
	Agree	24	54.5	75.0
	Strongly agree	11	25.0	100.0
SE – Delivery Style Motivates Participation	Strongly disagree	3	6.8	6.8
	Disagree	1	2.3	9.1
	Neutral	6	13.6	22.7
	Agree	16	36.4	59.1
	Strongly agree	18	40.9	100.0
General Comment	Negative	5	11.4	11.4
	Neutral	20	45.5	56.8
	Positive	19	43.2	100.0

*TLE = Traditional Learning Environment; LE = Learning Experience; SE = Students' Engagement;

Table 2

Descriptive statistics of students' responses on the blended learning approach

Measure	**Items**	**Frequency**	**Percent (%)**	**Cumulative (%)**
Gender	Males	25	65.8	65.8
	Females	13	34.2	100.0
Age	20-29 years	35	92.1	92.1
	30-39 years	3	7.9	100.0
Education	First degree	6	15.8	15.8
	Second degree	32	84.2	100.0
Experience	<1 year	13	34.2	34.2
	1-2 years	14	36.8	71.1
	3-5 years	10	26.3	97.4
	>5 years	1	2.6	100.0
Continent of origin	Asia	26	68.4	68.4
	Africa	5	13.2	81.6
	South America	1	2.6	84.2
	Europe	6	15.8	100.0
PE – Basic Computer Capabilities	Strongly disagree	1	2.6	2.6
	Disagree	3	7.9	10.5
	Neutral	1	2.6	13.2
	Agree	14	36.8	50.0
	Strongly agree	19	50.0	100.0
PE – Moderate Computer Capabilities	Disagree	2	5.3	5.3
	Neutral	4	10.5	15.8
	Agree	14	36.8	52.6
	Strongly agree	18	47.4	100.0
PE – Advanced Computer Capabilities	Disagree	5	13.2	13.2
	Neutral	10	26.3	39.5
	Agree	13	34.2	73.7
	Strongly agree	10	26.3	100.0
PE – IT Knowledge Dictates Academic Performance	Strongly disagree	1	2.6	2.6

	Disagree	5	13.2	15.8
	Neutral	6	15.8	31.6
	Agree	15	39.5	71.1
	Strongly agree	11	28.9	100.0
PE – Use of Moodle or Mahara without IT Help	Strongly disagree	4	10.5	10.5
	Disagree	7	18.4	28.9
	Neutral	10	26.3	55.3
	Agree	8	21.1	76.3
	Strongly agree	9	23.7	100.0
PE – Achieving Pass Mark without Moodle	Strongly disagree	12	31.6	31.6
	Disagree	4	10.5	42.1
	Neutral	14	36.8	78.9
	Agree	5	13.2	92.1
	Strongly agree	3	7.9	100.0
EE – Easy Access to Moodle in Learning Activities	Disagree	1	2.6	2.6
	Neutral	7	18.4	21.1
	Agree	15	39.5	60.5
	Strongly agree	15	39.5	100.0
EE – At least 3 Hours of Daily Internet Use	Disagree	1	2.6	2.6
	Neutral	6	15.8	18.4
	Agree	8	21.1	39.5
	Strongly agree	23	60.5	100.0
EE – More than 3 Hours of Daily Internet Use	Neutral	8	21.1	21.1
	Agree	10	26.3	47.4
	Strongly agree	20	52.6	100.0
EE – Daily Use of Moodle or Mahara	Strongly disagree	2	5.3	5.3
	Disagree	10	26.3	31.6
	Neutral	11	28.9	60.5
	Agree	5	13.2	73.7
	Strongly agree	10	26.3	100.0
EE – At least 3 Hours of Daily Use of Moodle	Strongly disagree	6	15.8	15.8
	Disagree	9	23.7	39.5
	Neutral	10	26.3	65.8
	Agree	6	15.8	81.6
	Strongly agree	7	18.4	100.0
EE – Dislike for the Use of Moodle or Mahara	Strongly disagree	12	31.6	31.6
	Disagree	6	15.8	47.4
	Neutral	7	18.4	65.8
	Agree	4	10.5	76.3
	Strongly agree	9	23.7	100.0
EE – Learning Interest to Use Moodle	Strongly disagree	8	21.1	21.1
	Disagree	7	18.4	39.5
	Neutral	9	23.7	63.2
	Agree	8	21.1	84.2
	Strongly agree	6	15.8	100.0
EE – Effective Use of Socrative Software Application	Neutral	5	13.2	13.2
	Agree	14	36.8	50.0
	Strongly agree	19	50.0	100.0
SI – Never Used Moodle in the Past	Strongly disagree	19	50.0	50.0
	Disagree	3	7.9	57.9
	Neutral	4	10.5	68.4
	Agree	2	5.3	73.7
	Strongly agree	10	26.3	100.0
SI – Working with Colleagues Online	Strongly disagree	1	2.6	2.6
	Disagree	2	5.3	7.9
	Neutral	8	21.1	28.9
	Agree	14	36.8	65.8
	Strongly agree	13	34.2	100.0
SI – Assistance on the Submission of Work Online	Strongly disagree	6	15.8	15.8
	Disagree	4	10.5	26.3
	Neutral	10	26.3	52.6
	Agree	10	26.3	78.9
	Strongly agree	8	21.1	100.0
SI – Assigned Mentors for the Use of Moodle	Strongly disagree	6	15.8	15.8
	Disagree	5	13.2	28.9
	Neutral	9	23.7	52.6
	Agree	13	34.2	86.8
	Strongly agree	5	13.2	100.0
SI – Ownership of Personal Laptop for Studies	Neutral	6	15.8	15.8
	Agree	7	18.4	34.2
	Strongly agree	25	65.8	100.0

SI – Most Classmates Own Personal Laptops	Strongly disagree	1	2.6	2.6
	Neutral	4	10.5	13.2
	Agree	17	44.7	57.9
	Strongly agree	16	42.1	100.0
SI – Part of the Community of Staff and Students	Neutral	3	7.9	7.9
	Agree	16	42.1	50.0
	Strongly agree	19	50.0	100.0
FC – Never Used Moodle in the Past	Strongly disagree	19	50.0	50.0
	Disagree	5	13.2	63.2
	Neutral	3	7.9	71.1
	Agree	4	10.5	81.6
	Strongly agree	7	18.4	100.0
FC – Working with Colleagues Online	Strongly disagree	1	2.6	2.6
	Disagree	2	5.3	7.9
	Neutral	11	28.9	36.8
	Agree	12	31.6	68.4
	Strongly agree	12	31.6	100.0
FC – Assistance on the Submission of Work Online	Strongly disagree	5	13.2	13.2
	Disagree	3	7.9	21.1
	Neutral	9	23.7	44.7
	Agree	12	31.6	76.3
	Strongly agree	9	23.7	100.0
FC – Assistance from Tutors on IT Issues	Strongly disagree	5	13.2	13.2
	Neutral	14	36.8	50.0
	Agree	9	23.7	73.7
	Strongly agree	10	26.3	100.0
FC – Part of the Community of Staff and Students	Strongly disagree	2	5.3	5.3
	Neutral	8	21.1	26.3
	Agree	13	34.2	60.5
	Strongly agree	15	39.5	100.0
FC – Availability of Library Resources	Strongly disagree	3	7.9	7.9
	Neutral	8	21.1	28.9
	Agree	13	34.2	63.2
	Strongly agree	14	36.8	100.0
FC – Efficient Moodle and Mahara Sites	Strongly disagree	2	5.3	5.3
	Disagree	3	7.9	13.2
	Neutral	7	18.4	31.6
	Agree	16	42.1	73.7
	Strongly agree	10	26.3	100.0
FC – Conducive Learning Environment	Strongly disagree	2	5.3	5.3
	Disagree	2	5.3	10.5
	Neutral	4	10.5	21.1
	Agree	19	50.0	71.1
	Strongly agree	11	28.9	100.0
FC – Effectiveness of Socrative Software Application	Strongly disagree	1	2.6	2.6
	Disagree	1	2.6	5.3
	Neutral	4	10.5	15.8
	Agree	13	34.2	50.0
	Strongly agree	19	50.0	100.0
BI – Continuous Use of IT resources in Learning	Neutral	3	7.9	7.9
	Agree	13	34.2	42.1
	Strongly agree	22	57.9	100.0
BI – Engagement with IT Invention	Neutral	6	15.8	15.8
	Agree	13	34.2	50.0
	Strongly agree	19	50.0	100.0
BI – Envisage Unlimited Use of IT in Learning	Strongly disagree	2	5.3	5.3
	Disagree	1	2.6	7.9
	Neutral	12	31.6	39.5
	Agree	11	28.9	68.4
	Strongly agree	12	31.6	100.0
BI – Achieved Learning Objectives without IT	Strongly disagree	4	10.5	10.5
	Disagree	7	18.4	28.9
	Neutral	8	21.1	50.0
	Agree	6	15.8	65.8
	Strongly agree	13	34.2	100.0
LE – Positive learning Experience	Strongly disagree	1	2.6	2.6
	Neutral	3	7.9	10.5
	Agree	16	42.1	52.6
	Strongly agree	18	47.4	100.0
LE – Satisfied Learning Style Adopted	Disagree	1	2.6	2.6
	Neutral	4	10.5	13.2

	Agree	17	44.7	57.9
	Strongly agree	16	42.1	100.0
LE – Effective Learning Style	Neutral	7	18.4	18.4
	Agree	14	36.8	55.3
	Strongly agree	17	44.7	100.0
LE – Intellectually Stimulating Module	Disagree	1	2.6	2.6
	Neutral	3	7.9	10.5
	Agree	14	36.8	47.4
	Strongly agree	20	52.6	100.0
SE– Equal Opportunity of Participation in Session	Neutral	4	10.5	10.5
	Agree	15	39.5	50.0
	Strongly agree	19	50.0	100.0
SE – Opportunity for Academic & Social Interactions	Neutral	5	13.2	13.2
	Agree	14	36.8	50.0
	Strongly agree	19	50.0	100.0
SE – Positive Experience During Learning Activities	Disagree	1	2.6	2.6
	Neutral	5	13.2	15.8
	Agree	13	34.2	50.0
	Strongly agree	19	50.0	100.0
SE – Good Student-Teacher Interaction	Neutral	4	10.5	10.5
	Agree	13	34.2	44.7
	Strongly agree	21	55.3	100.0
SE – Opportunity for Collaborative Learning	Neutral	5	13.2	13.2
	Agree	15	39.5	52.6
	Strongly agree	18	47.4	100.0
SE – Effective Learning from Colleagues	Neutral	7	18.4	18.4
	Agree	16	42.1	60.5
	Strongly agree	15	39.5	100.0
SE – Participatory Delivery Style	Strongly disagree	1	2.6	2.6
	Neutral	3	7.9	10.5
	Agree	17	44.7	55.3
	Strongly agree	17	44.7	100.0
General Comment	Negative	2	5.3	5.3
	Neutral	30	78.9	84.2
	Positive	6	15.8	100.0

*PE = Performance Expectancy; EE = Effort Expectancy; SI = Social Influence; FC = Facilitating Condition; BI = Behavioural Intention; LE = Learning Experience; SE = Students' Engagement

Table 3

Inter-construct correlation analysis - traditional learning

	TLE-CLE	TLE-LO	TLE-CL	TLE-SMA	LE-PLE	LE-SLA	LE-ELA	LE-ISM	SE-PTS	SE-PAS	SE-PLA	SE-STI	SE-CL	SE-OLC	SE-DSM
TLE-CLE	1.000	.676	.449	.376	.554	.550	.378	.366	.563	.395	.464	.545	.640	.297	.534
TLE-LO	.676	1.000	.614	.511	.652	.791	.578	.392	.571	.498	.436	.568	.733	.530	.613
TLE-CL	.449	.614	1.000	.629	.709	.749	.697	.373	.484	.571	.451	.642	.684	.495	.612
TLE-SMA	.376	.511	.629	1.000	.649	.762	.721	.748	.494	.426	.743	.507	.660	.642	.751
LE-PLE	.554	.652	.709	.649	1.000	.853	.737	.627	.674	.507	.673	.639	.727	.520	.664
LE-SLA	.550	.791	.749	.762	.853	1.000	.797	.604	.645	.568	.695	.598	.798	.650	.796
LE-ELA	.378	.578	.697	.721	.737	.797	1.000	.639	.691	.562	.594	.673	.698	.606	.669
LE-ISM	.366	.392	.373	.748	.627	.604	.639	1.000	.472	.214	.730	.417	.628	.526	.663
SE-PTS	.563	.571	.484	.494	.674	.645	.691	.472	1.000	.738	.485	.803	.665	.515	.624
SE-PAS	.395	.498	.571	.426	.507	.568	.562	.214	.738	1.000	.358	.737	.669	.564	.444
SE-PLA	.464	.436	.451	.743	.673	.695	.594	.730	.485	.358	1.000	.436	.653	.635	.708
SE-STI	.545	.568	.642	.507	.639	.598	.673	.417	.803	.737	.436	1.000	.740	.591	.540
SE-CL	.640	.733	.684	.660	.727	.798	.698	.628	.665	.669	.653	.740	1.000	.665	.800
SE-OLC	.297	.530	.495	.642	.520	.650	.606	.526	.515	.564	.635	.591	.665	1.000	.603
SE-DSM	.534	.613	.612	.751	.664	.796	.669	.663	.624	.444	.708	.540	.800	.603	1.000

Table 4(a)

Inter-construct correlation analysis - blended learning

	PE-BITC	PE-MITC	PE-AITC	PE-ITKP	PE-MWIH	PE-PWM	EE-EMLA	EE-3hrsIT	EE-MTIT	EE-MDU	EE-3hrsM	EE-DMM	EE-LIUM	EE-ESSA	SI-NUMP
PE-BITC	1.000	.449	.377	.190	-.032	-.266	.275	.014	-.158	.195	.083	-.252	.357	.210	-.008

PE-MITC	.449	1.000	.676	.462	.242	-.110	-.022	.222	.149	.077	-.157	.062	.063	.190	.217
PE-AITC	.377	.676	1.000	.513	.203	.032	.117	.093	-.061	.273	-.005	.049	.140	.290	.046
PE-ITKP	.190	.462	.513	1.000	.307	-.049	-.082	.091	.199	.103	-.206	.411	.042	.102	.071
PE-MWIH	-.032	.242	.203	.307	1.000	.302	.082	.064	.370	.094	-.072	.226	.132	.027	.231
PE-PWM	-.266	-.110	.032	-.049	.302	1.000	-.059	.116	.347	-.018	.274	.364	.374	.037	.526
EE-EMLA	.275	-.022	.117	-.082	.082	-.059	1.000	.293	.045	.265	.321	-.244	.249	.543	-.246
EE-3hrsIT	.014	.222	.093	.091	.064	.116	.293	1.000	.674	-.232	-.108	.163	.164	.198	.027
EE-MTIT	-.158	.149	-.061	.199	.370	.347	.045	.674	1.000	-.223	-.067	.350	.168	.074	.250
EE-MDU	.195	.077	.273	.103	.094	-.018	.265	-.232	-.223	1.000	.479	.098	.229	.088	.043
EE-3hrsM	.083	-.157	-.005	-.206	-.072	.274	.321	-.108	-.067	.479	1.000	.214	.594	.039	.249
EE-DMM	-.252	.062	.049	.411	.226	.364	-.244	.163	.350	.098	.214	1.000	.289	.023	.276
EE-LIUM	.357	.063	.140	.042	.132	.374	.249	.164	.168	.229	.594	.289	1.000	.003	.310
EE-ESSA	.210	.190	.290	.102	.027	.037	.543	.198	.074	.088	.039	.023	.003	1.000	-.305
SI-NUMP	-.008	.217	.046	.071	.231	.526	-.246	.027	.250	.043	.249	.276	.310	-.305	1.000
SI-WCO	.091	.172	.039	-.108	.113	.147	.043	-.038	.087	-.240	-.120	-.295	.132	.102	.108
SI-SASO	.012	.125	-.027	-.108	-.197	.225	.059	.212	.070	.175	.302	.128	.287	-.216	.565
SI-AMUM	.115	.206	.242	-.130	.196	.191	.283	-.058	-.075	.402	.409	-.076	.235	-.065	.412
SI-OPLS	.190	.124	.141	.000	-.148	-.151	.086	.145	-.088	.014	-.092	-.067	.064	.199	.031
SI-MCPL	-.314	-.050	-.272	.084	.203	-.098	-.132	-.020	.045	-.339	-.112	.159	-.167	-.192	-.027
SI-PCSS	-.115	.088	.009	.130	.140	-.158	.024	-.016	-.003	-.186	-.174	-.043	-.357	.183	-.267
FC-NMP	-.034	.225	.024	.088	.207	.530	-.245	.134	.370	.108	.265	.347	.351	-.347	.892
FC-WCO	.190	.262	.299	.234	.115	.231	.158	.288	.159	-.171	.075	.062	.333	.192	.182
FC-ASW	.040	.085	-.011	-.027	.080	.218	.083	.248	.093	.196	.222	.073	.274	-.239	.529
FC-ATIT	-.031	.149	.276	-.058	.122	.207	.181	.012	-.026	.193	.356	.081	.131	.060	.338
FC-PCSS	.370	.201	.262	.193	-.064	-.031	.151	.348	.212	-.289	-.019	-.029	.150	.239	.067
FC-ALR	.476	-.033	.028	-.035	-.164	-.025	.328	.253	-.031	-.021	.104	-.263	.234	.234	-.075
FC-EMS	.410	-.018	.113	-.110	.011	-.077	.460	.131	-.065	.185	.361	-.340	.271	.148	.007
FC-CLE	.294	-.036	.005	.009	-.003	.053	.265	.096	.030	.119	.247	-.190	.219	-.068	.126
FC-ESSA	.212	.145	.131	.237	.002	-.012	.118	.301	.241	-.087	.027	.056	.099	.092	.016
BI-CITRL	.020	.097	.083	.076	-.111	-.081	.355	.171	.103	.213	.233	.106	.075	.468	-.108
BI-EITInv	-.038	.109	.196	.024	-.270	-.033	.042	.079	-.050	.520	.333	.224	.079	.316	-.052
BI-NEUIT	-.243	-.054	.145	.188	.213	.392	-.082	.322	.291	.162	.143	.552	.203	-.071	.384
BI-ALOIT	-.356	-.122	.009	-.042	.147	.322	-.016	.186	.228	.031	.320	.420	.116	-.088	.315
LE-PLE	.224	.293	.229	.103	-.060	-.115	.082	.235	.326	.316	.270	.275	.208	.116	-.111
LE-SLSA	.161	.222	.164	.003	.111	-.042	.018	.168	.345	.311	.218	.182	.175	.066	-.143
LE-ELS	.195	.222	.164	.036	.057	-.042	.105	.044	.257	.255	.351	.273	.175	.165	.000
LE-ISM	-.089	.044	-.002	-.028	.209	.131	.158	.129	.322	-.094	.250	.117	.082	.174	.093
SE-EOPS	-.021	.095	.077	-.067	-.041	.084	.176	.097	.259	.052	.160	.080	.034	.249	.080
SE-OASI	-.086	.146	.177	-.071	.027	.125	.036	.198	.261	.147	.123	.191	.085	.257	-.087
SE-PELA	.103	.188	.038	-.045	.090	.113	.085	-.029	.298	.145	.331	.075	.192	.121	.154
SE-GSTI	-.078	.070	.097	.021	-.058	.080	.111	.198	.274	.157	.101	.189	.010	.262	-.170
SE-OCL	-.003	.248	.244	.026	-.022	.083	.044	.128	.278	.127	.152	.235	.028	.332	-.033
SE-ELC	.004	.250	.185	-.011	.102	.101	.077	.334	.382	.220	.277	.131	.201	.054	.126
SE-PDS	-.019	.117	.061	-.079	.266	.149	.089	.063	.301	.123	.344	.068	.278	.043	.177

* PE = Performance Expectancy; EE = Effort Expectancy; SI = Social Influence; FC = Facilitating Condition; BI = Behavioural Intention; LE = Learning Experience; SE = Students' Engagement; PE-BITC = Basic Computer Capabilities; PE-MITC = Moderate Computer Capabilities; PE-AITC = Advanced Computer Capabilities; PE-ITKP = IT Knowledge Dictates Academic Performance; PE-MWIH = Use of Moodle or Mahara without IT Help; PE-PWM = Achieving Pass Mark without Moodle; EE-EMLA = Easy Access to Moodle in Learning Activities; EE-3hrsIT = At least 3 Hours of Daily Internet Use; EE-MTIT = More than 3 Hours of Daily Internet Use; EE-MDU = Daily Use of Moodle or Mahara; EE-3hrsM = At least 3 Hours of Daily Use of Moodle; EE-DMM = Dislike for the Use of Moodle or Mahara; EE-LIUM = Learning Interest to Use Moodle; EE-ESSA = Effective Use of Socrative Software Application; SI-NUMP = Never Used Moodle in the Past.

Table 4(b)

Inter-construct correlation analysis - blended learning

	SI-WCO	SI-SASO	SI-AMUM	SI-OPLS	SI-MCPL	SI-PCSS	FC-NMP	FC-WCO	FC-ASW	FC-ATIT	FC-PCSS	FC-ALR	FC-EMS	FC-CLE	FC-ESSA
PE-BITC	.091	.012	.115	.190	-.314	-.115	-.034	.190	.040	-.031	.370	.476	.410	.294	.212
PE-MITC	.172	.125	.206	.124	-.050	.088	.225	.262	.085	.149	.201	-.033	-.018	-.036	.145
PE-AITC	.039	-.027	.242	.141	-.272	.009	.024	.299	-.011	.276	.262	.028	.113	.005	.131
PE-ITKP	-.108	-.108	-.130	.000	.084	.130	.088	.234	-.027	-.058	.193	-.035	-.110	.009	.237
PE-MWIH	.113	-.197	.196	-.148	.203	.140	.207	.115	.080	.122	-.064	-.164	.011	-.003	.002
PE-PWM	.147	.225	.191	-.151	-.098	-.158	.530	.231	.218	.207	-.031	-.025	-.077	.053	-.012
EE-EMLA	.043	.059	.283	.086	-.132	.024	-.245	.158	.083	.181	.151	.328	.460	.265	.118
EE-3hrsIT	-.038	.212	-.058	.145	-.020	-.016	.134	.288	.248	.012	.348	.253	.131	.096	.301
EE-MTIT	.087	.070	-.075	-.088	.045	-.003	.370	.159	.093	-.026	.212	-.031	-.065	.030	.241
EE-MDU	-.240	.175	.402	.014	-.339	-.186	.108	-.171	.196	.193	-.289	-.021	.185	.119	-.087
EE-3hrsM	-.120	.302	.409	-.092	-.112	-.174	.265	.075	.222	.356	-.019	.104	.361	.247	.027
EE-DMM	-.295	.128	-.076	-.067	.159	-.043	.347	.062	.073	.081	-.029	-.263	-.340	-.190	.056
EE-LIUM	.132	.287	.235	.064	-.167	-.357	.351	.333	.274	.131	.150	.234	.271	.219	.099
EE-ESSA	.102	-.216	-.065	.199	-.192	.183	-.347	.192	-.239	.060	.239	.234	.148	-.068	.092
SI-NUMP	.108	.565	.412	.031	-.027	-.267	.892	.182	.529	.338	.067	-.075	.007	.126	.016
SI-WCO	1.000	.030	.214	.140	.078	.201	.061	.538	.059	.063	.230	.113	.110	.149	-.013
SI-SASO	.030	1.000	.537	.184	-.009	-.194	.528	.167	.773	.237	-.043	.136	.116	.149	-.098

SI-AMUM	.214	.537	1.000	.055	-.233	-.116	.364	.327	.632	.664	.077	.155	.505	.330	-.013
SI-OPLS	.140	.184	.055	1.000	.146	.166	.011	.069	.014	-.042	.253	.201	.080	.017	.075
SI-MCPL	.078	-.009	-.233	.146	1.000	.652	-.080	-.080	-.098	-.213	-.128	-.229	-.255	-.130	-.046
SI-PCSS	.201	-.194	-.116	.166	.652	1.000	-.299	.144	-.166	-.033	.103	.083	-.046	.091	.124
FC-NMP	.061	.528	.364	.011	-.080	-.299	1.000	.115	.437	.231	-.005	-.145	-.105	.032	-.060
FC-WCO	.538	.167	.327	.069	-.080	.144	.115	1.000	.355	.477	.679	.493	.444	.489	.542
FC-ASW	.059	.773	.632	.014	-.098	-.166	.437	.355	1.000	.399	.030	.240	.282	.302	.098
FC-ATIT	.063	.237	.664	-.042	-.213	-.033	.231	.477	.399	1.000	.334	.046	.435	.193	.314
FC-PCSS	.230	-.043	.077	.253	-.128	.103	-.005	.679	.030	.334	1.000	.628	.519	.491	.669
FC-ALR	.113	.136	.155	.201	-.229	.083	-.145	.493	.240	.046	.628	1.000	.733	.780	.491
FC-EMS	.110	.116	.505	.080	-.255	-.046	-.105	.444	.282	.435	.519	.733	1.000	.732	.423
FC-CLE	.149	.149	.330	.017	-.130	.091	.032	.489	.302	.193	.491	.780	.732	1.000	.645
FC-ESSA	-.013	-.098	-.013	.075	-.046	.124	-.060	.542	.098	.314	.669	.491	.423	.645	1.000
BI-CITRL	.124	.093	-.065	.137	.074	.260	-.168	.081	.016	-.148	-.020	.236	.133	.259	.132
BI-EITInv	-.047	.284	.168	.309	-.174	.086	-.010	.002	.144	.071	-.046	.190	.134	.105	-.054
BI-NEUIT	-.010	.240	.351	.194	-.061	-.101	.363	.378	.388	.428	.216	.029	.137	.126	.185
BI-ALOIT	.093	.278	.438	.063	.044	.115	.264	.386	.431	.567	.284	.022	.210	.153	.152
LE-PLE	-.107	-.028	.003	.126	-.107	.147	.157	-.035	-.205	-.051	.143	.026	-.034	.090	.130
LE-SLSA	.089	-.096	.039	.093	-.015	.265	.079	.020	-.176	-.084	.126	.086	.044	.162	.089
LE-ELS	.089	-.069	.122	.093	-.015	.321	.123	.159	-.176	.140	.295	.117	.109	.264	.238
LE-ISM	.488	.028	.296	.070	.187	.484	.064	.571	.090	.353	.395	.255	.343	.416	.266
SE-EOPS	.424	.149	.205	.078	.068	.352	.021	.324	.039	.110	.287	.249	.201	.310	.044
SE-OASI	.327	.009	.141	.199	.030	.360	-.042	.303	-.065	.090	.239	.201	.080	.148	.052
SE-PELA	.384	.021	.211	.044	-.033	.205	.205	.289	-.086	.237	.276	.144	.238	.317	.100
SE-GSTI	.230	.074	.132	.181	.045	.359	-.093	.372	-.018	.109	.320	.321	.216	.313	.188
SE-OCL	.252	-.012	.088	.075	-.048	.388	.013	.299	-.111	.196	.350	.167	.037	.146	.104
SE-ELC	.267	.159	.333	.048	-.038	.206	.232	.364	.123	.259	.339	.211	.328	.265	.073
SE-PDS	.498	.027	.359	.064	.053	.270	.205	.401	.051	.293	.268	.137	.312	.304	.004

* PE = Performance Expectancy; EE = Effort Expectancy; SI = Social Influence; FC = Facilitating Condition; BI = Behavioural Intention; LE = Learning Experience; SE = Students' Engagement; SI-WCO = Working with Colleagues Online; SI-SASO = Assistance on the Submission of Work Online; SI-AMUM = Assigned Mentors for the Use of Moodle; SI-OPLS = Ownership of Personal Laptop for Studies; SI-MCPL = Most Classmates Own Personal Laptops; SI-PCSS = Part of the Community of Staff and Students; FC-NMP = Never Used Moodle in the Past; FC-WCO = Working with Colleagues Online; FC-ASW = Assistance on the Submission of Work Online; FC-ATIT = Assistance from Tutors on IT Issues; FC-PCSS = Part of the Community of Staff and Students; FC-ALR = Availability of Library Resources; FC-EMS = Efficient Moodle and Mahara Sites; FC-CLE = Conducive Learning Environment; FC-ESSA = Effectiveness of Socrative Software Application.

Table 4(c)

Inter-construct correlation analysis - blended learning

	BI-CITRL	BI-EITInv	BI-NEUIT	BI-ALOIT	LE-PLE	LE-SLSA	LE-ELS	LE-ISM	SE-EOPS	SE-OASI	SE-PELA	SE-GSTI	SE-OCL	SE-ELC	SE-PDS
PE-BITC	.020	-.038	-.243	-.356	.224	.161	.195	-.089	-.021	-.086	.103	-.078	-.003	.004	-.019
PE-MITC	.097	.109	-.054	-.122	.293	.222	.222	.044	.095	.146	.188	.070	.248	.250	.117
PE-AITC	.083	.196	.145	.009	.229	.164	.164	-.002	.077	.177	.038	.097	.244	.185	.061
PE-ITKP	.076	.024	.188	-.042	.103	.003	.036	-.028	-.067	-.071	-.045	.021	.026	-.011	-.079
PE-MWIH	-.111	-.270	.213	.147	-.060	.111	.057	.209	-.041	.027	.090	-.058	-.022	.102	.266
PE-PWM	-.081	-.033	.392	.322	-.115	-.042	-.042	.131	.084	.125	.113	.080	.083	.101	.149
EE-EMLA	.355	.042	-.082	-.016	.082	.018	.105	.158	.176	.036	.085	.111	.044	.077	.089
EE-3hrsIT	.171	.079	.322	.186	.235	.168	.044	.129	.097	.198	-.029	.198	.128	.334	.063
EE-MTIT	.103	-.050	.291	.228	.326	.345	.257	.322	.259	.261	.298	.274	.278	.382	.301
EE-MDU	.213	.520	.162	.031	.316	.311	.255	-.094	.052	.147	.145	.157	.127	.220	.123
EE-3hrsM	.233	.333	.143	.320	.270	.218	.351	.250	.160	.123	.331	.101	.152	.277	.344
EE-DMM	.106	.224	.552	.420	.275	.182	.273	.117	.080	.191	.075	.189	.235	.131	.068
EE-LIUM	.075	.079	.203	.116	.208	.175	.175	.082	.034	.085	.192	.010	.028	.201	.278
EE-ESSA	.468	.316	-.071	-.088	.116	.066	.165	.174	.249	.257	.121	.262	.332	.054	.043
SI-NUMP	-.108	-.052	.384	.315	-.111	-.143	.000	.093	.080	-.087	.154	-.170	-.033	.126	.177
SI-WCO	.124	-.047	-.010	.093	-.107	.089	.089	.488	.424	.327	.384	.230	.252	.267	.498
SI-SASO	.093	.284	.240	.278	-.028	-.096	-.069	.028	.149	.009	.021	.074	-.012	.159	.027
SI-AMUM	-.065	.168	.351	.438	.003	.039	.122	.296	.205	.141	.211	.132	.088	.333	.359
SI-OPLS	.137	.309	.194	.063	.126	.093	.093	.070	.078	.199	.044	.181	.075	.048	.064
SI-MCPL	.074	-.174	-.061	.044	-.107	-.015	-.015	.187	.068	.030	-.033	.045	-.048	-.038	.053
SI-PCSS	.260	.086	-.101	.115	.147	.265	.321	.484	.352	.360	.205	.359	.388	.206	.270
FC-NMP	-.168	-.010	.363	.264	.157	.079	.123	.064	.021	-.042	.205	-.093	.013	.232	.205
FC-WCO	.081	.002	.378	.386	-.035	.020	.159	.571	.324	.303	.289	.372	.299	.364	.401
FC-ASW	.016	.144	.388	.431	-.205	-.176	-.176	.090	.039	-.065	-.086	-.018	-.111	.123	.051
FC-ATIT	-.148	.071	.428	.567	-.051	-.084	.140	.353	.110	.090	.237	.109	.196	.259	.293
FC-PCSS	-.020	-.046	.216	.284	.143	.126	.295	.395	.287	.239	.276	.320	.350	.339	.268
FC-ALR	.236	.190	.029	.022	.026	.086	.117	.255	.249	.201	.144	.321	.167	.211	.137
FC-EMS	.133	.134	.137	.210	-.034	.044	.109	.343	.201	.080	.238	.216	.037	.328	.312
FC-CLE	.259	.105	.126	.153	.090	.162	.264	.416	.310	.148	.317	.313	.146	.265	.304
FC-ESSA	.132	-.054	.185	.152	.130	.089	.238	.266	.044	.052	.100	.188	.104	.073	.004
BI-CITRL	1.000	.644	.076	.104	.298	.330	.385	.360	.522	.410	.310	.396	.383	.282	.225

BI-EITInv	.644	1.000	.256	.262	.426	.409	.362	.186	.420	.519	.309	.486	.489	.453	.271
BI-NEUIT	.076	.256	1.000	.729	.074	.133	.166	.332	.224	.379	.108	.345	.200	.423	.305
BI-ALOIT	.104	.262	.729	1.000	.060	.140	.266	.516	.375	.369	.276	.375	.357	.503	.461
LE-PLE	.298	.426	.074	.060	1.000	.881	.838	.266	.343	.476	.524	.451	.585	.584	.405
LE-SLSA	.330	.409	.133	.140	.881	1.000	.860	.474	.474	.664	.653	.650	.682	.715	.601
LE-ELS	.385	.362	.166	.266	.838	.860	1.000	.615	.631	.664	.740	.598	.782	.667	.643
LE-ISM	.360	.186	.332	.516	.266	.474	.615	1.000	.689	.626	.720	.694	.651	.621	.800
SE-EOPS	.522	.420	.224	.375	.343	.474	.631	.689	1.000	.807	.701	.713	.835	.689	.698
SE-OASI	.410	.519	.379	.369	.476	.664	.664	.626	.807	1.000	.589	.814	.867	.769	.678
SE-PELA	.310	.309	.108	.276	.524	.653	.740	.720	.701	.589	1.000	.664	.750	.698	.861
SE-GSTI	.396	.486	.345	.375	.451	.650	.598	.694	.713	.814	.664	1.000	.790	.714	.617
SE-OCL	.383	.489	.200	.357	.585	.682	.782	.651	.835	.867	.750	.790	1.000	.735	.696
SE-ELC	.282	.453	.423	.503	.584	.715	.667	.621	.689	.769	.698	.714	.735	1.000	.816
SE-PDS	.225	.271	.305	.461	.405	.601	.643	.800	.698	.678	.861	.617	.696	.816	1.000

* PE = Performance Expectancy; EE = Effort Expectancy; SI = Social Influence; FC = Facilitating Condition; BI = Behavioural Intention; LE = Learning Experience; SE = Students' Engagement; BI-CITRL = Continuous Use of IT resources in Learning; BI-EITInv = Engagement with IT Invention; BI-NEUIT = Not Envisaging Unlimited Use of IT in Learning; BI-ALOIT = Achieved Learning Objectives without IT; LE-PLE = Positive learning Experience; LE-SLSA = Satisfied Learning Style Adopted; LE-ELS = Effective Learning Style; LE-ISM = Intellectually Stimulating Module; SE-EOPS = Equal Opportunity of Participation in Session; SE-OASI = Opportunity for Academic & Social Interactions; SE-PELA = Positive Experience During Learning Activities; SE-GSTI = Good Student-Teacher Interaction; SE-OCL = Opportunity for Collaborative Learning; SE-ELC = Effective Learning from Colleagues; SE-PDS = Participatory Delivery Style.

The correlation matrix of the coefficients in the UTAUT model, as presented in Figure 2, is depicted in Table 4a-c. Table 3 represents the correlation of the coefficients in the triangular model for the traditional learning approach shown in Figure 1.

5.2.1 Triangular model for traditional learning approach

The results shown below are the coefficients for the two-way multivariate regression analysis. The details of the results were provided in Table 5.

Table 5

Regression analysis on the triangular model for traditional learning approach

	Unstandardised Coefficients		Standardised Coefficients	Adjusted R^2	t-value	Sig.	Hypothesis Supported
	B	Std Error	β				
H_{01}				0.767			
TLE-ConLearnEnv	-.004	.094	-.005		.219	.828	No
TLE-LearnOut	-.095	.141	-.108		-.038	.970	No
TLE-ClassLay	.297	.144	.299		-.674	.506	No
TLE-SatModArr	-.150	.158	-.157		2.054	.049	Yes**
LE-SLAppr	.700	.207	.749		-.950	.350	No
LE-EffLearnApp	-.092	.137	-.108		3.375	.002	Yes***
LE-IntelStimMod	.183	.141	.203		-.670	.508	No
SE-ParticTS	.284	.169	.335		1.296	.205	No
SE-PAcadSocInt	-.174	.153	-.188		1.679	.104	No
SE-PosLearnAct	.199	.147	.195		-1.135	.266	No
SE-StudTeachInt	.068	.167	.072		1.350	.188	No
SE-CollobLearn	.095	.210	.101		.406	.688	No
SE-OpportLColl	-.101	.112	-.113		.452	.655	No
SE-DelStyleMotP	-.241	.137	-.306		-.900	.375	No

H_{02}				0.637			
TLE-ConLearnEnv	.117	.096	.134		1.222	.232	No
TLE-LearnOut	.115	.148	.110		.776	.444	No
TLE-ClassLay	-.408	.143	-.348		-2.847	.008	Yes***
TLE-SatModArr	-.188	.165	-.166		-1.142	.263	No
LE-PosLE	.312	.186	.264		1.679	.104	No
LE-SLAppr	-.077	.256	-.070		-.301	.765	No
LE-EffLearnApp	.242	.137	.241		1.763	.088	No
LE-IntelStimMod	.160	.149	.151		1.076	.291	No
SE-PAcadSocInt	.553	.127	.508		4.341	.000	Yes***
SE-PosLearnAct	-.060	.159	-.050		-.380	.707	No
SE-StudTeachInt	.491	.151	.440		3.257	.003	Yes***
SE-CollobLearn	-.557	.195	-.503		-2.856	.008	Yes***
SE-OpportLColl	-.086	.118	-.081		-.725	.474	No
SE- DelStyleMotP	.432	.128	.467		3.364	.002	Yes***

*TLE = Traditional Learning Environment; LE = Learning Experience; SE = Students' Engagement; ConLearnEnv = Conducive Learning Environment; LearnOut = Achieving Learning Outcomes; ClassLay = Effective Classroom Layout; SatModArr = Satisfactory Module Arrangement; PosLE = Positive Learning Experience; SLAppr = Satisfactory Learning Approach; EffLearnApp = Effective Learning Approach; IntelStimMod = Intellectually Stimulating Module; PosLE = Positive Learning Experience; ParticTS = Participatory Teaching Session; PAcadSocInt = Presence of Academic and Social Interaction; PosLearnAct = Positive Learning Activities; StudTeachInt =Satisfactory Students-Teacher Interaction; CollobLearn = Presence of Collaborative Learning; OpportLColl = Opportunity to Learn from Colleagues; DelStyleMotP = Delivery Styles Motivates Participation.

Our results indicated that only the module's structure and learning approach determine students' positive learning experience. In reference to H_{01}, it suggests that the attributes of the traditional learning environment, such as conducive learning environment, classroom arrangement or layout and achievement of learning outcomes, have no direct relationship with students' positive learning experience. In testing H_{02}, we discovered that class layout or arrangement and students' perception of the opportunities for academic and social interaction are directly related to students' engagement. Also, student-teacher interaction and collaborative learning were found to be strongly significant.

Table 6

Regression analysis on the unified theory of acceptance and use of technology (UTAUT) model for blended learning approach

	Unstandardised Coefficients		Standardised Coefficients	Adjusted R^2	t-value	Sig.	Hypothesis Supported
	B	Std Error	β				
H_{03}							
Gend-M1	-.058	.224	-.043	-.026	-.261	.796	No
Gend-M2	-.052	.258	-.034	-.027	-.203	.841	No
Gend-M3	-.265	.377	-.116	-.014	-.702	.487	No
Gend-M4	.489	.481	.167	.001	1.016	.316	No

H_{03} (i)							
Gend-M1	-.126	.355	-.059	-.024	-.356	.724	No
Gend-M2	.068	.298	.038	-.026	.227	.822	No
Gend-M3	-.418	.341	-.200	.013	-1.226	.228	No
Gend-M4	-.265	.377	-.116	-.014	-.702	.487	No
Gend-M5	.378	.451	.139	-.008	.839	.407	No
Gend-M6	.797	.426	.297	.063	1.869	.070	Yes*
H_{03} (ii)							
Gend-M1	-.123	.285	-.072	-.022	-.433	.668	No
Gend-M2	-.132	.296	-.074	-.022	-.447	.657	No
Gend-M3	.222	.278	.132	-.010	.797	.431	No
Gend-M4	.262	.439	.099	-.018	.596	.555	No
Gend-M5	.508	.459	.181	.006	1.107	.276	No
Gend-M6	.554	.540	.169	.001	1.026	.312	No
Gend-M7	.237	.478	.082	-.021	.496	.623	No
Gend-M8	.025	.247	.017	-.027	.100	.921	No
H_{03} (iii)							
Gend-M1	.760	.588	.210	.018	1.292	.205	No
Gend-M2	-.271	.348	-.129	-.011	-.778	.441	No
Gend-M3	.185	.467	.066	-.023	.396	.695	No
Gend-M4	-.123	.445	-.046	-.026	-.277	.784	No
Gend-M5	-.409	.255	-.258	.041	-1.603	.118	No
Gend-M6	-.243	.293	-.137	-.008	-.831	.412	No
Gend-M7	-.055	.222	-.041	-.026	-.249	.805	No
H_{04}							
Age-M1	.181	.394	.076	-.022	.460	.648	No
Age-M2	.352	.451	.129	-.011	.782	.439	No
Age-M3	-.133	.667	-.033	-.027	-.200	.843	No
Age-M4	.238	.858	.046	-.026	.277	.783	No
H_{04} (i)							
Age-M1	-.181	1.058	-.028	-.027	-.171	.865	No
Age-M2	.419	.613	.113	-.015	.683	.499	No
Age-M3	-.648	.816	-.131	-.010	-.794	.433	No
Age-M4	-.533	.778	-.113	-.015	-.685	.498	No
Age-M5	-.181	.464	-.065	-.023	-.390	.699	No
Age-M6	.829	.501	.266	.045	1.654	.107	No
Age-M7	.629	.377	.267	.046	1.665	.105	No
H_{04} (ii)							
Age-M1	-.895	.479	-.297	.063	-1.868	.070	Yes*
Age-M2	-.790	.505	-.253	.038	-1.566	.126	No
Age-M3	.019	.493	.006	-.028	.039	.969	No
Age-M4	.410	.772	.088	-.020	.530	.599	No
Age-M5	-.333	.819	-.068	-.023	-.407	.686	No
Age-M6	.952	.950	.165	.027	1.002	.323	No
Age-M7	-1.724	.793	-.341	.091	-2.174	.036	Yes**
Age-M8	-.038	.435	-.015	-.028	-.088	.931	No
H_{04} (iii)							

Age-M1	-2.067	.522	-.551	.284	-3.962	.000	Yes***
Age-M2	.438	.519	.139	-.008	.843	.405	No
Age-M3	.286	.611	.078	-.022	.468	.643	No
Age-M4	-.133	.667	-.033	-.027	-.200	.843	No
Age-M5	.410	.798	.085	-.020	.513	.611	No
Age-M6	.124	.785	.026	-.027	.158	.876	No
$H_{04\ (iv)}$							
Age-M1	-.010	.985	-.002	-.028	-.010	.992	No
Age-M2	-.914	.608	-.243	.033	-1.504	.141	No
Age-M3	-1.210	.772	-.253	.038	-1.566	.126	No
Age-M4	.181	.773	.039	-.026	.234	.816	No
Age-M5	-1.838	.564	-.477	.206	-3.259	.002	Yes***
Age-M6	-3.171	.459	-.755	.558	-6.907	.000	Yes***
Age-M7	-2.638	.508	-.655	.413	-5.196	.000	Yes***
Age-M8	-2.086	.538	-.543	.275	-3.880	.000	Yes***
Age-M9	-1.010	.554	-.291	.059	-1.822	.077	Yes***
H_{05}							
WExp-M1	.204	.122	.269	.047	1.676	.102	No
WExp-M2	.235	.140	.269	.047	1.678	.102	No
WExp-M3	-.267	.209	-.209	.017	-1.279	.209	No
WExp-M4	-.058	.275	-.035	-.027	-.209	.835	No
$H_{05\ (i)}$							
WExp-M1	-.284	.312	-.150	-.005	-.911	.369	No
WExp-M2	-.228	.197	-.190	.009	-1.159	.254	No
WExp-M3	-.651	.231	-.424	.157	-2.813	.008	Yes***
WExp-M4	-.352	.240	-.237	.030	-1.465	.152	No
WExp-M5	-.259	.201	-.210	.017	-1.287	.206	No
WExp-M6	-.225	.221	-.168	.001	-1.020	.314	No
WExp-M7	-.231	.211	-.179	.005	-1.093	.281	No
WExp-M8	-.262	.200	-.213	.019	-1.311	.198	No
WExp-M9	-.324	.177	-.291	.059	-1.826	.076	Yes*
$H_{05\ (ii)}$							
WExp-M1	-.068	.160	-.071	-.023	-.426	.672	No
WExp-M2	-.134	.165	-.133	-.009	-.808	.425	No
WExp-M3	.049	.158	.051	-.025	.309	.759	No
WExp-M4	.011	.248	.007	-.028	.043	.966	No
WExp-M5	.147	.261	.093	-.019	.563	.577	No
WExp-M6	-.156	.307	-.084	-.020	-.508	.614	No
WExp-M7	-.114	.269	-.070	-.023	-.424	.674	No
WExp-M8	.051	.139	.061	-.024	.365	.717	No
$H_{05\ (iii)}$							
WExp-M1	-.500	.328	-.246	.035	-1.524	.136	No
WExp-M2	.258	.193	.217	.021	1.336	.190	No
WExp-M3	-.324	.258	-.205	.015	-1.256	.217	No
WExp-M4	-.291	.246	-.193	.011	-1.182	.245	No
WExp-M5	-.019	.149	-.021	-.027	-.125	.902	No
WExp-M6	-.177	.164	-.177	.004	-1.079	.288	No
WExp-M7	-.021	.125	-.029	-.027	-.171	.865	No

H_{06}							
VUse-M1	-.132	.639	-.034	-.027	-.207	.838	No
VUse-M2	-.104	.372	-.047	-.026	-.280	.781	No
VUse-M3	-.667	.484	-.224	.024	-1.376	.177	No
VUse-M4	-.215	.472	-.076	-.022	-.456	.651	No
VUse-M5	-.132	.280	-.078	-.021	-.471	.640	No
VUse-M6	-.257	.311	-.136	-.009	-.827	.414	No
VUse-M7	-.090	.236	-.064	-.024	-.382	.704	No
$H_{07\ (i)}$				-.149			
PEBasITCap	-.043	.131	-.069		-.331	.743	No
PEModITCap	.080	.196	.106		.408	.686	No
PEAdvITCap	.022	.167	.035		.135	.894	No
PEITKNAcadPer	.040	.128	.068		.315	.755	No
PEITHelpMoodle	-.077	.099	-.156		-.777	.443	No
PEMoodleIRR	-.019	.099	-.038		-.194	.848	No
$H_{07\ (ii)}$				.008			
PEBasITCap	-.139	.140	-.191		-.995	.328	No
PEModITCap	.091	.209	.105		.434	.668	No
PEAdvITCap	.207	.178	.279		1.160	.255	No
PEITKNAcadPer	-.013	.137	-.019		-.095	.925	No
PEITHelpMoodle	-.204	.106	-.360		-1.934	.062	Yes*
PEMoodleIRR	.015	.106	.026		.144	.887	No
$H_{07\ (iii)}$				.115			
PEBasITCap	-.213	.194	-.199		-1.097	.281	No
PEModITCap	-.239	.290	-.188		-.823	.417	No
PEAdvITCap	.247	.247	.226		.997	.326	No
PEITKNAcadPer	.194	.190	.194		1.024	.314	No
PEITHelpMoodle	.045	.146	.054		.310	.759	No
PEMoodleIRR	.258	.147	.304		1.756	.089	Yes*
$H_{07\ (iv)}$				.050			
PEBasITCap	-.454	.258	-.331		-1.758	.089	Yes*
PEModITCap	-.120	.387	-.073		-.311	.758	No
PEAdvITCap	.268	.329	.191		.814	.422	No
PEITKNAcadPer	-.073	.253	-.057		-.290	.774	No
PEITHelpMoodle	.080	.195	.074		.408	.686	No
PEMoodleIRR	.213	.196	.195		1.086	.286	No
$H_{08\ (i)}$				.109			
EEEasyMoodLA	.035	.196	.045		2.100	.045	Yes**
EEMin3hrsInt	.093	.180	.123		.180	.858	No
EEMuchTmInt	.030	.181	.037		.516	.610	No
EEMoodMahdly	.060	.096	.118		.163	.871	No
EEMin3hrsMoodMah	.115	.110	.239		.622	.539	No
EEDislMoodMah	.023	.082	.055		1.044	.305	No
EEEffLearnMoodMah	-.069	.097	-.148		.273	.787	No
EESocrAppEasy	.360	.179	.396		-.715	.481	No
$H_{08\ (ii)}$				.468			

EEEasyMoodLA	-.551	.174	-.608		-3.161	.004	Yes***
EEMin3hrsInt	.440	.160	.505		2.749	.010	Yes***
EEMuchTmInt	-.191	.161	-.207		-1.187	.245	No
EEMoodMahdly	.332	.086	.566		3.875	.001	Yes***
EEMin3hrsMoodMah	.214	.098	.386		2.186	.037	Yes**
EEDislMoodMah	-.017	.073	-.036		-.231	.819	No
EEEffLearnMoodMah	-.090	.086	-.167		-1.047	.304	No
EESocrAppEasy	.520	.159	.498		3.265	.003	Yes***
H08 (iii)				.261			
EEEasyMoodLA	-.059	.302	-.044		-.195	.847	No
EEMin3hrsInt	.507	.277	.396		1.830	.078	Yes***
EEMuchTmInt	-.111	.278	-.082		-.397	.694	No
EEMoodMahdly	.183	.148	.213		1.236	.226	No
EEMin3hrsMoodMah	.012	.169	.015		.073	.942	No
EEDislMoodMah	.343	.127	.495		2.705	.011	Yes**
EEEffLearnMoodMah	-.030	.149	-.038		-.201	.842	No
EESocrAppEasy	-.230	.276	-.150		-.834	.411	No
H08 (iv)				.159			
EEEasyMoodLA	.146	.414	.085		.354	.726	No
EEMin3hrsInt	.313	.380	.190		.822	.418	No
EEMuchTmInt	.047	.382	.027		.123	.903	No
EEMoodMahdly	-.137	.203	-.123		-.672	.507	No
EEMin3hrsMoodMah	.506	.232	.483		2.177	.038	Yes**
EEDislMoodMah	.362	.174	.405		2.076	.047	Yes**
EEEffLearnMoodMah	-.323	.205	-.317		-1.578	.126	No
EESocrAppEasy	-.375	.378	-.190		-.991	.330	No
H09 (i)				-.022			
SINotUsdMoodMahPst	-.044	.080	-.119		-.552	.585	No
SIHelpCollonline	.071	.114	.111		.621	.539	No
SISeekAsstClassmAss	.174	.112	.363		1.554	.131	No
SIMentAsstMoodMah	-.127	.111	-.252		-1.144	.262	No
SIPersLaptop	.036	.148	.043		.245	.808	No
SIMostClassLaptop	-.207	.184	-.273		-1.125	.269	No
SIPartCommStaffStd	.421	.250	.418		1.682	.103	No
H09 (ii)				.176			
SINotUsdMoodMahPst	-.078	.083	-.182		-.945	.352	No
SIHelpCollonline	-.082	.118	-.111		-.695	.492	No
SISeekAsstClassmAss	.248	.116	.449		2.147	.040	Yes**
SIMentAsstMoodMah	-.031	.115	-.054		-.271	.789	No
SIPersLaptop	.247	.153	.253		1.612	.117	No
SIMostClassLaptop	-.426	.190	-.487		-2.239	.033	Yes**
SIPartCommStaffStd	.484	.259	.417		1.868	.072	Yes*
H09 (iii)				.076			
SINotUsdMoodMahPst	.223	.129	.353		1.728	.094	Yes*
SIHelpCollonline	-.149	.183	-.138		-.815	.421	No
SISeekAsstClassmAss	-.136	.180	-.168		-.756	.456	No
SIMentAsstMoodMah	.267	.178	.314		1.497	.145	No
SIPersLaptop	.313	.238	.218		1.313	.199	No

SIMostClassLaptop	.015	.296	.012		.051	.960	No
SIPartCommStaffStd	-.033	.403	-.019		-.081	.936	No
$H_{09\ (iv)}$				.088			
SINotUsdMoodMahPst	.190	.165	.234		1.152	.258	No
SIHelpCollonline	-.088	.234	-.063		-.376	.709	No
SISeekAsstClassmAss	-.018	.230	-.017		-.079	.938	No
SIMentAsstMoodMah	.427	.228	.389		1.871	.071	Yes*
SIPersLaptop	.016	.305	.009		.052	.959	No
SIMostClassLaptop	-.015	.378	-.009		-.039	.969	No
SIPartCommStaffStd	.517	.515	.236		1.005	.323	No
H_{010}				.134			
FCNotUsdMoodMahPst	.226	.100	.451		2.266	.031	Yes**
FCHelpCollOnline	.085	.196	.109		.436	.666	No
FCSeekAsstClssmaMood	.062	.138	.101		.452	.655	No
FCPersTutAssITIssues	-.319	.164	-.501		-1.947	.062	Yes*
FCPartCommStaffStd	.165	.249	.215		.665	.511	No
FCLibResAvailSuppLrn	-.254	.267	-.360		-.952	.349	No
FCMoodMahWellOrg	.237	.243	.322		.973	.339	No
FCCondLearnEnv	-.257	.278	-.334		-.925	.363	No
FCSocAppHelp	.399	.235	.468		1.700	.100	No
H_{011}				.249			
BIContUsgITResLearn	-.408	.369	-.207		-1.105	.277	No
BIEngInvITEnhLE	1.148	.332	.673		3.462	.002	Yes***
BINotEnvLmtITLA	.235	.244	.203		.965	.342	No
BIAchLearnObjWtoutIT	-.245	.189	-.271		-1.294	.204	No
H_{012}				.048			
TLEConLearnEnv	-.053	.145	-.086		-.364	.718	No
TLELearnOut	-.171	.196	-.231		-.873	.389	No
TLEClassLay	.022	.190	.026		.114	.910	No
TLEOverArr	-.133	.164	-.168		-.813	.422	No
H_{013}				.100			
FCLibResAvailSuppLrn	-.551	.216	-.687		-2.550	.016	Yes***
FCMoodMahWellOrg	.366	.208	.438		1.764	.087	Yes*
FCCondLearnEnv	.036	.269	.041		.134	.894	No
FCSocAppHelp	.042	.199	.044		.214	.832	No

*Gend-M1 to M_i = Gender Model 1 to ith; Age-M1 to Mi = Age Model 1 to ith; WExp-M1 to M_i = Work Experience Model 1 to ith; VUse-M1 to M_i = voluntariness of use (proxied by students' preference) Model 1 to ith; PEBasITCap = Performance Expectancy - Students possess basic computer capabilities; PEModITCap = Performance Expectancy - Students possess moderate computer capabilities; PEAdvITCap = Performance Expectancy - Students possess advanced computer capabilities; PEITKNAcadPer = Performance Expectancy - Computer knowledge directly influences academic performance; PEITHelpMoodle = Performance Expectancy - No need for IT help in the use of Moodle or Mahara; PEMoodleIRR = Performance Expectancy - Moodle is irrelevant in achieving module's pass marks; EEEasyMoodLA = Effort Expectancy - Students can easily use Moodle or Mahara in learning activities; EEMin3hrsInt = Effort Expectancy - Students spend at least 3 hours on the internet in every 24 hours; EEMuchTmInt = Effort Expectancy - Students spend a lot of time on the internet; EEMoodMahdly = Effort Expectancy - Students use Moodle or Mahara on daily basis; EEMin3hrsMoodMah = Effort Expectancy - Students spend at least 3 hours on Moodle or Mahara daily; EEDislMoodMah = Effort Expectancy - Students do not like using Moodle or Mahara; EEEffLearnMoodMah = Effort Expectancy - Students always try to learn how to use Moodle or Mahara; EESocrAppEasy = Effort Expectancy - Socrative application; SINotUsdMoodMahPst = Social Influence - Students have never seen or used Moodle in the past; SIHelpCollonline = Social Influence - Students find it helpful to work with their colleagues online; SISeekAsstClassmAss = Social Influence - Students seek for the assistance of their classmates when submitting assignments on Moodle or Mahara; SIMentAsstMoodMah = Social Influence - Students have mentors that assist them in using Moodle or Mahara; SIPersLaptop = Social Influence - Students have personal laptops for their studies; SIMostClassLaptop = Social Influence - Most of the students' classmates have personal laptops for their studies; SIPartCommStaffStd = Social Influence - Students feel part of the community of staff and students; FCNotUsdMoodMahPst = Facilitating Conditions - Students have never seen or used Moodle in the past; FCHelpCollOnline = Facilitating Conditions - Students find it helpful to work with their colleagues online; FCSeekAsstClssmaMood = Facilitating Conditions - Students seek for the asisstance of their classmates when submitting assignments on Moodle or Mahara; FCPersTutAssITIssues = Facilitating Conditions - Personal tutors assist students in addressing IT issues; FCPartCommStaffStd = Facilitating Conditions - Students feel part of the community of staff and students; FCLibResAvailSuppLrn = Facilitating Conditions - Library resources are always available

to support students learning; FCMoodMahWellOrg = Facilitating Conditions - Moodle and Mahara sites are well-organised and work smoothly to support students' learning; FCCondLearnEnv = Facilitating Conditions - Learning environment can be described as very conducive for learning; FCSocAppHelp = Facilitating Conditions - Students find the use of Socrative Application in the class very helpful; BIContUsgITResLearn = Behavioural Intention - Students intend to continue using IT resources and facilities to support their learning process; BIEngInvITEnhLE = Behavioural Intention - Students are happy to engage with any invention in IT to enhance their learning experience; BINotEnvLmtITLA = Behavioural Intention - Students do not envisage limited use of IT in learning activities; BIAchLearnObjWtoutIT = Behavioural Intention - Students can achieve their learning objectives without IT or any online resources.

The results of the unified theory of acceptance and use of the technology model are presented in Table 6. In most cases, students' gender was insignificant in determining their behavioural intention towards the effective use of technology and the blended learning approach. There was also no evidence that gender determines the state of their performance expectancy, effort expectancy and social influence. However, we found a positive relationship between gender and student's perception of the relevance of using Moodle in achieving the module's pass mark.

We tested H04 to assess whether age group is a significant factor in the determination of behavioural intention, social influence, effort expectancy, performance expectancy and facilitating conditions towards the effective use of technology and blended learning approach. We found some evidence of a relationship between effort expectancy, performance expectancy and the perception of students on facilitating conditions. In effort expectancy, Moodle's easy use was determined by students' age group. The extent to which students tried to develop expertise in using Moodle was also by their age group. In performance expectancy, the possession of basic computer capabilities was determined by age group. We found a strong correlation between students' age and their perception of the relevance of facilitating conditions for effective use of technology and blended learning.

We tested the influence of students' work experience on their behavioural intention towards the effective use of technology and the blended learning approach. There was no evidence of a relationship except in collaborative learning and the usefulness of Socrative application. We found a positive relationship between students' work experience and their effort toward collaborative learning, and the acceptance of the importance of learning software applications such as Socrative (Ormerod et al., 2022; Tinnion et al., 2021). Based on H06, we found no evidence to suggest any relationship between students' voluntariness of use proxied by their preference and the effect of social influence on their behavioural intention towards the effective use of technology and blended learning.

The testing of H07, H08 and H09 was to assess whether performance expectancy, effort expectancy and social influence affect the students' behavioural intention towards the effective use of technology and blended learning. From the numerous sub-hypotheses tested, we found that most students possess basic computer capabilities and do not expect IT help in using Moodle to achieve learning objectives. Surprisingly, the sub-hypothesis of Moodle's irrelevance in achieving the module's pass mark (H07(iii)) was found to be significant. Students believe that learning objectives and pass mark can be achieved without using Moodle. We have not investigated further to find the factors behind this finding. Our results have also indicated the significance of having easy access to Moodle (H08 (i)); spending at least 3 hours on the internet in every 24 hours, using Moodle or Mahara daily, and the relevance of Socrative application in learning activities (H08 (ii)). Social influence was also found to affect students' behavioural intention towards effective blended learning contrary to findings of Erjavec and Manfreda (2022). If students have never seen or used Moodle in the past (H09 (iii)), they seek the assistance of their classmates to submit assignments on Moodle or Mahara. It has been discovered that many of the students have personal laptops and feel part of the community of staff and students (H09 (ii)). Students were also found to have mentors that assisted them in using Moodle and Mahara facilities.

We have also tested whether facilitating conditions such as a conducive learning environment and adequate library resources determine students' use of technology behaviour towards effective blended learning. The results of our analysis show that only the use of Moodle and the assistance offered to students by tutors in addressing IT issues are significant in the influence of their use of technology behaviour towards effective blended learning. However, students' enthusiasm to engage with any innovation in IT has been found to be relevant in determining the use of technology behaviour towards effective blended learning. We found no evidence to suggest that the state of the learning environment using proxies such as classroom layout and conducive atmosphere for learning dictates the success of the blended learning approach. Contrarily, the quality of instructional design in terms of the availability of library resources and the coordination of Moodle and Mahara are key factors for achieving positive students' experience through a blended learning approach. We also discovered that students from developing countries were not conversant with IT

facilities, and that affected the attainment of learning objectives (see also Adnan and Anwar, 2020; French et al.,2020; Burki, 2020).

6. Conclusion

Action research was undertaken to reassess the effectiveness of a blended learning approach among International MBA students. It was discovered that students were very engaged during traditional learning sessions without distractions from using phones or other IT gadgets. Most of the students from the European states seemed to be dissatisfied with the session. The critical issue for the students was observed to be the limited use of IT facilities in the session. Contrarily, most of the students from the African and Asian states were very satisfied with the traditional approach because of the absence of distraction from using personal phones or laptops. It was also discovered that students in higher education have different characteristics in terms of previous educational experiences, interests, expectations, and readiness for learning that determine the quality of their learning experiences. Students were satisfied with the blended learning approach adopted irrespective of their countries of origin. On the same note, students were very excited and engaged during the blended learning session. The results show a significant relationship between age and students' performance expectancy, effort expectancy and facilitating conditions. Although most respondents are within the age bracket of 20 to 29, we found evidence that the younger the students, the more important those factors will be in facilitating their effort to associate with technology for successful blended learning. It also indicates that students' engagement is determined by the positive learning experience. Specifically, a well-organized module structure and learning approach are the key factors responsible for the positive learning experience. Students' gender coefficients were found to be insignificant regarding performance, effort, social influence and other facilitating conditions that determine students' engagement with technology towards effective blended learning.

Areas of further research could be in assessing students' engagement and experience regarding alternative learning methods that could be incorporated into the blended learning approach. These learning methods include open discussions, self-learning

presentations and posters, storytelling, real-life case studies, guest lectures and game-based learning. It will also be meaningful to explore further the impact of students' economic, social, and cultural backgrounds on their learning achievements. The acceptability of different online learning resources and software applications among international students should be investigated.

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