



Students' Satisfaction Towards the Implementation of Blended Learning: A Case Study in UiTM Negeri Sembilan

Saliza Ramly¹, Sri Yusmawati Mohd Yunus¹, Rozianiwati Yusof¹, Normaziah Abdul Rahman¹, Nor Azlina Aziz Fadzillah¹, Shamsudin Md Sarif¹

¹Universiti Teknologi MARA Negeri Sembilan

sallyza@ns.uitm.edu.my, sriyusmawati@ns.uitm.edu.my, rozian696@ns.uitm.edu.my, maziah@ns.uitm.edu.my, norazlina@ns.uitm.edu.my, shamsudinms@ns.uitm.edu.my

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Abstract

Blended Learning (BL) is the way e-learning is being combined with traditional classroom methods. It is becoming a flexible and effective platform in teaching-learning environment especially in the higher-level institution. Universiti Teknologi MARA (UiTM) has launched its Learning Management System (LMS) to facilitate an online teaching and learning. BL was introduced in 2011 to several courses in UiTM. Currently, BL is commonly used as the method in teaching and learning in most of the UiTM courses. However, it is crucial in knowing whether this method is applicable and significant to students in process of teaching and learning in UiTM Negeri Sembilan. The purpose of this study is to identify the students' satisfaction towards the implementation of BL in UiTM Negeri Sembilan based on five satisfaction domains which are interaction, instruction, instructor, course managements and technology. This study covered two campuses in UiTM Negeri Sembilan which involve four faculties; Faculty of Computer and Mathematical Sciences (FSKM), Faculty of Sports and Recreation (FSR), Faculty of Applied Science (FSG) and Faculty of Administrative Science and Policy Studies (FSPPP). Data was gathered through an online survey distributed to students. Multiple Linear Regression and Multivariate Analysis of Variance (MANOVA) were used to further analyse the data. Based on result, it shows that students had satisfied with the implementation of BL.

INTRODUCTION

Universiti Teknologi MARA (UiTM) has officially launched its Learning Management System (LMS) called i-Learn portal in December 2005. At the beginning, i-Learn portal acts as a medium to support teaching and learning processes in UiTM. It is a convenient way to communicate between lecturers and students other than just a face-to-face communication in a formal class. In 2011, Blended Learning (BL) was introduced involving lecturers and students from all over UiTM in Malaysia. i-Learn portal has become an official LMS to support BL in UiTM.

UiTM Negeri Sembilan is one of the UiTM branch that used BL as the method of teaching and learning. A study conducted by Isnania Z.M. et al. (2015) showed that lecturers have implemented BL method in UiTM Negeri Sembilan because they believed the factors of students' understanding, system applications and materials play important roles in the effective process of teaching and learning. Lecturers also have been given training in

many Web 2.0 tools in order to help them preparing materials for online learning. Ramly S. et al. (2016) have investigated the usefulness of BL in UiTM Negeri Sembilan. Based on the study, 82.14% lecturers preferred to implement BL. It is confirmed that the BL method is very useful because the lecturers have the facilities and skills to support BL.

The rapid development of technology has led to the succession of BL. Nowadays, students are preferred to use technology in their process of learning. Study done by Taib J.M., Ramly S., Ramli R. (2016) revealed that students often use web services that support learning activities to communication with lecturers and friends. There are several web services has been used by students in UiTM Negeri Sembilan to communicate such as Whatsapp, i-Learn portal, facebook, and email. However, i-Learn portal as official LMS remains an important platform to support BL in UiTM. It is also considered as the private cloud computing which allows lecturers for distributing of course content, communication, collaboration, content management and assessment. There are several features in i-Learn portal that helps to support BL in UiTM such as course content, course forum, online assessment, assignment, chat, and video. These features are important to support the interaction between lecturers and students.

LITERATURE REVIEW

Blended Learning (BL) has been introduced since 1990. According to Owston et al. (2013), BL is a process of online learning that is a part of the formal teaching and learning in class which is combines e-learning and traditional face-to-face learning. According to Afip (2014), BL is defined as a learning process that combines methods of teaching, delivery, media structures or the inclusion of all methods in one process. BL has been improvised to increase the communication between students and lecturers inside and outside the classroom. Nowadays, BL also involves learning tools to help student to understand about the course that they took better. These tools have helped students to do more exercises online and also have helped them give better responds to the lecturers. Furthermore, students learn to adapt with BL since they can get access to the internet through their smartphone.

Recently, BL techniques become more widely employed in this learning model, learners not only can access the learning material but also they be able to communicate with both lecturers and other students in a distant mode. In the learning paradigm that focuses on combining and optimizing both conventional and e-learning advantages and potentials while terminating both learning models challenges and shortages, is often apply the term blended (Kintu, et. al.).

BL was introduced in 2011 to several courses in UiTM. Currently, BL is commonly used as the method in teaching and learning in most of the UiTM courses. BL in UiTM refers to integrating the face to face as traditional learning and the e-learning courses through Learning Management System (LMS) to achieve more efficient teaching and learning process. Thus, to solve the problems of time and room constraint in UiTM. Based on Sary & Tsuyoshi (2017), BL in developed countries are more common than similar studies in developing countries, especially about students' performance and preference in learning. Moreover, one of the most important issues in BL is how satisfy this approach towards students and lecturers.

A study conducted by Ramly S. et. al (2016) showed that lecturers agreed that BL helped in solving the insufficient classroom and time to meet the students in UiTM Negeri Sembilan. In UiTM Negeri Sembilan, there are numbers of courses that have been blended as noted in course syllabus. The lecture time for face to face (in classroom) and non-face to face (online learning) is scheduled properly to make sure BL run smoothly. This approach has given the solution to the constraint of time and venue.

Since BL has already been introduced in UiTM Negeri Sembilan, it is important to know whether this method is applicable and significant to students in process of teaching and learning in UiTM Negeri Sembilan. This study will be focused on how effective the BL in satisfied the students from the perspective of student satisfaction based on five elements which are interaction, instruction, instructor, course managements and technology. The selected elements are as a result of the past researches and the researcher's experience at UiTM Negeri Sembilan.

Interaction

BL has been a helpful 'tool' to support both teaching and learning because this method can be used to allow students to interact using technologies, not only can they cooperate in formal classes but can also be useful outside the classroom. For example, through BL students can have discussions, and also ask questions to their lecturers if they do not understand about a certain topic. BL also allows students to communicate and do the assignments given, during and after formal class sessions depending on the task given by the lecturers for each course.

According to Akkoyunlu and Soylu (2008), BL was delivered through combining web-based and traditional learning. Interaction commonly happened through face to face, however, the web based approached also efficient in conducting the interaction between students with lecturers and students with other students. The web-based was used to download exercises and assignments, however with the improvement of web technology enable interaction between other users. For example, forum for discussion. The forum helped to increase students' interaction with other students and lecturers. In this forum, lecturers also helped in answering and responding to students' questions and also evaluate the students' performances in the process of BL. Students' interaction and communication are not limited only in formal classes because BL process requires both students and lecturers to communicate well in order to accomplish the given tasks. The implementation of BL system has provided lecturers and students with educational technologies, more flexible instructional methods, and various learning sources practiced in an interactive learning environment which have helped to reduce the limitations of classroom and limited time in a formal class (Shmais & Adas, 2011).

Instruction

Instruction is another domain that is supposed to use to measure the students' satisfaction towards the implementation of BL. There are many differences between BL instructions and traditional instructions. However, each type of learning has its own advantages and disadvantages. It is important to investigate the effectiveness of BL instruction in terms of students' satisfaction (Giannousi M. et al., 2009). From the past researches, BL instructions is more efficient than tradition instructions although it requires extra time and effort to create the instruction.

By implementing BL instruction, all assessments, course content and resources are available on and via online. It can be the medium where the lecturer can perform some discussion besides being a place to post notes, and references with active links as a class activity and assessment to make fully utilize the discussion and reducing face-to-face confrontation. In addition, Hung and Chou, (2015) noted that that system satisfaction and multimedia instruction could positively not only instructors but also to students' attitude toward and enjoyment of BL. However, according to Naaj, Nachouki, and Ankit (2012), feedbacks given by the instructor is the most important aspect in students' satisfaction with the instruction. BL approached gives advantages since it combined face-to-face interaction and web-based interaction which lecturers mostly give instruction in class, the implementation of BL helped in terms of giving instructions because not only the lecturers are able to give away tasks and assignments in class, the lecturers can also give instruction outside the formal class session. Besides that, according to Harandi (2015), with the advancement of technology used, instruction had been made more interesting for the students since it can be delivered in different media such as video, audio and text. The instruction can be more clear delivered and understood by the students easily.

Instructor

Another important domain to measure students' satisfaction towards implementation of BL is the instructor. Level of guidance of the instructor towards students will be considered in rating their satisfaction. Research done by So and Brush (2008) has explained in detail where the evaluation will be based on how the instructor delivers the content knowledge, provides appropriate scaffolding, clarifies misunderstanding, and increase students' motivation. They said that the instructors' modelling and scaffolding of social presence behavior is important because it might be needed for students who are distance learners.

Instructors and instructional designers play a key role since they are the ones who are responsible as to where they have to invest more time and effort on the analysis of learners, learning contents, contexts, and technologies to design an effective BL course. By using BL many activities can be done by the instructors for example like live chat session, online discussions, forums, quizzes, and assignments and with these kind of systems, instructional delivery and communication between instructors and students can be performed at the same time (synchronously) or at different times (asynchronously). Wu, Tennyson and Hsia (2010) found that this system can provide instructors and students with multiple, flexible instructional methods, and educational technologies.

However, instructors should also provide sufficient incentives and administrative support to encourage students to actively participate in BL courses and to ensure computer literacy between all students in order to utilize all the technology used in communicate with the instructors. Besides that, they also should cultivate a positive interaction publicly to increase participant communication and collaboration learning via the system (Wu, Tennyson, & Hsia, 2010). In addition, instructors need to deal with the large numbers of students which is difficult for them to spend more time and effort to follow up with all students from every class (Shaqour, 2014).

Course Managements

Blended e-learning system use different methods such as tutorials and online discussions as a platform for sharing and delivering course content (So & Brush, 2008). Wu, Tennyson and Hsia (2010) suggested that blended e-learning system should consider a relevant system and content element that include multimedia presentation and flexibility. Besides, good class management gives high satisfaction in BL (Naaj, Nachouki, & Ankit, 2012). There are many other systems or resources that are available in BL environment such as e-mail, live chat sessions, online discussions, forums, quizzes and assignments. These systems provide good communication between students and instructors even though they are afar (Pituch & Lee, 2006).

Technology

Technology also contributes to the student's satisfaction towards BL. Smart and Cappel (2006) found that the more experience students have with technology, the more positive they are towards BL. Technology is one of the factors in BLES environment that contributes to the student's satisfaction towards BL (Wu et al., 2008). Furthermore, good experience with technology also leads to higher level of user's satisfaction in BL (Simmers & Anandarajan, 2001; Volery & Lord, 2000). The use of technology has brought a positive impact on the BL environment (Taradi K. et al., 2005). Problems with technology weaken the course management system (Giannousi M. et al., 2009). Besides, Popovici and Mironov (2015) stated that students were aware of the changes brought by technology and they implement technology to support their learning process.

METHODOLOGY

The study of student satisfaction towards the implementation of BL measured the five elements which are interaction, instruction, instructor, course managements and technology. This study focusses on i-Learn portal as official LMS. This study covered two campuses in UiTM Negeri Sembilan; Seremban and Kuala Pilah campuses which involve four faculties; Faculty of Computer and Mathematical Sciences (FSKM), Faculty of Sports and Recreation (FSR), Faculty of Applied Science (FSG) and Faculty of Administrative Science and Policy Studies (FSPPP). The study also includes students diploma and degree level.

Research Instrument

Data was gathered through questionnaire online survey distributed among all students in UiTM Negeri Sembilan. The questionnaire was divided into seven sections. In Section A, the demographic profile was asked based on required information which are gender, age, type of faculty, type of program, semester, and time spend using BL (in a month). Section B, C, D, E and F asks the questions on the five domains which are interaction, instruction, instructor, course management and technology respectively. In these five sections, the students were required to answer based on a 5-point Likert Scale, ranging from 1= Strongly Disagree until 5= Strongly Agree. And the last section which is section G are questions about the students' suggestion on BL and the student's overall satisfaction towards the implementation of BL. For the overall satisfaction, students were required to answer based on a 10-point Likert Scale, ranging from 1=Very Dissatisfied to 10=Very Satisfied.

Research Population

The respondents in this study were the students from UiTM Negeri Sembilan. There are two campuses in UiTM Negeri Sembilan, which are UiTM Seremban 3 campus and UiTM Kuala Pilah campus. The figure 1 shows the number of students both in bachelor's degree and diploma from four faculties; Faculty of Science Computer and Mathematics (FSKM), Faculty of Sports Science and Recreation (FSR), Faculty of Administrative Science and Policy Studies (FSPPP) and Faculty of Applied Science (FSG). The size of the sample of the study can determine the level of variability in the population itself. Based on the rule of thumb from Roscoe (1975), sample size that is more than 30 respondents will be appropriate especially in conducting inferential analysis or else also known as statistical analysis to achieve certain objectives.

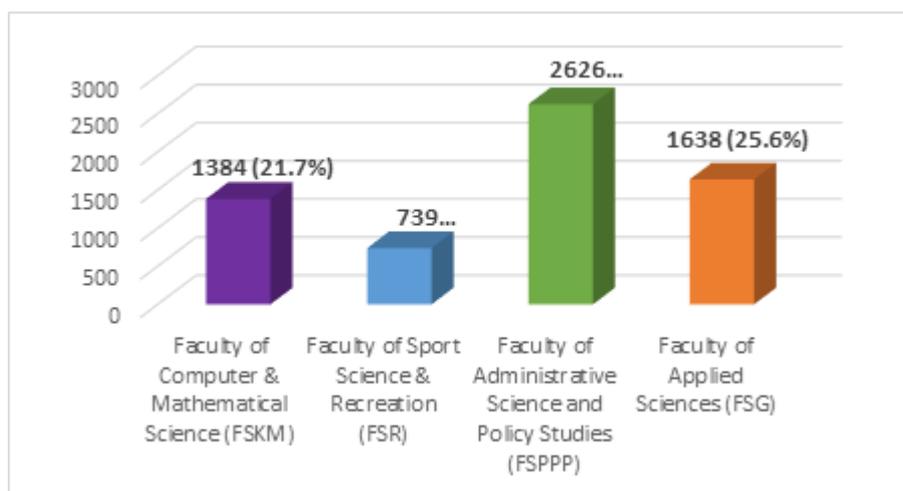


Fig. 1.
Population of Students in UiTM Negeri Sembilan

Data Analysis

This study used two types of data analysis which are descriptive analysis and inferential analysis. Inferential analysis is used when statistical technique is applied in the research. There are two types of inferential analysis used in this study which are multiple linear regression (MLR) analysis and multivariate analysis of variance (MANOVA).

However, the reliability test under scale measurement should be done to determine the reliability of the survey forms. Coefficient Alpha or Cronbach's Alpha was used to measure the concept of consistency reliability. The coefficient varies from 0 to 1. The level of internal consistency of Cronbach's alpha value is acceptable within 0.5 to 0.7 and shows a good level if it is more than 0.7 (Nunnally and Bernstein, 1994; Streiner and Norman, 2008).

Meanwhile, descriptive analysis involves the transformation of raw data into a form that could provide information to describe a set of factors in a situation. To perform descriptive analysis, the demographic profiles were obtained which includes gender, education levels, types of faculty, time spend using BL (spending in a month).

Multiple Linear Regression Analysis

Hair et al. (2010) stated that a multiple linear regression analysis is a statistical technique that can be used to analyze the relationship between a single dependent (criterion) variable and several independent variable (predictor) variables. In this study, the dependancy between interaction, instruction, instructor, course management and technology with the students' satisfaction has been determined towards the implementation of BL. Each independent variable was weighted by the regression analysis procedure to ensure the maximum prediction from the set of predictor variables.

Multivariate Analysis of Variance (MANOVA)

Multivariate analysis of variance (MANOVA) is an extension of analysis of variance when study consists of more than one dependent variable (Grimm and Yarnold, 1995). For this case, the comparison of students' satisfaction domains has been done which it involves student from different faculties. The process of MANOVA starts with a focus on the categorical groups and determines how means of several dependent variables differ (Harlow and Duerr, 2013). According to Johnson and Wichern (2007), the statistical model for multivariate analysis of variance is:

where μ are independent N_p (0,) variables
 μ is an overall mean (level)
 μ_j represents the j th treatment effects with $\mu_j = 0$

RESULT AND DISCUSSION

In this study, 245 students of UiTM Negeri Sembilan which is 62 students (25.3%) taking diploma and 183 students (74.7%) taking bachelor's degree. It consists of 66 male students (26.9%) and 179 female students (73.1%). There are 77 students (31.4%) from Faculty of Computer Science and Mathematics (FSKM), 71 students (29.0%) from Faculty of Sport Science and Recreation (FSR), 58 students (23.7%) from Faculty of

Administrative Science and Policy Studies (FSPPP), 39 students (15.9%) from Faculty of Applied Sciences (FSG).

In a month of studies, there are 142 students (58.0%) spend in range of one to three times using BL and 63 students (25.7%) spend time in a range of four to six times. Furthermore, it shows that 40 students (16.3%) in UiTM Negeri Sembilan uses BL in a range of seven and above in a month. There are two statistical techniques used in this study which are Multiple Linear Regression and Multivariate Analysis of Variance (MANOVA).

In the questionnaire, five sections represent for five domains which are interaction, instruction, instructor, course management and technology respectively (Appendix). As can be seen in the summarized table 1, Interaction 6 has the highest mean score which is 3.46. This indicates that students are satisfied with their participation in the class during BL session. In the instruction section, Instruction 1 has the highest mean score which is 3.72. This indicates that students are satisfied with the use of BL technology in this course that encourages them to learn independently. In Instructor section, Instructor 6 has the highest mean score which is 3.72. This indicates that students are satisfied with the amount of time given by the instructor (lecturer) to complete the given assignments. In terms of course management, Course Management 2 has the highest mean score which is 4.01. This indicates that students are satisfied when their lecturer/supervisor always takes attendance. In terms of technology, Technology 5 has the highest mean score which is 3.67. This indicates that students are satisfied with technology is a faster and better access to information.

TABLE 1
THE HIGHEST MEAN OF FIVE SATISFACTION DOMAINS

| Satisfaction Domains | Mean |
|----------------------|------|
| Interaction 6 | 3.46 |
| Instruction 1 | 3.72 |
| Instructor 6 | 3.72 |
| Course Management 2 | 4.01 |
| Technology 5 | 3.67 |

The calculation of mean score obtained from this study explained all the dimensions that needed to be investigated. Compute mean analysis which comes with the SPSS was used to locate the mean score of the level of students' satisfaction towards the implementation of BL.

Multiple Linear Regression (MLR)

MLR is used to define the significant relationship between satisfaction domains and the students' satisfaction towards implementation of BL. Before conducting MLR, there are some major assumptions that need to be fulfilled in order to continue with the analysis.

- i. Assumptions of Multiple Linear Regression Analysis
 - i) Normality of the error term distributions
 - ii) Linearity of the relationship between independent variables and the dependent variables.
 - iii) Constant variance of the error terms (Homoscedasticity)
 - iv) Independence of the error terms (Autocorrelation)
- ii. Significance of the overall model: Testing the coefficient of determination

TABLE 2
R VALUE, R SQUARE AND STANDARD ERROR OF THE ESTIMATE

| R | R Square | Standard Error of the Estimate |
|-------|----------|--------------------------------|
| 0.964 | 0.930 | 0.296 |

From the table 2, it shows the value of R Square which is 0.930, it can be concluded that there is 93.0% of the students' satisfaction in implementation of BL is explained by the five satisfaction domains and the balance of 7.0% is explained by other factors. The R value is 0.964 which indicates that there is a strong positive linear relationship between the five satisfaction domains with the students' satisfaction towards the implementation of BL. Therefore, the test of significance of the model is conducted to determine the overall fit of the model.

TABLE 3
F-VALUE AND SIGNIFICANT VALUE

| F | Significant Value |
|---------|-------------------|
| 632.116 | 0.000 |

From the table 3, since the significant value is 0.000 is less than $\alpha = 0.01$, the model is said to be a good fit for the data.

iii. Significance test of regression coefficients

Since the model is a good fit for the data, each satisfaction domain is used to test whether it is significant in explaining the students' satisfaction towards the implementation of BL. From the test, all the satisfaction domains (interaction score, instruction score, instructor score, course management score and technology score) are significant explaining the students' satisfaction since all the p-values are 0.000 and it is less than $\alpha = 0.01$.

iv. The regression coefficients

TABLE 4
REGRESSION COEFFICIENT OF INDEPENDENT VARIABLES

| Model | Coefficients |
|-------------------------|--------------|
| Constant | 0.047 |
| Interaction Score | 0.071 |
| Instruction Score | 0.066 |
| Instructor Score | 0.074 |
| Course Management Score | 0.065 |
| Technology Score | 0.066 |

From the table 4, the estimated regression equation obtained is:

$$\hat{Y} = 0.074 + 0.071 X_1 + 0.066 X_2 + 0.074 X_3 + 0.065 X_4 + 0.066 X_5$$

Where:

Y : Students' Satisfaction Towards Implementation of BL

X_1 : Interaction Score

X_2 : Instruction Score

X_3 : Instructor Score

X_4 : Course Management Score

X_5 : Technology Score

In terms of interaction score, it can be said that for every 1 unit increase of interaction score, students' satisfaction towards implementation of BL will be increased by 0.071. Other factors are assumed to be fixed. In terms of instruction score, it can be said that for every 1 unit increase of instruction score, students' satisfaction towards implementation of BL will be increased by 0.066. Other factors are assumed to be fixed. In terms of instructor score, it can be said that for every 1 unit increase of instructor score, students' satisfaction towards implementation of BL will be increased by 0.074. Other factors are assumed to be fixed. In terms of course management score, it can be said that for every 1 unit increase of course management score, students' satisfaction towards implementation of BL will be increased by 0.065. Other factors are assumed to be fixed. In terms of technology score, it can be said that for every 1 unit increase of technology score, students' satisfaction towards implementation of BL will be increased by 0.066. Other factors are assumed to be fixed.

Multivariate Analysis of Variance (MANOVA)

MANOVA was performed to identify if there is a significant difference between students' satisfaction domains among faculties in UiTM Negeri Sembilan towards the implementation of BL. The dependent variables are interaction scores, instruction scores, instructor scores, course management scores and technology scores. The groups used to compare the difference in the mean scores between groups are faculties in UiTM Negeri Sembilan. Before conducting the analysis, two major assumptions needed to be fulfilled which are normality and homogeneity of variance-covariance matrices.

i. Assumptions of MANOVA

i) Normality Checking

To fulfil one of the assumptions of multivariate normality in MANOVA, the researchers have checked both univariate normality and multivariate normality. For univariate normality, Normal

Q-Q plot for each dependent variable was constructed to make sure this assumption was not violated. From the Normal Q-Q plot for each satisfaction domain, the points are plotted approximately on the straight line. This indicates that the scores for each dependent variable is reasonably normally distributed (Table 5).

TABLE 5
MAHALANOBIS DISTANCE

| Distance | Minimum | Maximum |
|----------------------|---------|---------|
| Mahalanobis Distance | 0.497 | 31.374 |

To check the multivariate normality, Mahalanobis distances was produced and compared against the critical value obtained from the chi-square critical value table (Table 6). The comparison was made between the maximum value of Mahalanobis distance (31.374) and the critical value (15.0863) with 5 number of dependent variables as the degree of freedom (df), and alpha level of 0.01. Since the maximum value of Mahalanobis distance is greater than the critical value, suggesting the presence of multivariate outliers.

TABLE 6
CHI-SQUARE VALUE

| Number of Dependent Variables | Critical Value |
|-------------------------------|----------------|
| 5 | 15.0863 |

ii) Homogeneity of Variance-Covariance Matrices

Since the data is reasonably multivariate normally distributed, the researcher continues to test for the second assumption in MANOVA, which is equality of covariance matrices. Box's Test of equality of covariance matrices was conducted to see whether the data violates the assumption of homogeneity of variance-covariance matrices (Table 7).

TABLE 7
BOX'S TEST OF EQUALITY OF COVARIANCE MATRICES

| | Value |
|-------------------|--------|
| Box's M | 71.989 |
| F | 1.533 |
| Significant Value | 0.012 |

From the significant value of Box's M, it shows that 0.012 is approximately equal to the alpha level of 0.01 suggesting that the assumption of equality of covariance matrices is not violated. It can be concluded that the covariance matrices of the four faculties in UiTM Negeri Sembilan are the same. Based on the multivariate normality and equality of covariance matrices, both assumptions are not violated. Therefore, the researcher continued with multivariate analysis of variance (MANOVA).

ii. Multivariate Test

For the multivariate test, the researcher used Wilk's Lambda to test whether there are statistically significant differences among four faculties in UiTM Negeri Sembilan on the satisfaction domains (interaction scores, instruction scores, instructor scores, course management scores, and technology scores).

TABLE 8
MULTIVARIATE TEST

| Effect | Statistic | Value | F | Significant Value |
|---------|---------------|-------|-------|-------------------|
| Faculty | Wilk's Lambda | 0.843 | 2.999 | 0.001 |

From the table 8, the value of Wilk's Lambda is 0.843, with the significant value of 0.001 which is less than alpha level of 0.01. Therefore, there is a significant difference on the satisfaction domains among faculties in UiTM Negeri Sembilan towards the implementation of BL. However, this result does not show which satisfaction domain is having statistically significant different for the mean scores among four faculties in UiTM Negeri Sembilan.

To analyse the result, the researcher will compare the mean scores for all faculties according to each satisfaction domain. This will show that for each satisfaction domain, which faculty significantly differs in the mean scores for their satisfactions towards the implementation of BL. This is done by looking at the significant value and comparing them with an alpha level of 0.01. If the significant value is less than an alpha level of 0.01, it indicates that there is a significant difference for the mean scores of the dependent variables between FSKM, FSR, FSG, and FSPPP.

TABLE 9
PAIRWISE COMPARISON OF STUDENTS' INTERACTION SCORE

| Faculty (I) | Faculty (J) | Mean Difference (I-J) | Significant Value |
|-------------|-------------|-----------------------|-------------------|
| FSKM | FSR | -1.077 | 0.572 |
| | FSPPP | 2.091 | 0.016 |
| | FSG | 0.189 | 1.000 |
| FSR | FSKM | 1.077 | 0.572 |
| | FSPPP | 3.168 | 0.000 |
| | FSG | 1.266 | 0.621 |
| FSPPP | FSKM | -2.091 | 0.016 |
| | FSR | -3.168 | 0.000 |
| | FSG | -1.902 | 0.122 |
| FSG | FSKM | -0.189 | 1.000 |
| | FSR | -1.266 | 0.621 |
| | FSPPP | 1.902 | 0.122 |

From the table 9, only FSR and FSPPP shows significant difference in the interaction scores with significant value, 0.000 which is less than alpha level of 0.01. This result shows that, for interaction scores for students' satisfaction towards implementation of BL, only FSR is significantly different in the mean scores with FSPPP. The mean scores for FSR is 3.168 higher than FSPPP. This stated that students in FSR are more satisfy with the interaction in BL compared to students in FSPPP. However, there is no significant difference in the mean scores of interaction between students in FSKM with FSR, FSPPP, and FSG. It also shows that there is no significant difference in the mean scores of interaction between students in FSG with FSR and FSPPP. The student's mean scores of interaction between these three faculties are equal.

TABLE 10
PAIRWISE COMPARISON OF STUDENTS' INSTRUCTION SCORE

| Faculty (I) | Faculty (J) | Mean Difference (I-J) | Significant Value |
|-------------|-------------|-----------------------|-------------------|
| FSKM | FSR | -0.918 | 0.779 |
| | FSPPP | 1.855 | 0.027 |
| | FSG | 0.174 | 1.000 |
| FSR | FSKM | 0.918 | 0.779 |
| | FSPPP | 2.773 | 0.000 |
| | FSG | 1.092 | 0.807 |
| FSPPP | FSKM | -1.855 | 0.027 |
| | FSR | -2.773 | 0.000 |
| | FSG | -1.618 | 0.173 |
| FSG | FSKM | -0.174 | 1.000 |
| | FSR | -1.092 | 0.807 |
| | FSPPP | 1.618 | 0.173 |

From the table 10, only FSR and FSPPP show a significant difference in the instruction scores with the significant value 0.000 which is less than alpha level of 0.01. In this result, it shows that there is a significant difference in the mean scores of instruction between FSR and FSPPP. The mean instruction scores for FSR is 2.773 higher than FSPPP. This stated that students in FSR are more satisfied with the instruction in BL compared to students in FSPPP. However, there is no significant difference in the mean scores of instruction between students in FSKM with FSR, FSPPP, and FSG. It also shows that there is no significant difference in the mean scores of instruction between students in FSG with FSR and FSPPP. The student's mean scores of instruction between these three faculties are equal.

TABLE 11
PAIRWISE COMPARISON OF STUDENTS' INSTRUCTOR SCORE

| Faculty (I) | Faculty (J) | Mean Difference (I-J) | Significant Value |
|-------------|-------------|-----------------------|-------------------|
| FSKM | FSR | -0.060 | 1.000 |
| | FSPPP | 2.078 | 0.001 |
| | FSG | 0.621 | 1.000 |
| FSR | FSKM | 0.060 | 1.000 |

| | | | |
|--------------|-------|--------|-------|
| | FSPPP | 2.138 | 0.001 |
| | FSG | 0.682 | 1.000 |
| FSPPP | FSKM | -2.078 | 0.001 |
| | FSR | -2.138 | 0.001 |
| | FSG | -1.456 | 0.165 |
| FSG | FSKM | -0.621 | 1.000 |
| | FSR | -0.682 | 1.000 |
| | FSPPP | 1.456 | 0.165 |

From the table 11, there is a significant difference between FSKM and FSPPP in terms of mean instructor scores with a significant value 0.001 which is less than alpha value 0.01. There is also a significant difference between FSR and FSPPP in terms of instructor scores with significant value 0.001 which is less than alpha value 0.01. For FSKM students, the mean instructor score is 2.078 higher than FSPPP students. This stated that students in FSKM are more satisfied with the instructor in BL compared to students in FSPPP. Besides that, the mean instructor scores for FSR is 2.138 higher than FSPPP students which also means that FSR students are more satisfy with the instructor in BL environment. However, there is no significant difference in the mean instructor scores for students in FSG and FSPPP. It shows that both FSG and FSPPP students obtained equal mean scores for instructor in BL environment.

TABLE 12
PAIRWISE COMPARISON OF STUDENTS' COURSE MANAGEMENT SCORE

| Faculty (I) | Faculty (J) | Mean Difference (I-J) | Significant Value |
|--------------|-------------|-----------------------|-------------------|
| FSKM | FSR | -0.678 | 0.991 |
| | FSPPP | 1.984 | 0.001 |
| | FSG | -0.428 | 1.000 |
| FSR | FSKM | 0.678 | 0.991 |
| | FSPPP | 2.662 | 0.000 |
| | FSG | 0.250 | 1.000 |
| FSPPP | FSKM | -1.984 | 0.001 |
| | FSR | -2.662 | 0.000 |
| | FSG | -2.412 | 0.001 |
| FSG | FSKM | 0.428 | 1.000 |
| | FSR | -0.250 | 1.000 |
| | FSPPP | 2.412 | 0.001 |

From the table 12, there is significant difference between FSKM and FSPPP in terms of Course Management scores with significant value 0.001 which is less than alpha value 0.01. Moreover, there is a significant difference between FSR and FSPPP with significant value 0.000 which is less than alpha value 0.01. There is also a significant difference between FSG and FSPPP in terms of Course Management scores with significant value 0.001 which is less than alpha value 0.01. The mean course management scores for FSKM students is 1.984 higher than FSPPP students. Meanwhile, the mean course management scores for FSR students are 2.662 higher than FSPPP students. From the results, it also shows that the mean course management scores for students in FSG is 2.412 higher than FSPPP. Therefore, the students in FSKM, FSR and FSG are more satisfy with implementation of BL in terms of course management compared to FSPPP. Moreover, the result shows that there is no significant difference in the mean course management scores for students in FSKM, FSR and FSG.

TABLE 13
PAIRWISE COMPARISON OF STUDENTS' TECHNOLOGY SCORE

| Faculty (I) | Faculty (J) | Mean Difference (I-J) | Significant Value |
|--------------|-------------|-----------------------|-------------------|
| FSKM | FSR | -0.171 | 1.000 |
| | FSPPP | 2.167 | 0.000 |
| | FSG | 0.079 | 1.000 |
| FSR | FSKM | 0.171 | 1.000 |
| | FSPPP | 2.338 | 0.000 |
| | FSG | 0.250 | 1.000 |
| FSPPP | FSKM | -2.167 | 0.000 |
| | FSR | -2.338 | 0.000 |
| | FSG | -2.008 | 0.007 |
| FSG | FSKM | -0.079 | 1.000 |
| | FSR | -0.250 | 1.000 |
| | FSPPP | 2.088 | 0.007 |

From the table 13, there is a significant difference between FSKM and FSPPP, FSR and FSPPP in terms of Technology scores with significant value 0.000 which is less than alpha value 0.01. There is also a significant difference between FSG and FSPPP in terms of Technology scores with a significant value of 0.001 which is less than the alpha value 0.01. The mean technology scores for students in FSKM are 2.167 higher than FSPPP which indicates that the students in FSKM are more satisfy with the technology used in BL compared to FSPPP. From this result, it also shows that FSR students are more satisfied with technology used in BL compared to FSPPP (2.338 higher than FSPPP) and students in FSG have higher mean technology scores (2.088) than FSPPP. For the mean technology scores between FSKM, FSR and FSG, there is no significant difference which indicates that the students' satisfaction scores in terms of technology used in BL are the same for the three faculties.

CONCLUSION AND FUTURE WORK

The study examined the students' satisfaction towards the implementation of BL in UiTM Negeri Sembilan. There are five domains have been used to shows students' satisfaction which includes interaction, instruction, instructor, course management and technology. Based on the results, it shows that, students are satisfied with the quality of interaction and instruction used by the lecturers to conduct BL session. They agreed that certain courses offered in BL session together with traditional learning method can improve teaching and learning method in UiTM Negeri Sembilan. However, based on previous study by Naaj (2012), even though the students were satisfied with the implementation of BL, yet they still preferred conventional learning. Moreover, the student's satisfaction towards the implementation of BL are different among the faculties in UiTM Negeri Sembilan. For interaction and instruction, the result shows that only students in FSR and FSPPP differ in terms of their satisfaction towards implementation of BL, while students in FSKM have the same satisfaction towards the implementation of BL with FSR, FSG and FSPPP. Furthermore, students in FSKM and FSR are more satisfied with the implementation of BL in terms of instructor compared to FSPPP students. In addition, students in FSKM, FSR and FSG are more satisfied in terms of course management and technology compared to FSPPP. In conclusion, among the four faculties in UiTM Negeri Sembilan, only FSPPP students differ for their satisfaction towards the implementation of BL with the other faculties in the mean scores for interaction, instruction, instructor, course management and technology.

BL is commonly used in education especially in higher level of education. Further research is needed to improve the use of BL in higher education towards students' satisfaction. Therefore, more sample data are required for each faculty to represent the whole population in UiTM Negeri Sembilan. Besides five domains, other factors should be considered to measure the students' satisfaction towards BL. In addition, sample students' data can be collected from other campuses or universities in Malaysia. In future work, it is recommended to compare BL with traditional learning among students and to focus on the preferable types of BL for certain courses.

REFERENCES

- Afip, L. B. A. (2014). Motivating adult learners using blended learning in higher education institution. *Researchers World*, 5(3), 35.
- Akkoyunlu, B., & Yilmaz-Soylu, M. (2008). A Study of Student's Perceptions in a Blended Learning Environment Based on Different Learning Styles. *Educational Technology & Society*, 11(1), 183-193.
- Giannousi, M., Vernadakis, N., Derri, V., Michalopoulos, M., & Kioumourtzoglou, E. (2009). Students' satisfaction from blended learning instruction. In *Proc. Technology, Colleges, and Community (TCC) Worldwide Online Conference* (pp. 61-69).
- Harandi, S. R. (2015). Effects of e-learning on Students' Motivation. *Procedia-Social and Behavioral Sciences*, 181, 423-430.
- Hung, M. L., & Chou, C. (2015). Students' perceptions of instructors' roles in blended and online learning environments: A comparative study. *Computers & Education*, 81, 315-325.
- Isnania Z.M., Ramly S., S.Y.M., Jamil N.I., Tuan Ahmad T.S.A.S. (2015) The Usefulness of I-Learn System in the Execution of e-Learning: A Case Study of UiTM Negeri Sembilan. *Proceeding: 1st International Conference on Teaching & Learning (ICTL 2015) 14-15 September 2015, Langkawi, Malaysia*.
- Kintu, M.J. Zhu, C., Kagambe, E. (2017). Blended Learning Effectiveness: The Relationship Between Student Characteristics, Design Features and Outcomes. *International Journal of Educational Technology in Higher Education*, 14 (7).
- Naaj, M. A., Nachouki, M., & Ankit, A. (2012). Evaluating student satisfaction with blended learning in a gender-segregated environment. *Journal of Information Technology Education: Research*, 11(1), 185-200.
- Owston, R., York, D., & Murtha, S. (2013). Student perceptions and achievement in a university blended learning strategic initiative. *The Internet and Higher Education*, 18, 38-46.

Pituch, K. A., & Lee, Y. K. (2006). The influence of system characteristics on e-learning use. *Computers & Education*, 47(2), 222-244.

Ramly S., Yunos S.Y., Ahmad T.S.A.S., Jamil N.I. (2016) Investigating the Usefulness of Blended Learning: A Case of UiTM Negeri Sembilan. In: Luaran J., Sardi J., Aziz A., Alias N. (eds) *Envisioning the Future of Online Learning*. Springer, Singapore

Sary, P., Tsuyoshi, U. (2016). A Study of Student Toward Blended Learning Implementation in Higher Education Institution in Indonesia. *International Conference On Information, Communication and Technology*. IEEE, 220-225

Shaqour, A. Z. (2014). Faculty members' views towards blended learning: Case of a Najah National University master program Teachers in the College of Education and Teacher Preparation. *International Journal of Humanities and Social Science*, 4(7), 99-106.

Shmais, W. A., & Adas, D. (2011). Students' perceptions towards blended learning environment using the OCC.

Simmers, C. A., & Anandarajan, M. (2001). User satisfaction in the Internet-anchored workplace: An exploratory study. *JITTA: Journal of Information Technology Theory and Application*, 3(5), 39.

Smart, K. L., & Cappel, J. J. (2006). Students' perceptions of online learning: A comparative study. *Journal of Information Technology Education*, 5(1), 20119.

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.

Taradi, S. K., Taradi, M., Radić, K., & Pokrajac, N. (2005). Blending problem-based learning with Web technology positively impacts student learning outcomes in acid-base physiology. *Advances in physiology education*, 29(1), 35-39.

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.

Wu, J. H., Tennyson, R. D., Hsia, T. L., & Liao, Y. W. (2008). Analysis of e-learning innovation and core capability using a hypercube model. *Computers in Human Behavior*, 24, 1851–1866.

APPENDIX

Section: Interaction

This section will ask you about your opinion on how you satisfy with the implementation of BL in terms of interaction.

| Satisfaction Domain | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|-------------------|----------|----------|----------|----------------|
| Interaction | 1 | 2 | 3 | 4 | 5 |
| A blended learning session keeps me always alert and focused. | | | | | |
| Interaction is able to maintain with the lecturer even not in class session. | | | | | |
| A blended learning course makes it more important for students to visit the lecturer during office hours. | | | | | |
| I am satisfied with the quality of interaction between students and lecturer in blended learning session. | | | | | |
| I am satisfied with the way I interact with other students in blended learning session. | | | | | |
| I am satisfied with my participation in the class in blended learning session. | | | | | |

Section: Instruction

This section will ask you about your opinion on how you satisfy with the implementation of BL in terms of instruction.

| Satisfaction Domain | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|-------------------|----------|----------|----------|----------------|
| Instruction | 1 | 2 | 3 | 4 | 5 |
| The use of blended learning technology in this course encourages me to learn independently. | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| My performance in exams is improved when using BL compared to similar courses I studied before. | | | | | |
| I believe I will be satisfied with my final grade in the course. | | | | | |
| I am satisfied with how I am able to apply what I have learned in this course. | | | | | |
| I am satisfied enough with the implementation of BL to recommend it to others. | | | | | |
| Compared to face-to-face course settings, I am less satisfied with BL experience. | | | | | |
| I enjoy working on assignments by myself. | | | | | |

Section: Instructor

This section will ask you about your opinion on how you satisfy with the implementation of BL in terms of instructor.

| Satisfaction Domain | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|-------------------|----------|----------|----------|----------------|
| Instructor | 1 | 2 | 3 | 4 | 5 |
| The instructor makes me feel that I am a true member of the class. | | | | | |
| I am satisfied with the availability of the instructor(lecturer). | | | | | |
| The instructor uses blended learning technology appropriately. | | | | | |
| I understand the assignments given by the instructor(lecturer). | | | | | |
| Feedback on evaluation of tests and other assignments was given in a timely manner. | | | | | |
| The instructor(lecturer) give enough time for students to complete the given assignments. | | | | | |

Section: Course Management

This section will ask you about your opinion on how you satisfy with the implementation of BL in terms of course management.

| Satisfaction Domain | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|-------------------|----------|----------|----------|----------------|
| Course Management | 1 | 2 | 3 | 4 | 5 |
| Discipline is highly observed when the lecturer is not even in the class session. | | | | | |
| The lecturer/supervisor always takes attendance. | | | | | |
| Using blended learning was an effective way to learn about the assigned topics. | | | | | |
| Applying blended learning increase my understanding towards the course that I attend. | | | | | |
| Learning activities and assignments of this course by using blended learning meet my learning expectations. | | | | | |

Section: Technology

This section will ask you about your opinion on how you satisfy with the implementation of BL in terms of technology.

| Satisfaction Domain | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|---|-------------------|----------|----------|----------|----------------|
| Technology | 1 | 2 | 3 | 4 | 5 |
| The content given is clear and comprehensive when the lecturer is not even in the class session. | | | | | |
| Technical problems are not frequent, and they do not adversely affect my understanding of the course. | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| The technology used for blended teaching is reliable. | | | | | |
| Better accessibility of educational materials. | | | | | |
| Faster and better access to information. | | | | | |