

# EXAMINING STUDENTS' SATISFACTION WITH ONLINE LEARNING ACTIVITIES IN BLENDED LEARNING COURSE: A CASE STUDY

Viet Anh Nguyen

*University of Engineering and Technology, Vietnam National University Hanoi (VIETNAM)*

## Abstract

This paper aims to explore factors affecting student's satisfaction when the students participate in online learning activities of blended learning courses. The factors are considered in the aspect of the interaction between teachers and students, and the interaction among students. In the paper, we proposed a course model with many interactive activities via LMS Moodle. The students participated in the course in the form of face-to-face learning combined with videoconference and implemented other learning activities such as discussions, homework, test and online assessment. We conducted a survey of 107 students by asking them a questionnaire, in which each question has 5 points on Likert scale with ranges from 1 (very unlikely) to 5 (very likely). The questions helped to investigate the following factors: Interaction, Collaboration, Communication, Assessment, and Results. In addition, variables of the student's background were considered such as core competencies, online spending times. The results showed that the students were excited and felt very comfortable when they implemented learning activities. And we also found that the interaction, collaboration, and assessment could become good predictors of the student's satisfaction.

Keywords: blended-learning, learning activities, student's satisfaction.

## 1 INTRODUCTION

The organization of teaching in the form of integrated learning Blended Learning (BL) is the inevitable trend in education and training. Guzer Bayram and his colleagues have identified: "Blended learning have been become the center of attention at the beginning of the 2000 as an eclectic approach while scholars are debating on the best environment for students. In blended learning, the main idea is to benefit on good sides of both approaches"[1]. BL is the coordination of the content, methods, and ways of teaching in different forms of learning to optimize the strengths of each form, ensuring to achieve the highest effectiveness of education. BL courses help students to study more actively through two interaction ways: among students to learn from each other, between students and teachers through direct guidance of teachers in offline and online learning.

One of the criteria for evaluating the effective deployment of BL model is the satisfaction of participants [2]. Up to now, there have been many studies on the level of student satisfaction with the BL course on many different factors such as technology, instruction, learner, teacher, course, system [3], student motivation [4], collaborative learning [5]. In this study, we focus on evaluating the satisfaction of students in the aspects of the interaction between teachers and students, the interaction among the students to participate in online learning activities in the BL course.

### 1.1 Student Satisfaction

Satisfaction can be interpreted as "a concept that reflects outcomes and reciprocity that occur between students and an instructor"[6]. Learner satisfaction is one of the important bases for assessing the success and effectiveness of a course. However, currently, there are not many kind of research that can point out the criteria as a basis for evaluation of satisfaction. Some recent studies have suggested some evaluation criterion. Wu's and his colleague's research [7] have shown that performance expectations and learning climate are two important factors to assess the learners' satisfaction.

Mahmoud et al.[2] proposed criteria such as instructor, technology, class management, interaction, and instruction to consider the quality of the BL course. Learning environments create favorable conditions for student's teamwork, the collaboration with each other becomes a factor that promotes learner's participation in the course. Zhu's research [8] indicated that the feel of student's satisfaction and their performance in an online collaborative learning is the key factor in determining whether online learning model can be sustainably used or not. Studying the factors affecting student

satisfaction when participating in online training program, the results of Kuo and colleagues demonstrated a close relationship between learner's satisfaction with the factors such as learner-instructor interaction, learner-content interaction, and Internet self-efficacy [9].

## **1.2 Blended Learning**

BL model combines traditional teaching methods, teaching facilities and computer-based learning to improve the effectiveness of learning activities. So in researching BL model, the methodology of designing modeled courses and how to build, deploy BL courses are necessary for the current period. It is also especially necessary in the courses that have the support of information technology in the expression of content and learning activities through interaction with students such as simulations, virtual experiments.

BL aims to take advantages of traditional teaching of online learning to promote the effectiveness of teaching and learning of both students and teachers. BL helps students to have more learning experience: Taking advantages of technology, allowing students to learn at their speed, using the preferred learning methods, and receiving regular and timely feedback about the activities that they involved.

## **1.3 Research Context**

UET is a public four-year university specializing in technology with the following primary majors: Information Technology, Electronics and Telecommunications, Engineering Physics and Nanotechnology, and Engineering Mechanics and Automation. Each year, 550 specialized courses are available for about 2500 students to select. In recent years, UET has been more interested in BL courses; there were about 442 courses (~20%) in the Information Technology and Electronics and Telecommunications major that applied the teaching/learning process in the form of BL. Although there were many difficulties in the application process, the initial results proved that the BL approach can be expanded to all the courses in the university. UET considers the BL courses to be the combination of two teaching methods: face-to-face learning and e-learning. Students continue to participate in weekly traditional face-to-face courses and must satisfy all teachers' requirements for courses interacting with the LMS system.

Currently, some new courses have only used limited tools to support teaching activities such as updated content: textbook, handout, slides, and several discussion forums. To promote the implementation of effective BL course, we designed some courses as templates to provide many online interactive learning activities. The evaluation at the end of the course is the foundation for replication of the model in the future.

## **1.4 Purpose of the Study**

The purpose of this study is to: (1) Design a model of blended learning course with many interactive activities between teachers and students, among students; (2) Identify the factors that affect the degree of satisfaction of students for group activities; (3) Evaluate the level of satisfaction of the students taking part in online learning activities in blended learning courses.

## **1.5 Research Questions**

This study was conducted to answer the following questions: (1) Whether the factors such as Interaction, Collaboration, Assessment, Technology, and Results were good predictors of the satisfaction of students with learning activities in blended learning course or not (2) Is there a relationship of these factors in the assessment of student satisfaction with the learning activities? (3) How does student's background affect the following factors: Interaction, Collaboration, Assessment, Technology, Results?

## **2 RESEARCH MODEL AND HYPOTHESES**

Based on the model of the proposed research, hypotheses are formed as follows:

Interaction: This factor considers the influence of interactive activities between teachers and students, the interaction among the students. The interaction between teachers and students plays a major role in the BL course, especially in online learning activities. The role of the teacher in the instructional

practice, communication, and supervision affects learner satisfaction. Besides, the effectiveness of interaction among the students participating in group activities of courses also affects the satisfaction of learners.

*H1: The effective interaction between teachers and students, among students in the classroom, brings satisfaction to learners and vice versa.*

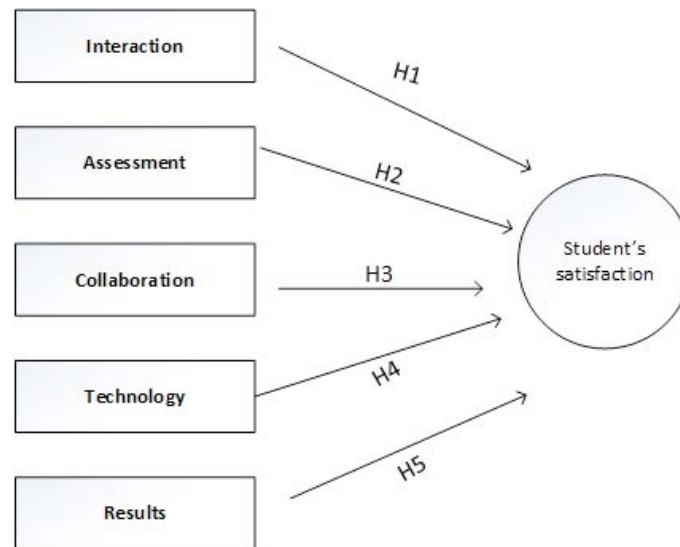


Figure 1. Research model and hypotheses

**Assessment:** One of the important steps of the learning process is to assess the learner. The true assessment of learners at the end of a course affects their satisfaction. Evaluation of test activities is appropriate for course content and the ability of the students. The deployed evaluation forms also affect the promotion of learner participation, encouraging students to learn. How to combine assessment forms such as self-assessment, peer group assessment, peer evaluation in BL courses in order to make them more efficient and exciting for students is a matter of concern.

*H2: Student's satisfaction with a course that uses a variety of assessment forms to promote, encourage learners to participate in learning activities and vice versa.*

**Collaboration:** This factor considers the impact of collaborative activities among students in the implementation of learning activities on the satisfaction of learners. The deployment of group learning in courses at the higher level of education is essential. Work in a team helps students to promote their skills: discussion, collaboration, scheduling, assigning works, communication. Besides, learners' satisfaction also is reflected in the ability of comfortable support and efficient tools for online teamwork environment.

*H3: Using the effective collaborative learning activities in group brings satisfaction to the participants and vice versa*

**Technology:** Technology is one of the important factors for effective deployment of BL courses. Many of the learning activities are deployed based on the supporting tools. Smooth learning process during the entire course depends on the communications infrastructure: the student will not be satisfied with the course if the offline status occurs frequently. For those students who need supports in the learning process, technical staffs are required.

*H4: Learning activities environment which was easy, quickly, reliably deployed, brings satisfaction and vice versa.*

**Results:** Learners are interested in learning outcomes while they participate in the course. Here, the result can be understood in two aspects: First, it is the evaluation score of the teachers when students completed coursework. May these results underestimate the level of the students or not? The result as expected by learners or not? Those questions are factors affecting learner's satisfaction. The second is the knowledge and skills that learners perceived after the course. The skills and expertise are not to be quantified; they are only felt by the students after completing the course. These factors also affect the learners' satisfaction of results.

*H5: The usefully obtained results affect learner's satisfaction.*

Beside the above assumptions related to the learner' satisfaction for learning activities in the BL course, factors such as background, time used for online learning by learners are also reviewed.

### **3 METHOD**

#### **3.1 Sample**

The experimental course was conducted for the third and fourth-year students in the information technology. The course took place over a period of 15 weeks. Registered students for the course needed to follow the schedule including participation in learning activities, class discussions in traditional forms (face to face), and implementation of designed online learning activities. 107 students were surveyed after the end of the course through the questionnaire with questions on a Likert scale.

#### **3.2 Designs and Procedures**

In this study, we considered a course in the form of BL through the combination of traditional teaching methods and online activities using supporting tools and Learning Management System. We designed two learning activities types of interaction: interaction between teacher and students, the interaction among the students.

##### *3.2.1 Interactive learning activities between teacher and students*

###### *Online learning*

Beside the teaching activities in the form of F2F in the classroom, teachers also spent a certain amount of time for online teaching activities. In the model, we used BigBlueButton tool [10] which was integrated with Moodle LMS systems to implement the online course. For this activity, interactive activities between teacher and students focused on answering question issues related to projects, assignments. In working time, students could use the "raise my hand" function to express their opinions directly. In the experiment course, the online teaching activities focused on guiding students to use frameworks for developing web applications.

###### *Online question & answer system*

In the teaching process, teachers need to understand the student's feedback about the learning section. During the period of an online learning section, the teacher cannot answer all the questions of the students, so many students who want to ask or demand the response will not be answered. Also, to fully collect honest feedbacks from students is not easy because not all of their problems will be responded to the teacher if their identification is clear. So that we built a tool that allows students to ask questions while they are participating in an online learning section. With this software, students easily ask questions, submit their feedback in an anonymous state to their teacher who is teaching online. The issue is shown in public for all students who are participating in the online learning session; the members can vote for interesting or the most concerned questions. The teacher does not need to answer all the questions; he can select to answer the most concerned questions.

##### *3.2.2 Interactive learning activities among students*

The implemented interactive learning activities among students in the course were: Group exercise, Wiki document, peer group assessment, forums.

###### *Group assignment activities*

The students selected the other members in the class to form working groups at the beginning of the course. As for students who could not form the working groups themselves, teachers randomly assigned students into different groups. These groups remained stable until the end of the course. The teacher announced the content and requirements of group exercises for teams to select to conduct during the course progress. In our experiment, each group consisted of 5 to 6 students, each group must do at least three group exercises to complete the course.

###### *Peer group assessment activities*

Exercises are implemented by groups. Each group of 5 to 6 members needs to select a project, its execution time is approximately four to five weeks. Project performance evaluation is conducted

through three phases: (1) The members of the group perform a self-assessment based on their level of contribution to the group work, the members of the group will carry out the self-classification levels A, B, C, D respectively. (2) The groups will discuss and conclude a final assessment for each member of the group, with the consensus of the whole group through the minutes of the discussions, with each member's certification.

The result of peer assessment is considered as valid if each student of the group has different levels of evaluation. It can be understood that it is not acceptable if a group has the same assessment level at A, B, C or D for its members. This is quite natural because almost there are not equal contributions of all members for the group work. (3) Results of group exercises are reported offline in the class, where teacher evaluates their project performance by giving scores with the criteria outlined in the project requirements. The students of the other groups will fill out a rating list of the groups after hearing all presentations.

#### *Wiki activities*

This activity is implemented by groups. The groups write a document to study about the specific content of the course. Members of the group work together to build the document that will be evaluated by the teacher and other groups in the class. This activity uses the Moodle workshop tool allowing students to participate online and to see the process of doing their group's exercise from the start until the finish. In the experimental course, we asked groups of students to write a studying document about a framework for developing Web-based applications.

#### *Forum activities*

Each course has a forum for students to exchange related matters of the course. It is also a place where the official information is exchanged between students and teachers and among students on course issues. Level of forum participation is a criterion to assess the student's attendance level.

### **3.3 Instrument**

At the end of the course, students will answer a questionnaire of 32 questions (Appendix) divided into six groups to evaluate the satisfaction level of students for following aspects: Interaction, Collaboration, Assessment, Technology, and Results. The level of satisfaction is evaluated according to the Likert scale of five levels, with the 1st level equivalent to strong disagree or strong dissatisfied, 5th level equivalent to strong agree or strongly satisfied.

## **4 RESULT**

### **4.1 Descriptive Analysis Variables**

Statistical results described in Table 1 show that the response of the students was positive for the observed variables. The result of the survey on interaction factor shows that most students were interested in online teaching via video conference, in which they could exchange directly with the teacher via video conference. The teacher also supports students to perform online learning activities and the use of interactive forms on LMS systems with other class participants.

Exploration results of observed variables for factor "collaboration" show that students agree with forms of group work given by the teacher. A learner is able to select members in the class to collaborate with him, and he also can select a project from a list of topics provided by the teacher. The group members regularly use online tools for work. Exploring collaboration activities to promote student's teamwork, feedback on assessment from students indicates that the majority of students agreed with the assessment of other students in the group on their contribution in the group work.

However, exploration results of student's consensus on the assessment of other participants in the class for the group, which they participated in, have only average values. So it could not indicate that students were satisfied or dissatisfied. The majority of students evaluated that implemented activities encouraged them to learn more actively.

Statistical results, considering the impact of technology factor to satisfaction, indicate that the majority of the feedback was positive on the availability of the system response. Ratio of assessing image quality and sound of the video conference lesson in good quality was at high level. The majority of learners evaluated that it was easy to use interactive supporting tools in group's work.

Feedback from students about results factor showed that the majority of students agreed with the result (in points) of the whole subjects. The proposed evaluation criteria received consensus from the majority. Statistical results showed that students participating in the course believed on the usefulness of the deployed model.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
I1	107	3	5	3,90	,658
I2	107	2	5	3,94	,656
I3	107	3	5	4,12	,655
I4	107	2	5	4,18	,684
I5	107	2	5	3,98	,687
C1	107	3	5	3,58	,659
C2	107	2	5	4,32	,638
C3	107	3	5	4,42	,533
C4	107	3	5	3,93	,683
C5	107	3	5	3,87	,674
A1	107	2	5	4,37	,680
A2	107	1	5	3,63	,694
A3	107	2	5	4,21	,697
A4	107	3	5	3,71	,644
A5	107	2	5	3,94	,642
T1	107	3	5	4,10	,658
T2	107	2	5	3,82	,627
T3	107	2	5	4,15	,684
T4	107	2	5	3,89	,718
T5	107	3	5	4,31	,692
R1	107	3	5	4,26	,619
R2	107	3	5	3,92	,646
R3	107	3	5	4,05	,650
R4	107	2	5	3,87	,660
R5	107	3	5	4,23	,608
O1	107	3	5	4,34	,643
O2	107	3	5	4,22	,663
O3	107	2	5	3,98	,727
O4	107	3	5	4,43	,601
Valid N (listwise)	107				

## 4.2 Correlation analysis results

Table 2 presents pearson correlation analysis results to quantify the level of strict linear relationship between quantitative variables affecting satisfaction.

Table 2. Correlations between independent variables and dependent variables

		Y	x1	x2	x3	x4	x5
Y	Pearson Correlation	1	,765**	,576**	,395**	,618**	,732**
	Sig. (2-tailed)		,000	,000	,000	,000	,005
	N	107	107	107	107	107	107
x1	Pearson Correlation	,765**	1	,431**	,642**	,493**	,719**
	Sig. (2-tailed)	,000		,000	,000	,005	,000
	N	107	107	107	107	107	107
x2	Pearson Correlation	,576**	,431**	1	,680**	,455**	,704**
	Sig. (2-tailed)	,000	,000		,000	,008	,000
	N	107	107	107	107	107	107
x3	Pearson Correlation	,395**	,642**	,680**	1	,685**	,517**
	Sig. (2-tailed)	,000	,000	,000		,000	,000
	N	107	107	107	107	107	107
x4	Pearson Correlation	,618**	,493**	,455**	,685**	1	,611**
	Sig. (2-tailed)	,000	,005	,008	,000		,000
	N	107	107	107	107	107	107
x5	Pearson Correlation	,732**	,719*	,704**	,517**	,611**	1
	Sig. (2-tailed)	,005	,000	,000	,000	,000	
	N	107	107	107	107	107	107

### 4.3 Regression analysis results

The regression analysis results of five quantitative independent variables: Interaction, Collaboration, Assessment, Technology, Results and a dependent variable- Satisfaction. Analysis results show that the independent variables strongly impact on Satisfaction including Interaction, Collaboration and Assessment with the regression coefficients are statistically significant in line with the given assumptions. Technology, Result affected student's satisfaction, however, the statistical results showed that these two factors are not clear indicators.

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
2	,743b	,591	,575	,240	
3	,673c	,524	,501	,342	1,395

## 5 DISCUSSION

The purpose of this study is to identify the factors that affect the degree of satisfaction of students for group activities. This model examines the factors affecting satisfaction based on research results of Kuo [11], with an approach that focuses on the learners' satisfaction when they are participating in online learning activities through the addition and considering factors related to the interaction, collaboration, assessment, technology, and results. The design of content and learning activities in the BL courses plays an important role in promoting the interaction between teachers and students. The results of recent studies showed that the course with diversified design in content and form encourages students to interact with the system [12]. Providing activities such as online question and answer, group exercises, peer group assessment, wiki documentation construction will facilitate learners to understand the course content better [13]–[15].

Contrary to the Kou and his colleague's judgment [11] suggesting that the interaction of students with each other did not affect student satisfaction, our research indicates that collaboration among the

students through the learning activities is one of the factors that influence their satisfaction with the online course. This result is consistent with research by Zhu [8]. This result can be explained by our proposed model: the interactive activities, group work among students is a necessary task that almost learners need to involve in order to complete the course. Also, the collaboration among the students helps them to improve their other skills.

Considering the evaluation factors, the survey results showed that students are satisfied with the used evaluation form. The group assignment and peer group assessment created transparency positively promoted self-study and active participation in the work of the group. Why could this approach promote learning endeavor of individuals? It is reasonable because if each member of the group has the same evaluation result, it will not help to promote the learning endeavor of each individual because more or less contribution in group's work receives the same results. With several stages assessments, individuals who can contribute significantly to the overall work will be recognized. Evaluation in the formative assessment form will facilitate learner's initiative and efforts to achieve the possible best results, because, at each stage, the results of the component assessment will become indicators that help learners to know their knowledge level on the subject. The exploration results showed that, almost students were satisfied with forms of exams used during the course. They also were satisfied with evaluation results of teachers and claimed that the evaluation forms encouraged them to learn more actively.

Technical infrastructure and communication play an important role for the implementation of courses in the online form [2]. The issues concerned by the learners often relate to the convenience and easy use of the system, or whether its tools support well in the operation of the online course or not, whether the communications infrastructure quality affects sound quality and image of the interactive online activities or not. Exploration results show that technological factors have no major impact on the satisfaction of learners, but the learners will be satisfied when they can use the learning environment with maximum support of the technology.

A common question for students after the course is whether they are satisfied with the learning outcomes or not? Learning outcomes are often seen as a criterion for evaluating the results obtained after the end of the course [16]. In this study, we study learning outcomes obtained by students in order to survey the student's satisfaction level in following aspects: Firstly, whether students agree with the assessment results or not. Secondly, the test evaluation is appropriate for students or not. The third, whether students accumulate knowledge or other skills such as teamwork skills, planning skills, assignments or not. Obtained survey results showed that most students having good results usually give positive feedback and vice versa, and this criterion does not play a significant role in the student satisfaction assessment.

In this study, we also conducted a review of the impact of qualitative variables such as level of education, duration of studying online on the satisfaction. The results showed that level of education did not have much impact on satisfaction. It can be explained because the selection of the third and fourth year students resulted in some similarities. The students who spent more time participating in the system with ranges from thirty minutes to one hours per day seemed to be more satisfied with online activities. This result confirms the results of the study by Kuo [11]. Why the students who spent less or more time to study than ranges from one to three hours per day, were not satisfied with the course in comparison with the group of students who spent time to study in about one hour? It can be explained that students, who do not spend enough normal studying time, will not be able to complete full course requirements. And other students, who spend too much time in interacting with the system, have problems in interacting with the course instead of learning the course deeply.

The obtained research results were positive, however, the study had some limitations as well. Firstly, the number of implemented courses as well as the number of collected samples was small. The study focused on students having the same quality so that the survey results could not collect feedbacks from different learners. Secondly, to design the course with many interactive activities such as testing courses, it requires more efforts of teachers and course designers to convert the learning content in traditional approach to the learning activities in an online environment. Furthermore, in interactive courses, teachers have to spend more time for teaching activities as well as supervision.

## **6 CONCLUSION**

Student's satisfaction when they participate in BL courses is one of the factors for evaluating the effectiveness. There are many factors used to determine the level of student's satisfaction. In this



study, we propose the following criteria for evaluating the satisfaction of students with online learning activities: Interaction, Collaboration, Assessment, Technology and Result. The results showed that the factors: Interaction, Collaboration and Assessment have a significant influence on the learners' satisfaction. Designing BL courses with many learning activities created excitement and promoted learners' active participation to bring satisfaction. To do this, teachers and course designers must focus on building interactive learning activities; learning content requires the contribution of the whole group. Assessment activity should incorporate a variety of formats to evaluate the true capabilities of the learners. We proposed a BL course model as a hint to the course designers for building a course with rich online learning activities. In this model, we have developed two online interactive activities between teachers and students: videoconference, question and answer; the interactive learning activities among students: group assignment, peer group assessment, wiki, forum.

The purpose of this study is to provide a solution supporting teachers and designers to build the BL model courses. Especially, the courses in the form of based learning project, are ones that focus on the ability of teamwork, cooperation and exchange among members through a variety of learning activities, collaborative activities, examination and evaluation designed in the online learning. Also, the research promotes the use of the courses that focus on improving the skills of teamwork, cooperation and exchange between the participating students - this is the weak skill of the majority of students.

Research results have indicated that the effective interaction among the students in the BL courses created the satisfaction for learners. Courses with diversified assessment forms promoted active participation of learners in learning activities. Using the favorable and effective collaborative learning activities in the group brought the satisfaction to learners. Although the obtained results from application of a small scale, the model can be considered as a suggestion for teachers and designers in construction and teaching organization.

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