Integration of LMS to Support Student Learning: A Case Study

Anchalee Chayanuvat[1*] and Paweena Sujaritthanarak [2]

[1] Faculty of Education, Rangsit University, Thailand
[2] RSU Cyber University, Rangsit University, Thailand
*Corresponding author, e-mail: shimingwang713@gmail.com

Abstract

Currently, digital learning influences the way heavy content courses are delivered to students. The traditional class may now be at a disadvantage in terms of student motivation. This study was aimed at studying how integration of LMS into a master's degree course to support student learning benefited stakeholders. The research objectives were 1) to identify the extent of LMS support towards student learning 2) to study the reflections of all stakeholders: the lecturer, the Cyber U Representative and the students and 3) to assess the students' satisfaction level of the course. The data were collected in four sets: Reflections of the lecturer, Observations of the Cyber U Representative, Reflections of the Students as well as their Responses to the Satisfaction Questionnaire. Most of the collected data were qualitative and content analysis was used to categorize into emerging themes based on interpretations derived, while the questionnaire provided quantitative data for analysis. The findings revealed that all research participants were satisfied with how the course was delivered with suggestions for improvement and that the course was on the right track to cater for individual differences, digital native needs and closer teacher-student relationship.

Keywords: *digital learning, integration of LMS into a course, coping with individual differences, teacher-student relationship*

1. Introduction

Digital technologies have become part of our modern day life and significantly enhance the potential of society. Thus, no country remains idle at the face of the changes. When information and communication technology is integrated into education, the country is expected to have a high competitive edge. A few theories have emerged to explain the changes brought by digital technologies. They are listed as follows:

1.1 The Theory of Connectivism

Connectivism (Siemens, 2005) is the learning theory for the digital age. It explains how people, organization and technology can collaboratively construct knowledge. Starkey (2012) claims that "knowledge is created through connections and learning occurs through the networks to which learners belong." The idea of using LMS to connect both the lecturer and the students, therefore, can be said to be an embodiment of Connectivism, which is infiltrating the way we live now.

Digital technologies are being used in schools and have been since 1980's (Starkey, 2012). The university, where the study was conducted, is the same as other educational institutes that use information technology to support learning. Information technology has been integrated into teaching and learning since 2005 by adopting e-Learning in the general education courses. Since then, the University has developed an information technology system for use in teaching and learning. In the first semester of 2017, Blended Learning was aimed to be the teaching format focus of General Education and other prototype courses. That is why EDC 608 Research Methodology in Education for master's students of the Faculty of Education was piloted to find out how benefits from the Learning Management System (LMS) could be maximized, especially when traditional classroom learning with online learning was combined with Cyber U LMS. LMS or Learning Management System is a centralized learning management program for management and support of learning management that utilizes Internet technology to manage the interaction between the instructor and the learners, the learners with the learners and the learners with resources. This system helps the learners and the instructor to easily access the content by using management tools for learning improvement, backup, control, information support, student record and evaluation including student grading (Klaisang & Koraneekit, 2009).

1.2 Blended Learning/Flipped Learning

Blended learning is a web-based instructional activity that integrates traditional classroom teaching by using the features of the tool on the website to help improve the learning experience by allowing some time that the learner and the instructor need to spend in the classroom to self-learning on the web (Driscoll, 2002). Blended learning or flipped learning is often referred to when the active elements of class were integrated with face-to-face teaching and learning. Savin-Baden (2015) says:-

Flipped learning is a form of blended learning in which students learn new content on-line by watching video-lectures, usually at home. What used to be homework (assigned problems) is now done in class, with teachers offering more personalized guidance and interaction with students, instead of lecturing.

In brief, the use of getting students to access some materials online enables students to learn at their own paces. Similarly, Barnum and Paarmann (2002) proposed 4 components of Blended learning as a system of transferring information on the web, face-to-face processing with face-to-face activities negotiated in class, creating deliverables or providing availability of channels of information access on the web and collaborative extension of learning together even outside class. Learning connections beyond the physical classroom environment can be easily facilitated with the on-line platforms available.

1.3 Related Research Findings

Dziuban et al. (2004) studied the effects of using blended learning in higher education at the University of Central Florida and found that blended learning could enhance student achievement and student satisfaction in comparison to traditional classroom or full-time online learning. This is consistent with the results of Sharpe et al. (2006) on the effects of using blended learning at the undergraduate level of Oxford Brookes University students. It was found that the students received a very positive response by online tutoring, which supported traditional classroom learning. The students used the resources of electronic learning on a regular basis and reported problems of access to online lessons. Most importantly, the learners accepted and appreciated the combination between face-to-face lessons and technology to support learning activities.

Designing a course which is new knowledge for students is not easy, especially when its course content is complicated and not easy to grasp if there are several theories for them to master and if students have never learned those theories through 'hands-on' experience before. The course under discussion is EDC 608 Research Methodology in Education, which is aimed at serving students at the Graduate level with the following objectives:

1. Support students in developing a friendly attitude towards "research
2. Demonstrate the scientific quality of "research"
3. Expose students to the main strands of 'research" that are commonly used: quantitative research, qualitative research and mixed methods research as well as action research
4. Enhance students' understanding of research in second language education
5. Train students in writing research proposals in education
6. Prepare students for conducting future research work and using the research findings to improve teaching and learning

Research is often an unfriendly term for many people. Most people do not like it much as it embodies complex rituals for those unfamiliar with research (Christensen, Johnson, & Turner, 2015; Burns, 2000; Yates, 2004). For students who just graduated with a bachelor's degree, the concept is often too far-fetched. It looks like there are many new terms that specifically belong to the field such as background of the Study, Statement of the Problem, Quantitative and Qualitative Research, Mixed methods, Literature Review, Data Collection, Data analysis and Instruments. When 'interviewing' (Merriam, 1988; Kvale, 1996) is used as a data collection technique, doubt will be on what kind of conversation should be utilized in order to get the data wished for. What are the characteristics of an ideal interviewer? For course delivery, the teacher is always advised that teaching does not equal learning (Ormrod, 1996). Besides, the lecturer should not spend the whole time lecturing as it will make the course boring and turn students into a sleepy mode. Students have to clearly manifest ownership of their knowledge (Dornyei, 2001; Mezirow et al., 2000). Phanich (1999) did caution teachers years ago that the focus on teaching would not be as effective as

that on learning, so teachers should teach less and let students learn by themselves more to uphold the ideology of Student-Centred Learning.

Undoubtedly, in a course like this, the lecturer cannot avoid transferring knowledge to the course participants but how to reduce the amount of information transfer is a problem. In other words, in what way knowledge delivery will be most effective? Should I teach all the details or should I not is bothering most lecturers if they have such a course. The question that comes up is "Will students understand everything I teach?" Past experience of the lecturer is that students confessed at the end of the course that they only came to understand how to do research at the last session of the course. One common feedback that startles the lecturer is:-

"Dear Teacher,

I came to understand the course only on the last day before the oral presentation exam."

Naturally, as this course was being designed, the lecturer thought about efficiency and effectiveness as the goal was to help students master the concepts of research. With this in mind, the course was designed as an LMS course. It was decided that instructional technology had a very important role to play here. That is why it was necessary to call for help from the Cyber U Team of Research University to make sure that the course would be enjoyable by all. That expectation arose from the fact that being born into the digital world, most students now have developed sufficient digital fluency (Savin-Baden, 2015). Starkey (2012) is convinced that "digital innovations provide communication tools, electronic evidence management and analyses systems and will continue to be developed to enable and enhance the process of teaching and learning." Therefore, to integrate digital learning into traditional classroom teaching and learning was certain to have educational benefits.

This study was initiated because it would be useful for the course lecturer and the Cyber U Team to learn how they could collaborate with each other to produce a course that was user friendly and for the lecturer to proudly say that her teaching paradigm already shifted from the unwanted single "Traditional" mode to the diverse fashionable "Active Learning" Mode to suit the needs of students in this digital age.

2. Objectives

1. To identify the extent of LMS support towards student learning
2. To study the reflections of all stakeholders: the lecturer, the Cyber U Representative and the students
3. To assess the students' satisfaction level of the course

3. Materials and Methods

The research site was a university in Pathum Thani, Thailand. The researchers (the teacher and an IT member of staff) collected data from 11 students enrolled in the course. All eleven of them are school teachers and had heard about classroom-based research but never had hands-on experience in doing research. The time of the study was November 2017-February 2018.

The study was designed as a case study to examine in depth the design of a particular course, a program, event, activity, process or one or more individual (Bogdan & Biklen, 1982; Stake, 1995; Yin, 2009; Hamilton & Corbett-Whittier, 2013). The data were collected from reflections given by the lecturer, a Cyber U Representative and 11 students together with a satisfaction questionnaire for the students. The data from reflections of all stakeholders (the lecturer, the Cyber U Representative and 11 students) were categories into themes which were grouped together based on similarities and emerging patterns. Reflections on what was seen, observed, felt, liked, disliked and most impressed as well as most thought provoking) were recorded in the form of field notes (about one page) at the end of each module (5 in all). The data from the satisfaction questionnaire in the Likert scale format were analyzed quantitatively while responses from the open-ended question were analyzed by grouping the same ideas that were expressed together into themes. These emerging themes were based on the researchers' understanding and interpretation of the situations in the class as both researchers were considered "insiders" (Goetz & Le

Compte, 1984; Stake, 1995). The questionnaire consisted of three parts: Part 1 General information of the respondents, Part 2 Level of satisfaction with Cyber U LMS and Part 3 Open-ended question-Problems, obstacles and suggestions. The questionnaire was done online.

4. Results and Discussion

This study has four sets of data, which provide information in response to the research main question:

1. Reflections from the lecturer
2. Observations and reflections of the Cyber U representative
3. Reflections from the students
4. Responses of student satisfaction from questionnaire of the course

The findings are presented as follows:

1) Reflections from the lecturer

The lecturer kept a book of teaching notes to record what happened and how she felt after teaching each module. The notes were analyzed and the following topics were extracted:

1.1 The following advantages were found:

Course Material Management Flexibility

For the lecturer, course material management was much easier with the support of LMS because she could plan everything that she would like the students to read, be it a Power Point or a clip from YouTube or an article. All the materials would remain there for students. They could access them any time they wish to and if they did not understand any parts of the lesson/course, they could practice again and again without feeling worried about not being able to catch up with the lessons or the speed of the classmates. They could access the materials while in class as the lecturer was dealing with that part of the lesson.

Getting away from Lecturing

Many people may think that IT is the teacher's foe more than a friend because it may take the place of the teacher and activities in class may become meaningless for students. This is a misconception. In fact, integration of LMS into a lesson did not do away with class interaction. On the other hand, all activities could be recorded and kept there for further revision. An oral presentation in an ordinary class could be best recorded by a stand-alone video-taping but with LMS, it can be kept as part of the lesson. A virtual learning environment in the digital age will eventually have open boundaries and different spaces for the types of learning interactions (Starkey, 2012).

1.2 Class Size

If a class is too big, student participation (record of students' active participation such as an oral presentation of an assigned topic of an individual student) may not be easily recorded.

The lecturer was happy that she could design her course as a Blended Learning course with support of LMS. That made her face-to-face teaching of a complex content-orientated more effective as the precious class time was efficiently spent.

2) Observations and Reflections from the Cyber U Representative

The observations and reflections on the part of the Cyber U Representative were interpreted and grouped based on three significant keywords: enthusiastically participating using the LMS System in and outside class, willingly and actively learning with eagerness and the sense of learning ownership. Observing how graduate students in EDC 608: Research Methodology in Education learned revealed that by uploading the course content to the Cyber U LMS before class, students could study in advance before teaching and students could also read the slides to follow the lecturer in class again from their own devices such as notebooks, smartphones or tablets. For the quizzes or assignments, the lecturer could quickly create them on Cyber U LMS, so students could answer or work as instructed immediately in class. This is consistent with the Flipped Classroom learning model that encourages learners to become active learners by studying the assignments from home and spending most of the class time presenting and exchanging ideas.

From the observation, it was found that students' behaviour changed to active learning from their enthusiasm in uploading content to the Cyber U LMS before class. Students studied in advance before

teaching and followed the slides together with the lecturer in class from their own devices such as notebooks, smartphones or tablets. For a quiz or a class assignment, the lecturer created one quickly through Cyber U LMS so students could answer or work as instructed immediately in class. This is consistent with the concept of Flipped learning model that encourages learners to become active learners. It was clearly seen that the students were motivated and cooperated very well in doing activities through Cyber U LMS. If they did not understand anything or could not access the system, they would ask immediately and did a quiz in the Cyber U LMS before class break.

It can be said with certainty that by designing a class for blended learning or flipped learning, students were the ones to learn. They could not avoid this responsibility. Besides, when they were allowed to access on-line knowledge using ICT gadgets whenever and wherever they wished, they became truly independent learners. Good learners must know how to learn. They should have researching skills, be self-directed, pursue lifelong learning and have the skill of time management (Chayanuvat, 2009).

3) Reflections from the students

At the end of each session, students got a chance to review what they had studied earlier on that day and most voiced their satisfaction of the course. In this way, the lecturer could also evaluate what they had learned, how much they had learned or if what they had learned was right. When LMS was used, all the comments could be recorded and kept for later review. The LMS channel posed itself as a means for communication.

Feedback from Professor was good because I see what went wrong.
(G, Module 1)

The morning presentation was very exciting and I enjoyed a lot because I was trained to think critically and analytically about the research proposal. I have learnt more about doing research from different presenters.
(B, Module 3)

The method of lesson delivery used by Ajarn was very good. We could understand what was actually being taught by Ajarn. I would cooperate with everyone especially our Ajarn to complete this course successfully and hope to learn a lot. I would also promise myself to read more and more books hereafter too.
(K, Module 4)

In addition to their reflections over the lessons, sometimes, questions were posed. Examples were:
As the lesson came towards an end, I got confused with research proposal components. Each presenter has different components arranged differently. Though it differs upon the research methodology, it would be clear if Ajarn could give me the clear one, which component comes first and which comes next?
(A, Module 2)

I am somewhat clear about to research proposal but it would be clearer if Ajarn could revisit how to write Background and Rationale.
(D, Module 2)

I am not very sure about the citations for the references.
(G, Module 3)

4) Responses of student satisfaction from questionnaire of the course

The information from the Student Satisfaction Questionnaire was presented in parts as follows:

Part 1 General Information of the Respondents

Table 1 The respondents' gender

Gender	Number	Percentage
Male	7	63.60
Female	4	36.40
Total	11	100.00

Table 1 shows 63.60% male students and 36.40% female students.

Table 2 The respondents' age group

Age	Number	Percentage
20-30 Y	3	27.30
31-40 Y	8	72.70
Total	11	100.00

Table 2 shows that 72.70 % of the respondents were between 20-30 years old with the rest (30%) between 31-40 years old 27.

Table 3 The respondents' country

Country	Number	Percentage
Bhutan	11	100.00
Total	11	100.00

Table 3 shows that all of the respondents (100%) came from the same country, Bhutan

Table 4 The respondent's career

Career	Number	Percentage
Teacher	11	100.00
Total	11	100.00

Table 4 shows that all of the respondents (100%) were teachers.

Table 5 The respondents' type of device used to access cyber U LMS

Device	Number	Percentage
PC Computer	8	36.36
Notebook	4	18.18
Android Smartphone	8	36.36
iPhone	1	4.55
Android Tablet	1	4.55
Total	22	100.00

According to Table 5, the majority (36.36%) used PC computers and android smartphones, 18.18% used notebooks, while 4.55% used iPhones and android tablets to access Cyber U LMS.

Part 2 Information about satisfaction WITH Cyber U LMS

2.1 Satisfaction with the Cyber U LMS System

Table 6 Means and SD of satisfaction with the Cyber U LMS

Cyber U LMS System	$\bar{x}$	S.D.	Interpretation
easy to access	4.73	0.45	Most
menu is easy to use	4.64	0.64	Most
comprehensive information on demand	4.55	0.50	Most
suitable and beautiful	4.82	0.39	Most
supports a variety of devices	4.64	0.48	Most
Cyber U LMS staff has knowledge and ability to solve problems and clearly recommend how to use the system	4.82	0.39	Most
Total	4.70	0.47	Most

Table 6 shows that respondents chose most "suitable and beautiful' to express their appreciation of the Cyber U LMS and that "staff have knowledge and ability to solve problems and clearly recommend how to use the system" with the mean value of 4.82 and S.D. of 0.39 respectively. The second was "easy to access" represented with the mean and S.D. values of 4.73 and 0.45 respectively and the third were "menu is easy to use and supports a variety of devices" represented through mean and S.D. values of 4.64 and 0.48 respectively. This means that the students were most satisfied with the supportive Cyber ULMS system as well as the friendly and helpful staff.

2.2 Satisfaction from using Cyber U LMS System

Table 7 Means and SD of satisfaction from using Cyber U LMS system

Cyber U LMS System	$\bar{x}$	S.D.	Interpretation
understand the lessons	4.64	0.48	Most
conveniently interact with the instructor	4.64	0.48	Most
quickly do assigned exercises	4.55	0.66	Most
learn or review the lessons anytime and anywhere	4.82	0.57	
active learner	4.64	0.48	Most
interested in learning all the time	4.82	0.39	Most
Total	4.68	0.51	Most

Table 7 shows that the respondents most "learn or review the lessons anytime and anywhere and interested in learning all the time" represented through a mean and S.D. values of 4.82 and 0.57 respectively. The second was "understand the lessons, conveniently interact with the instructor and an active learner" represented through a mean and S.D. values of 4.64 and 0.48 respectively and the third were "quickly do assigned exercises" represented through a mean and S.D. values of 4.55 and 0.66 respectively.

Part 3 Problems, Obstacles and Suggestions

This part of the questionnaire was open-ended offering spaces for the respondents to add information on the problems and obstacles they found and offer suggestions for improvement. The following remarks were found.

Comments on the System/people and Teaching

- I found the system resourceful and can be used for learning and evaluating.
- You were awesome.
- The best way of Teaching and Learning for 21st Century
- Joyful learning
- Everything is good.

Problems

- I would be further useful if we were taught how to look for information.
- Could have been better and easier, if there was a separate orientation on how to use it.

From the open-ended question, it shows that the students were pleased with the course from the comments they gave. However, they would like to have an orientation to the system to train them how to look for information. This is indeed a good suggestion that can be used with the next group.

5. Conclusion and Discussion

In this class, as the data shows, both the lecturer and the students have gained benefits from the LMS system in which knowledge in all formats such as the PowerPoint slides, the online sources of knowledge and homework and assignments can be found on the system. When a topic seems difficult, the students can review it over and over, or classmates can share their understanding with the materials. Thus, learning no longer happens in the class when the lecturer and students meet. The LMS system becomes an active platform for learning. The three groups of people are connected by the Cyber ULMS system. Siemens (2005) believes that "Connectivism presents a model of learning that acknowledges the tectonic shifts in society where learning is no longer an internal, individualistic activity." This study reveals that

more can be done in terms of connectivity through interaction and knowledge construction which is a keyword for learning in the digital age. The LMS system should not be used as a channel for all class stakeholders to communicate in the traditional ways.

According to Savin-Baden (2015), there are four obvious benefits of Blended/ Flipped Learning. First, it increases flexible environments as the teaching and learning spaces. Second, it moves away from teacher-centered classrooms to a student-centered approach. Third, it encourages decisions on the choice of materials to be used and the modes of teaching and learning to adopt. Finally, professionalism is tested and sharpened when the teachers have to decide on what and how material should be taught. From all sets of the data collected, it is apparent that all stakeholders, the lecturer, the Cyber U representative, and the students were satisfied with how the course was delivered. The lecturer was pleased that she could respond to the learning needs of our 'digital native' students. The lecture mode alone would not please them. Simultaneously, students were required to participate actively in all class activities and other on-line assignments. Feeling accommodated with LMS even when students did not understand some parts of the lessons reduced their anxiety. Besides, they could leave their voices on the platform. The Cyber U representative was also pleased that she could see the lessons work out to the expectations. Her observations confirmed that the students worked actively both in the face-to-face lessons and on-line assignments. The most important factor of all for success was the participating students. They enjoyed how they learned. To the lecturer, the best part was all could tell the lecturers what they thought and how they would like to be supported with the help of the system. She could, thus, offer help to individual students with personalized needs. Talking about the Teacher-Student relationship, it looks like the relationship was better than in an ordinary class without the LMS support. Chayanuvat (2009) says:-

> The teacher is expected to demonstrate desirable general warm human qualities, specific personal characteristics such as being caring and nurturing, facilitating and being impartial, accommodating presentation and performance skills, sufficient content knowledge and effective teaching strategies.

To conclude, with integration of LMS, it does not mean that students and teachers are forced to be distant from each other as many may think. In fact, LMS enables the teachers and students work more closely together.

However, some training on how to use the LMS system must be offered before the class begins to facilitate students. A point worth further exploring is probably the class size factor. The class under study was small, so the LMS support was seen in a positive light. What if the class is bigger, will the support be appreciated in the same way?

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7. References

Barnum, C., & Paarmann, W. (2002). *Bringing induction to the teacher: a blended learning model*. T.H.E., J 30:56-64.

Bogdan, R. C., & Biklen, S. K. (1992*). Qualitative research for education: An introduction to theory and methods*, Boston: Allyn & Bacon.

Burns, R. B. (2000). *Introduction to research methods*, Malaysia: Pearson Education Australia.

Chayanuvat, A. (2009). *English learning experiences of students enrolled at a Thai university: a case study*. A thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Education at Charles Sturt University, Bathurst, NSW.

Christensen, L. B., Johnson, R. B., & Turner, L. A. (2015). *Research methods, design and analysis*, England: PearsonEducation Limited.

Dornyei,Z. (2001). *Motivational strategies in the language classroom*. Cambridge University Press: the United Kingdom.

Driscoll, M. (2002). *Web-based training: creating e-learning experiences*. 2nd ed. San Francisco: Jossey-Bass Pfeiffer.

Dziuban, C. D., Hartman, J., Juge, F., & Moskal, P. D. (2004). *Blended learning*. EDUCAUSE Center for Applied Res. (ECAR) Res. Bull., 2004(7), 1-12.

Goetz, & LeCompte (1984). *Ethnography and qualitative design in educational research*, The United States: Academic. Press, Inc.

Hamilton, L., & Corbett-Whittier. (2013). *Using case study in education research*. Singapore: Sage.

Klaisang, J., & Koraneekit, P. (2009). Pedagogy-based hybrid learning: from Concept to Practice. In *Karusart Journal*, Volume 38 No. 1 (July-October, 2009). 93-108.

Kvale, R. (1996). *Interviews*, the United States of America: Sage.

Merriam, S. B. (1988). *Case study research in education*. Oxford: Jossey Bass Ltd.

Mezirow, J. et al. (2000). *Learning as transformation*. the United States of America: Jossey-Bass, Inc.

Ormrod,J.E. (1996). Human Learning, United States: Prentice Hall, Inc.

Phanich, W. (1999). Talk delivered at a gathering of administrators organized by Office of the Higher Education Commission,www.mua.go.th.

Savin-Baden, M. (2015). *Rethinking learning in an Age of Digital Fluency*. London and New York: Routledge.

Sharpe, R., Benfield, G., Roberts, G., & Francis, R. (2006). *The undergraduate experience of blended learning: a review of UK literature and practice*: The Higher Education Academy.

Siemens, G. (2005). *Connectivism: A learning theory for the digital age*. Retrieved from www.connectivism.ca/about. html. (accessed 15 February 2018).

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks. CA: Sage.

Starkey, L. (2012). *Teaching and learning in the digital age*. Great Britain: Routledge.

Yates, L. (2004). *What does good education research look like*?. the United Kingdom: Bell and Brain Ltd., Glasgow.

Yin, R. K. (2009). *Case study research: design and methods*. Thousand oaks, CA: Sage.